FILON®
HIGH PERFORMANCE PANEL FINISHES

Repair Techniques

PLEASE READ ALL INSTRUCTIONS BEFORE BEGINNING

These guidelines are provided in good faith, but without guarantee. The manufacturer and/or distributor of the product bear no responsibility for actions taken or not taken. There are many nuances of repair techniques that are assumed to be general knowledge; such nuances are not included in these instructions. Rather, these guidelines are strictly recommendations and are not intended to serve as a step-by-step, foolproof repair checklist. Selection of an experienced repair facility is the sole responsibility of the owner.

Since conditions of use are beyond Crane Composites' control, all risks are assumed by the user. Nothing herein shall be construed as a recommendation for uses which infringe on valid patents or as extending a license under valid patents.

If you have any questions about installation or repair techniques for your particular project, please call 1.800.435.0080 or 1.815.467.8600 and ask for Customer Care or e-mail the RV Application Engineer at rvapplicationengineer@cranecomposites.com.

CAUTION: Wearing disposable latex gloves, goggles, and use of an OSHA approved respirator are recommended. Read and follow all manufacturer safety recommendations on labels of materials used for repair. Some materials may be flammable and should be used with caution.

Crane Composites, Inc.
Recreational Vehicle
COLLECTION

Crane Composites RV
Repair Techniques for Filon Panels

Supplies

Paint, Fillers, & Fiberglass

- Polyester resin* *(for rebuilding integrity of sidewall panel)*
- Fiberglass mat *(for rebuilding integrity of sidewall panel)*
- Lacquer thinner* (*for restoring the surface finish)*
- Color matched lacquer/paint* *(for restoring the surface finish)*
- Hand glaze* *(for restoring the surface finish)*
- Sandable primer* *(for paint pen or plastic wrap texturing method)*
- Color matched two-part polyurethane paint* *(for paint pen or plastic wrap texturing method)*
- Two-part spot filler* *(for shallow scratches and pin holes)*
- Glass-filled, low-shrink polyester filler* *(for deep depressions)*
- Acetone or other acceptable cleaning solvent* *(for degreasing and tool clean-up)*
- Acrylic sealer* *(for plastic wrap texturing method)*

General Supplies

- Cellophane film
- Plastic wrap *(for plastic wrap texturing method)*
- Sanding discs — silicone carbide, grits from 60 through 320
- 400 grit pad
- Buffing compound*
- Cups for mixing resin
- Mixing sticks and spreaders
- Utility knife
- Paint brush — 2" disposable
- Masking tape
- Clean rags
- Non-porous surface *(for mixing fillers)*
- Paint pen *(for paint pen texturing method)*

Caution: These materials are flammable. Proper precautions for use must be followed. Read manufacturers' directions carefully before beginning repairs.

Equipment

- Disc sander
- Air compressor
- Two spray guns
- Buffer
- Bench-type work surface

Safety Precautions

1. Protect your eyes with goggles, cover your nose and mouth with OSHA-approved respirator, and wear gloves when cutting and sanding fiberglass and using polyester resin and cleaning solvent.
2. Resins and solvents are highly flammable. Do not smoke or use electric tools that cause sparks. Always read the caution labels on all solvent containers and take the necessary precautions.
3. Make sure the work area is well-ventilated.

Severe Damage Repair Procedure

Deep Gouge or Tear

1. Use a chisel to dig out all broken pieces of Filon skin and lauan.

2. Sand a 2" taper from the inside edge outward all around the lauan on the fiberglass skin. Abrade the Filon surface another 4" to 5" beyond the taper with 120 grit sandpaper to eliminate gloss and assure good adhesion of repair materials.

3. Use coarse, 60 or 80 grit sandpaper and sand away the fiberglass skin. Expose 4" to 6" of lauan backing and remove all traces of bonding adhesive.

4. Blow off all the dust and wipe the area with a clean rag and solvent. Mask the area below the repair to catch any resin run-off.

5. On the work surface, cut a small piece of fiberglass mat into small chunks and set them aside in a mixing cup. Also, cut a piece of 6 oz. fiberglass mat to fit the tapered area. Set it aside.

