



REPAIR PROCEDURE
FOR
DAMAGED DIVINYCELL[®] CORE
IN FIBERGLASS LAMINATES

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REPAIR PROCEDURE FOR DAMAGED DIVINYCELL CORE IN FIBERGLASS LAMINATES

PURPOSE: The purpose of this procedure is to provide a guideline to properly repair Divinycell Cored Fiberglass Laminates.

MATERIALS NEEDED:

- Gel Coat	- Epoxy Adhesive to Bed High Density Divinycell Cores
- Pre-promoted Polyester Resin	- Acetone Solvent
- 1.5 oz. Fiberglass Mat	- Cab-o-sil Filler
- 2415 Fabmat	- 1/8" Chopped Strand Fiberglass
- Divinycell Core to Replace the Density Being Repaired	- MEK Peroxide 50% Clear
- Divilette Polyester Adhesive to Bed Core	- 1/16" Milled Glass Fibers

EQUIPMENT NEEDED:

- Laminating Roller	- Containers for Resin & Gel Coat
- Laminating Brush	- Drill with Counter Sink Attachment
- Putty Knife	- Clean Cloths
- Disc Grinder	- Masking Materials
- 100- & 220-Grit Sandpaper	- Hole Saws
- Solvent Container	

PROCEDURE A: Holes up to 1/4" in Diameter

1. Countersink the hole from the gel coated side of the laminate with the proper size countersink for the hole being repaired. Rough up the surrounding gel coated surface with 220-grit sandpaper. Rough up the inside surface with 100-grit sandpaper (if accessible). Remove dust and particles then solvent wipe area. Allow time for solvent to dry thoroughly. Surfaces must be free of foreign materials.
2. Make a filler putty by using gel coat thickened with Cab-o-sil to a paste-like consistency. Catalyze with MEKP. Using a putty knife, work the putty into the hole from the gel coated side of the laminate until the putty flows out the other side of the hole. Putty is to extend approximately 1/16" above the gel coated surface to allow for shrinkage.
3. If the backside is not accessible, then move on to Step #4. If it is accessible, follow this step: after allowing putty to cure, sand the backside flush then cover the area with one layer of 1.5 oz. mat 3" in diameter and resin. Roll out excess resin and entrapped air with laminating roller.
4. Sand and fair the cured putty on the gel coated surface with 220-grit sandpaper, then finish with normal procedures.

PROCEDURE B: Holes Larger than ¼” up to ½” in Diameter

1. Countersink or taper grind the hole with a grinder on the gel coated side of the laminate. Rough up the surrounding gel coated surface with 220-grit sandpaper. Rough up the area surrounding the inside of the hole with 100-grit sandpaper or with a grinder (if accessible). Remove dust and particles, then solvent wipe the area. Allow time for solvent to dry thoroughly. Surfaces must be free of foreign material.
2. Make a filler putty by using 1/8” chopped fibers mixed in polyester resin to a paste-like consistency. Catalyze with MEKP. Using a putty knife, work the fiber putty into the hole from the gel coated side of the laminate until the putty flows out the inside of the hole. Make putty flush with surface.
3. If the backside is not accessible, then move on to Step #4. If it is, then follow this step: after allowing the putty to cure, sand or grind the backside flush, then cover the area with one layer 2” in diameter of 2415 Fabmat and resin. Roll out excess resin and air with laminating roller.
4. Sand or grind the fiber putty to just below the gel coat surface. Solvent wipe the area then smooth out the surface with gel coat putty (Cab-o-sil and gel coat). Sand and fair the cured putty with 220-grit sandpaper, then finish with normal procedures.

PROCEDURE C: Holes Larger than ½” up to 2” in Diameter that the Backside is NOT Accessible

1. Using a hole saw 2” larger than the hole diameter, carefully cut through the outer laminate and ¾’s of the way into the core. DO NOT cut into the inner skin. Take a sharp chisel and pry out the core and carefully scrape out any traces of the core. Taper grind the edges of the outer laminate and ¼” into the core. Taper should extend ¾” to 1” outside the perimeter of hole saw cut. If possible, taper the hole on the inner skin and sand the exposed area on the inner skin. Rough up gel coated area around hole with 220-grit sandpaper. Solvent wipe entire area. Allow time for solvent to dry thoroughly. Surfaces must be free of any foreign material.
2. Using a core, ¼” thinner than and the same density as the core being replaced, cut a hole from the foam using the same size hole saw as in Step #1. (If the core is 3/8” or thinner, fill the hole solid with layers of 1.5 oz. mat.) Cover the bottom of the hole with one or two layers of 2415 Fabmat depending on the thickness of the inner skin. Cut these pieces the same size as the hole saw. Laminate these pieces in place, being careful not to leave any knots or bumps. Before this cures, bed the core into catalyzed Divilette, forcing Divilette to fill out any seams or holes. Scrape off any excess Divilette with a putty knife. Core should be even with the taper ground into the original core. If core is H130 density or higher, blend in 1/16” milled glass fibers into Divilette 2415 Fabmat and required number of layers of 1.5 oz. mat to bring surface one 1.5 oz. mat layer thicker than the gel coat surface.

3. Grind the cured mat to just below the gel coat surface. Solvent wipe the entire surface, then smooth out the surface with gel coat putty (Cab-o-sil and gel coat). Sand and fair the cured putty with 220-grit sandpaper, then finish with normal procedures.