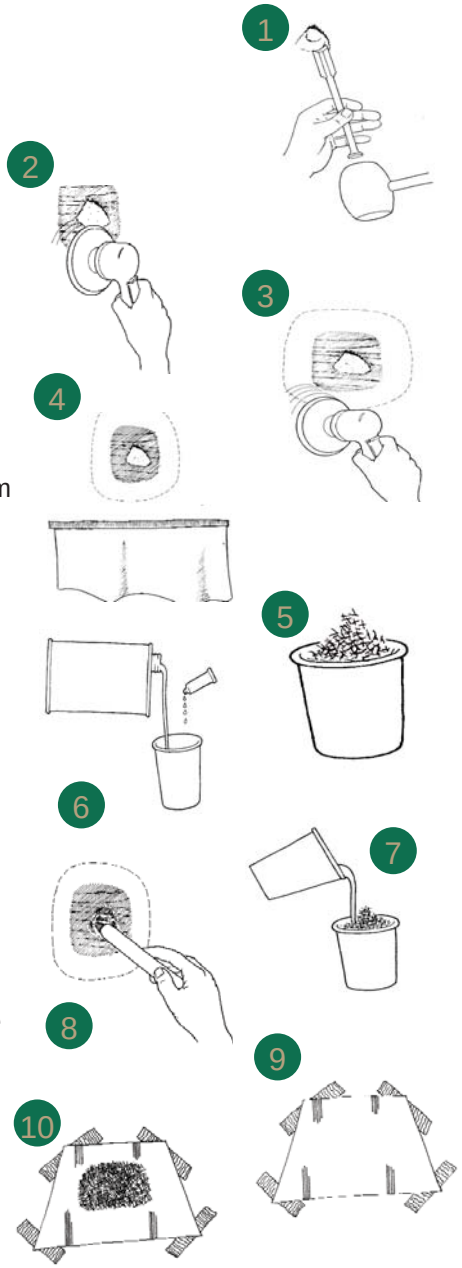
6. Fill a mixing cup with enough polyester resin to saturate the cut mat, plus 1/3 more for the mat in the mixing cup. (6 oz. of resin by volume will saturate 1 sq. ft. of 6 oz. mat.). Add catalyst for 20 to 25 minutes working time. Refer to the resin manufacturer's recommendation for the correct amount.

7. Pour a small amount of catalyzed resin into the mixing cup containing the chopped fibers. Mix thoroughly. Add more resin if needed, but keep this mix as thick as possible, so it doesn't run.

8. Working quickly, use the 2" paint brush to give the repair area a generous coating of the catalyzed resin. Then, with the spatula, press the filler mix into the cavity, until it is flush with the surface.

9. Spread a sheet of cellophane film on the work surface that is at least 8" larger than the repair area. Attach masking tape strips to the underside, adhesive side up.

10. Center the cut piece of mat on the film on the work surface.
    Tip: Additional layers of mat may be needed, depending on the depth of the repair area. Be sure each subsequent layer of mat is 2" smaller than the previous layer.



Repair Techniques

11. Working quickly, pour a generous amount of catalyzed resin onto the mat on the work surface in a fairly even pattern, saturating the entire surface of the mat.
Tip: Save mixing cup of leftover resin to check cure later.

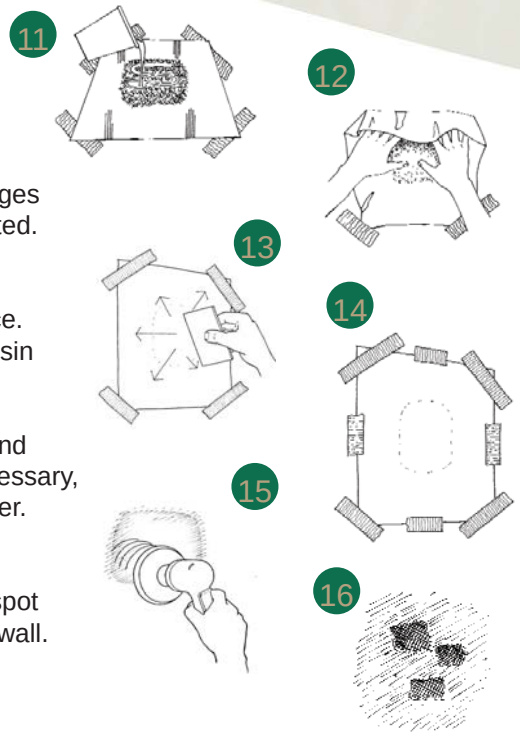
12. Lift the mat/film sandwich up to the repair area, supporting it from underneath, so the mat won't pull away from the film and fall apart. Press the saturated mat/film sandwich, holding it there with the masking tape.

13. Using the spreader as a squeegee, stroke outward from the center toward the edges with slight pressure to work the resin through the mat until it is completely saturated. Work any excess resin to 1 corner, lift the film, and pick up the surplus.

14. Work the area with the squeegee until it is flat, and flush with the adjacent surface. Tape the film securely and let the repair cure. (Cure time will vary, refer to the resin manufacturer's recommendation.)

15. When resin is cured, remove the film. Using 80 grit sandpaper, sand off ridges and high spots, and make the area flat and flush with the surrounding surface. If necessary, check for flatness with a straight edge. Fill any deep, low spots with polyester filler. Let cure.

16. Pin holes, shallow depressions, and scratches should be filled with the two-part spot filler. Fill and sand the repair until the area is smooth and even with the existing wall. Use successively finer sandpaper grits to prepare the surface for painting.
Tip: Always clean the surface before using the next finer grit sandpaper.



Deep Scratch or Puncture Repair Procedure

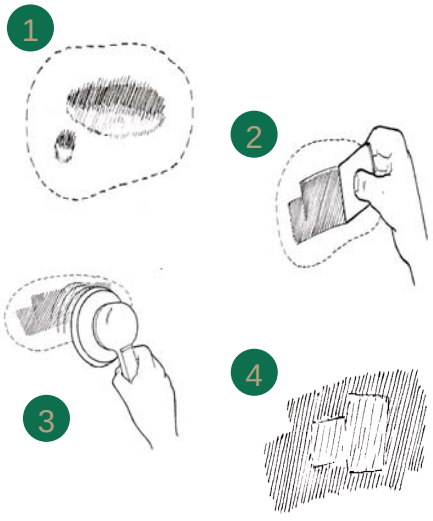
Deep Scratch or Puncture

1. With 80 grit sandpaper clean out debris and fibers, and make a slight "V", tapered outward. Widen the sanded area 2" to 3" beyond the damaged area. Blow off all dust and wipe the area clean with cleaning solvent.

2. Catalyze a quantity of the glass-filled, low shrink polyester filler and press the mix into the depression, filling it completely. Work the mix to eliminate all air bubbles and level it out, leaving it slightly higher than the surrounding area.

3. When cured, sand the filled area with 120 grit sandpaper until flush. Blow off dust and wipe area clean with cleaning solvent.
Tip: Always clean the surface before using the next finer grit sandpaper.

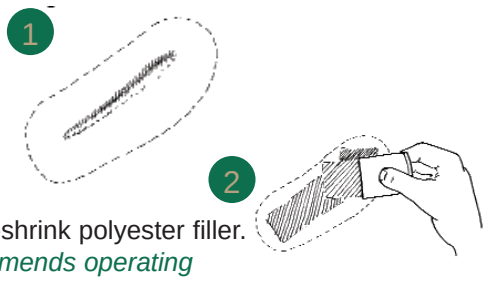
4. Fill any remaining depressions and pinholes with two-part spot filler. Sand again with 120 grit sandpaper until flat and smooth. Blow off dust and wipe clean.



Shallow Scratch Repair Procedure

Shallow Scratch

1. Sand out the scratch or crack by hand with 120 grit sand-paper. Sand 2" to 3" beyond the scratch to eliminate gloss. Wipe off dust with a clean rag and solvent.
2. **Filon Sidewalls** - Fill the depression with two-part spot filler. Let cure.
Medallion® - When repairing Medallion, fill the depression with a glass-filled, low-shrink polyester filler.
**Note: If a heat gun is to be used in removing graphics, Crane Composites recommends operating the gun at low temperatures in order to avoid further cracking the gel-coat finish.*



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Repair Techniques for Filon Panels

3. Sand the filler with 120 grit sandpaper. Blow off dust and sand with 120 or finer grit paper, making area smooth and flat. Clean off the dust.
   Tip: Always clean the surface before using the next finer grit sandpaper.