PROCEDURE D: Holes Larger than ½” up to 2” in Diameter in which the Backside IS Accessible

1. Taper grind the edges of the out laminate and ¼” into the core. Taper should extend ¾” to 1” from the outside perimeter of hole. Grind the backside around the hole, tapering the hole only slightly. Rough up gel coated area around the hole with 220-grit sandpaper. Solvent wipe entire area. Allow time for solvent to dry thoroughly. Surfaces must be free of any foreign material.
2. Cover the backside of hole with 2 layers of 2415 Fabmat 4”–6” in diameter depending on the size of the hole. Cut a piece of the same density foam as being repaired. Cut this piece the same size as the hole and ¼” thinner than the foam being repaired. Bed the core into catalyzed Divilette, forcing the Divilette to fill out any seams or holes. Scrape off any excess Divilette with a putty knife. Core should be even with taper ground in original core. If core is H130 density or higher, blend in 1/16” milled fibers into Divilette 15% by volume. Before Divilette cures, cover area with one 2415 Fabmat and the required number of layers of 1.5 oz. mat to bring surface of patch one 1/5 oz. mat thicker than the gel coat surface.
3. Grind the cured mat to just below the gel surface. Solvent wipe the entire surface, then smooth out the surface with the coat putty (Cab-o-sil and gel coat). Sand and fair the cured putty with 220-grit sandpaper, then finish the normal procedures.

PROCEDURE E: Holes and Damage Larger than 2”

1. Cut out entire damaged area with a jigsaw or similar tool, leaving no softened core or laminate behind. Taper grind edges of hole from the outside to inside layers at approximately a 30° angle. Rough up surrounding gel coat surface with 220-grit sandpaper. Using a knife and a hand chisel, remove the core from the outside perimeter down to the bare fiberglass of the inner skin. This will leave a fiberglass ledge created by the remaining inner skin around the perimeter. Solvent wipe the entire area. Allow time for solvent to dry thoroughly. Surfaces must be free of any foreign material.
2. Secure a piece of heavy cardboard to the inside of the hole with pieces of string or wire tied to a wooden frame straddling the hole. This will be a form to lay up against. Bond the cardboard to the backside of the laminate with epoxy adhesive. When the adhesive cures, cut the strings or wires and remove the wooden frame.

3. Cut 2 pieces of 2415 Fabmat (Note: More 2415 Fabmats may be required if original skins are thicker than prescribed.) the same size or shape as the outside perimeter and two pieces of 1.5 oz. mat the same size and shape as the inside perimeter. Laminate the first Fabmat to the inner ledge and across the cardboard form. While this is still wet, laminate the two (2) mats into the dish created by the inner skin ledge. This will make an even surface to laminate the second Fabmat to while the others are still wet. Make a special effort to smooth out any lumps or bumps. While this is still wet, bed a precut piece of foam of the same density into Divilette. This piece of foam should be ¼" thinner than the foam being replaced. Force the Divilette to fill out any seams or holes. Scrape off any excess Divilette with a putty knife. If core is H130 density or higher, blend in 1/16" milled fibers into Divilette 15% by volume. Before Divilette cures, cover area with one 2415 Fabmat (Note: More 2415 Fabmats may be required if original skins are thicker than prescribed.) and the required number layers of 1.5 oz. mat to bring surface of patch one 1.5 oz. mat thicker than the gel coat surface.
4. Grind the cured mat to just below the gel surface. Solvent wipe the entire surface, then smooth out the surface with gel coat putty (Cab-o-sil and gel coat). Sand and fair with 220-grit sandpaper, then finish with normal procedures.

PROCEDURE F: Damage Where Outside Skin and/or Core are Affected and Inside Skin Remains Intact Including "Blisters" Larger than 3" in Diameter.

1. Grind away all damaged outer skin fiberglass down to the core. Inspect the core for damage. If there is light damage, remove affected areas with a grinder and smooth out core with layers of catalyzed Divilette, and then skip to Step #3 below. If the damage to the core is severe, it is necessary to remove the entire damaged core. This is done with a grinder, a hand chisel and a knife. Care must be taken not to damage inner skin. Taper grind the edge around the perimeter of the hole grinding ¼" into the existing foam. Rough up the gel coat around the damaged area with 220-grit sandpaper. Solvent wipe entire area. Allow time for solvent to dry thoroughly. Surfaces must be free of any foreign material.
2. Cut a piece of the same density foam as being replaced. Cut this piece the same size and shape as the hole and 1/8" thinner than the original thickness. Bed the core into catalyzed Divilette, forcing the Divilette to fill out any seams or holes. Scrape off any excess Divilette with a putty knife. Core should be even with the taper ground in the original core. If core is H130 density or higher, blend in 1/16" milled fibers into Divilette 15% by volume, or use a resin slurry of laminating resin and fumed silica (Cab-o-sil).
3. Within 24 hours of bonding the foam in place with Divilette, cover area with one 2415 Fabmat (Note: More 2415 Fabmats may be required if original skins are thicker than prescribed.) and the required number of layers of 1.50 oz. mat to bring surface of patch one 1.5 oz. mat thicker than the gel coat surface.
4. Grind the cured mat to just below the gel surface. Solvent wipe the entire surface, then smooth out the surface with gel coat putty (Cab-o-sil and gel

coat). Sand and fair with 220-grit sandpaper, then finish with normal procedures.

PROCEDURE G: Small Diameter Blisters Greater than 3”.

Small and larger diameter blisters (Fig. H) are normally caused by entrapped air or contaminants between the core and tool side skin (mold side). As a result you can expect limited success in drilling and resin-injecting the affected area. Sometimes this procedure works if the adhesion level is high enough, usually by using an epoxy, two-part urethane, or methacrylate adhesive. Use of polyester resin is not recommended for this type of blind repair. If possible, determine the cause of the defect that resulted in the blister. If the cause was contamination, it will be necessary to remove the affected skin (Fig. I) and core surface to effect a durable lasting repair, following Procedure F with varying degrees of core removal from Fig. F, are recommended.