Surface Scratch Repair Procedure

1. Sand scratch with orbital sander using 600 grit sandpaper.
2. Sand further with 1200 grit sandpaper.
3. Follow up with heavy buffing using AQUA-BUFF™ or similar compound. May need to use a high speed electric buffer to get the rpm's needed.

For deeper or more severe damage, use standard conventional fiberglass resin repair techniques, prime, and paint. Paint or lacquer give a better finish than gel-coat.

Paint Pen Texturing Repair Procedure

This method utilizes a sandable primer which is an aid for getting the repair area perfectly flat and for producing an orange peel finish. The fiber texturing is added with a special fine tipped paint pen (do not use a marking pen). The finishing coat is a two-part polyurethane enamel paint.

1. Spray the area with sandable primer. Let dry.
   Tip: Before final painting, the area must be perfectly flat with no pinholes or sanding marks.
   Note: To avoid a color mismatch or at least make it less noticeable, plan the painted area to fall between natural breaks in the wall, (i.e. between windows or between the top molding and a trim stripe). The age of the unit will also effect the color match and may show the need to paint the entire sidewall.

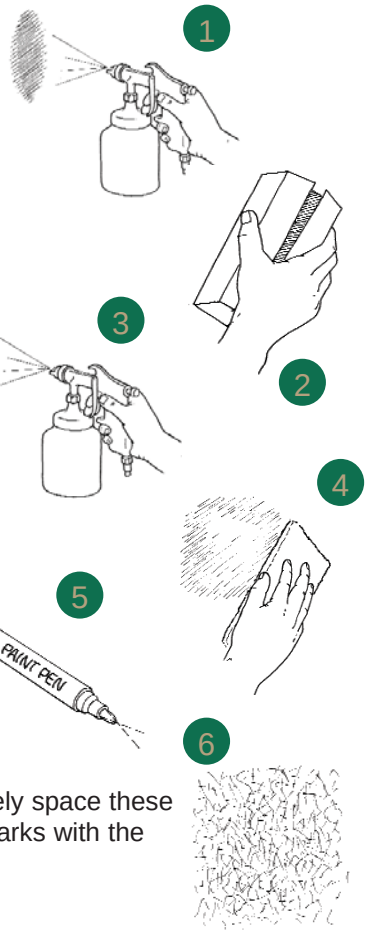
2. Hand sand the entire area using a sanding block and 320 grit sandpaper. Feather the edges. Wipe the area with cleaning solvent.

3. Prime the area again, this time holding the spray gun 12" to 18" away to create an orange peel finish. Let dry.

4. Sand the area lightly with the 400 grit pad to abrade the surface for good adhesion. Clean with cleaning solvent.

5. To simulate the fiber texture, first sharpen the felt tip on the paint pen with a sharp knife or razor blade, so it will make the finest line possible.

6. Next, make short, random directional marks on the repair surface with the paint pen. Closely space these marks in a vertical, horizontal, and diagonal direction over the entire area. Compare the marks with the surrounding area to make sure they match the Filon fiber texture. Let dry.



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7. Use the 400 grit pad to lightly sand the area just textured and a 10" to 12" perimeter beyond for blending the new paint to the Filon. Blow off all dust and wipe the area with a clean rag and solvent.

8. Mix paint to match. Spray just the textured area with several coats to cover the repair. For blending, reduce the paint to a thinner consistency and spray again covering the 10" to 12" perimeter. Let dry.

9. Buff the area with a buffing compound. Follow up with hand glaze to eliminate swirls. The repair is now finished.

Plastic Wrap Texturing Repair Procedure

This texturing method uses crumpled plastic wrap, dabbed over the freshly painted area.

1. Do a final sanding with the 400 grit pad, and extend this sanding over the entire area that will be painted to abrade the surface for good paint adhesion. Blow off all the dust, and wipe the area with a clean rag and solvent. The wall is now ready for the color coat.
   Note: To avoid a color mismatch or at least make it less noticeable, plan the painted area to fall between natural breaks in the wall (i.e., between windows or between the top molding and a trim stripe). The age of the unit will also effect the color match and may show the need to paint the entire sidewall.

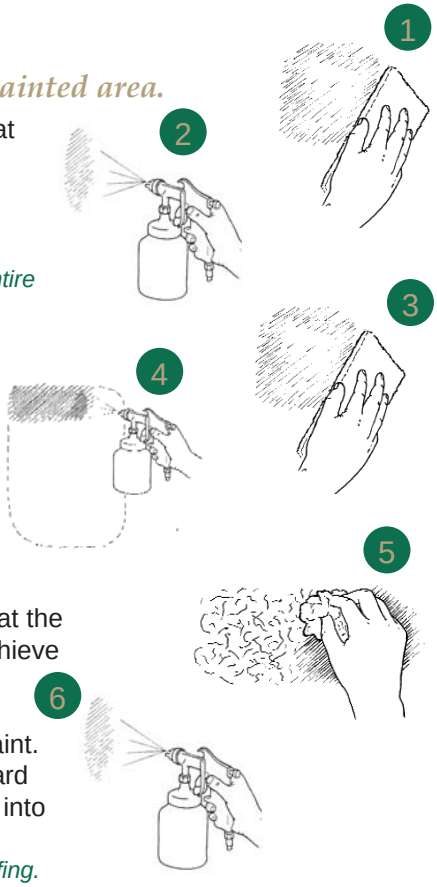
2. Spray the area with a coat of sandable primer.

3. When dry, wet sand with 600 grit sandpaper to eliminate all previous sanding marks. Wipe the area clean with a clean rag and solvent.

4. Spray acrylic sealer on a small section, and while it is still wet, dab the area with a crumpled piece of plastic wrap.

5. The pattern left by the crumpled wrap will simulate the Filon fiber surface texture. Repeat the procedure by spraying small sections at a time. Use fresh plastic wrap as needed to achieve the Filon texture look. Let dry.

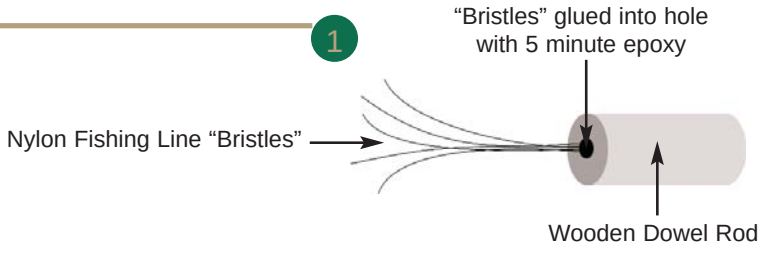
6. When the area has been completely textured, spray on 3 light coats of color matched paint. To blend the perimeter, spray thinner, lightly over the area working from the outside toward the center. Once the repair is dry, buff the repair area with buffing compound to blend it into the surrounding area. The repair is now finished.
   Tip: Hand-applying a glazing compound may assist in removing any swirl marks caused from buffing.



Texturing Tool Repair Procedure

Materials

- 1/2" Diameter Wooden Dowel Rod 2" to 3" Long
- 0.009" Diameter “Monofilament Fishing Line”
- 5 Minute Epoxy



Procedure

1. Drill 1 hole, approximately 1/8" in diameter, 1/2" deep into the end of the wooden dowel. A larger dowel may be used if more bristles are desired for texturing a larger area.
2. Cut 5 or 6 pieces of fishing line into segments approximately 3 1/2" to 4" long. The inherent curve in the line is necessary. Do not try to straighten.
3. Mix enough epoxy to fill the hole in the dowel.
4. With the dowel secured in an upright position, fill the hole in the dowel with epoxy and insert the bristles into the hole. Make sure the bristles are arranged so that they curve outwardly, and they are well-separated. Work fast as the epoxy hardens very quickly. It may be necessary to keep the bristles separated until the epoxy begins to set.

Notes

1. The “bristles” must be separated enough, to prevent sticking together during the texturing procedure.
2. The diameter of the fishing line used determines the size of the texture. A slightly smaller or larger line may work better for, but it must be stiff enough to produce the texture. A line of 0.009" usually produces an acceptable appearance.
3. The bristles may be trimmed and/or curled to achieve the desired effect.

Texturing Tool Repair Procedure for Single Stage Acrylic Urethane

Dupont ChromaOne or Equivalent

This method makes use of a simple tool to imprint a fiber-like texture into a freshly painted surface. This procedure begins at the point after the color coat has been applied to the surface of the repair.

Before Beginning this Procedure

- Have on hand at least one of the texturing tools as described in this section.
- Ensure the air supply is equipped with a oil/water trap in working condition or use a disposable filter at the gun.
- Thoroughly clean the area to be repaired with a wax and grease remover to remove any residue prior to beginning the repair. It’s a good idea to clean 1" to 2" beyond the anticipated repair area. Silicone or other contaminants (found especially around some window moldings) are invisible to the eye, but can ruin an otherwise good repair with fisheyes.

Procedure

1. Mix enough paint to cover the repair area in 2 to 3 coats. Thin as required per label directions. Note: Different brands and spraying conditions may warrant slight adjustment of the mixing ratio to achieve the desired results. The mixture and drying time will directly affect the profile of the texture.
2. Spray a full wet coat to the prepared surface, extending 2" to 4" beyond the edges of the repair. Avoid excessively heavy coats or heavy orange peel.
3. Let this coat flash for 30 to 60 seconds. This time varies with conditions. This coat should be just wet enough to prevent the texturing applied in the following steps from flowing out too much.
4. Begin applying the texture by dabbing/blotting the texturing tool into the wet surface. If the surface is at the correct stage of dryness, there should be a slight resistance when the tool is withdrawn from the surface. Continue this until the entire repair surface is textured. This step must be done as quickly as possible because as the coating continues to dry, the texturing tool will begin to leave undesirable marks or bubbles in the surface. Note: Blotting the texturing tool into the center of the repair where the paint is the wettest, and then depositing the paint into the outer edges will produce a more defined texture on the outer edges. Wipe the texturing tool periodically during use to prevent build-up of dried paint.
5. Allow to flask per the label direction and apply required number of coats to achieve coverage. Texture successive coats in the same manner as stated above.
6. Immediately follow final coat with blender over the entire area to blend edges (overspray) with the surrounding surfaces.

Lacquer Automotive Spray Paint Repair Procedure

Use this method for instances where color matched lacquer paint is not acceptable and a high quality premixed lacquer automotive spray paint is preferred for the color coat of the repair.

1. Do final sanding with the 220 grit sandpaper and then 320 grit to eliminate all sanding marks. Then use a 400 grit pad and extend this sanding over the entire area that will be painted to abrade the surface for good paint adhesion. Blow off all the dust. Use a clean rag to wipe the area with cleaning solvent. The wall is now ready for the color coat.
2. Using the directions on the back of the color matched spray paint, apply several coats of color spray paint to the repaired area.
3. When the lacquer paint is completely dry (remembering that it takes longer for the clear coats to dry), power buff the area with buffing compound. This action further blends and softens the texture to match the luster of the factory finish. Check the buffing progress often to avoid losing the texture.
4. When the buffing is completed, wash and clean the area thoroughly. The repair is finished.
   Note: If a perfect match is not available, it is better to get the paint a little on the yellow side. Buffing will hide this color difference.

Filon Medallion Finishing Method

When repairing Medallion, the following modification to section 3, the finishing process, should be used in place of spiderweb, paint pen, or plastic wrap.

1. Do final sanding with the 220 grit sandpaper, and then 320 grit to eliminate all sanding marks. Then use a 400 grit pad and extend this sanding over the entire area that will be painted to abrade the surface for good paint adhesion. Blow off all the dust. Use a clean rag to wipe the area with a cleaning solvent. The wall is now ready for the color coat.
2. Spray the area with several coats of color matched lacquer, thinned to normal consistency, making sure to feather the edges of the repaired area with the original finish.
3. Spray the edges of the painted area with slow dry lacquer thinner to eliminate the halo effect.
4. When the lacquer is completely dry, power buff the area with a buffing compound. This action further blends the repair to match the luster of the factory finish.
5. When the buffing is completed, wash and clean the area thoroughly.
6. If enamel or urethane paints are to be used, then step 3 should be omitted.

Filon Embossed FlexRoof Crack Repair Procedure

Prepping the Area to be Repaired

Clean the affected area with soap and water. Then, wipe down the area with a soft cotton rag and lacquer thinner, being careful not to leave the lacquer thinner in one spot too long. Radius edge areas to be repaired should remain in the radius position both during and after the repair.

Deep Cracks or Deep Scratches

A. Using an 80 to 220 grit sanding pencil, lightly sand the crack or scratch.
B. Fill the depressions with a flexible two-part spot filler, being careful not to distort the embossed finish.
C. If shrinkage occurs once the spot filler has dried, the affected area may be re-treated in 1 of 3 ways:
   1. Re-treat the area with spot filler
   2. Treat the area as a medium size crack
   3. Treat the area as a small size crack

Once the depression is filled and cured, color matched lacquer paint can be applied to the repaired area.

D. After the paint area dries, refer to the finishing section of this repair procedure.

Crane Composites RV Repair Techniques for Filon Panels

Medium Size Crack

A. Clean affected area as described in the "Prepping the area to be repaired" section.
B. Using a pin stripping brush, fill the depression with a high build lacquer primer, thinned according to the manufacturer's recommendations. The type of thinner used will depend on the climate in which the repair is made. The paint supplier can make recommendations on the thinner selection.
C. After drying is complete, check the depression for shrinkage and re-apply primer mixture until the depression is filled.
D. Once the depression is filled and cured, apply color matched lacquer paint to the affected area.
E. After the painted area has dried, refer to the finishing section of this repair procedure.

Shallow or Small Size Cracks

A. Clean affected area as described in the "Prepping the area to be repaired" section.
B. Using a pin stripping brush, apply a thinned, color matched lacquer paint to the affected area. Again, the paint supplier can make recommendations on the type of thinner to use, according to the climate in which the repair is made.
C. Once the paint has dried, check for shrinkage, and re-apply paint as needed.
D. After the painted area has dried, refer to the finishing section of this repair procedure.

Multiple Cracks

For areas with multiple cracks, a spray application technique may be used.
A. Clean affected area as described in the "Prepping the area to be repaired" section.
B. Spray the affected area with a high build lacquer primer thinned appropriately for the climate in which the repair is to be made.
C. Once the primer is dry, check for shrinkage, and reapply primer as needed.
D. After priming, apply a thinned, color matched lacquer paint to the affected area.
E. When the painted area has dried, refer to the finishing section of this repair procedure.

Finishing

After painting the affected area, the color may seem to flatten out. There are 2 suggested ways of restoring the gloss:
A. Buff the repaired area.
B. Using a paint sprayer, apply slow drying lacquer thinner to the affected area, being careful not to produce runs. This action will bring out the gloss and eliminate any halo affect that might have been produced by the repair.

NOTE: The age and condition of the roof may dictate the need to paint the entire roof.

Filon Gripmaster Repair Procedure

To Repair Minor Scuffs/Damage and General Surface Appearance Renewal

Materials:

- Epoxy Floor Coating, such as Rust-Oleum Epoxy Shield™

Procedure:

1. Clean Panel
2. Follow epoxy floor coating manufacturer’s guidelines for application instructions.

To Repair Severe Damage

Recommended for damaged areas up to 8" x 10" in size. Wearing disposable latex gloves, goggles, and use of an OSHA approved respirator are recommended.

Crane Composites RV Repair Techniques for Filon Panels

Materials:

- GripMaster Repair Patch – May be ordered by contacting Crane Composites, Inc. at 1.800.435.0080, faxing 1.815.467.8666, or e-mailing sales@cranecomposites.com. Please specify an 8" x 10" GripMaster Repair Patch in Gray or Black.
- 80 grit sandpaper
- 12" x 12" 3/8" to 3/4" piece of plywood to be used as a leveling plate
- Wood filler if substrate is damaged
- Liquid urethane adhesive (as recommended by the adhesive supplier for use on frp products)
- Trowel
- Goo Gone® adhesive remover or equivalent
- Rags
- Several sheets of 12" x 12" wax paper
- Newspaper to use for template
- 2" wide masking tape
- Dry Diamond Blade Saw or Roto-Zip® Tool
- Latex gloves
- Chisel
- OSHA Approved Respirator
- Goggles

Preparation:

1. Using a Dry Diamond Blade Roto-Zip type tool or equivalent, cut out a squared shape of the damaged area that is less than 8" x 10". The depth of cut should be no deeper than the thickness of GripMaster to minimize damage to the substrate. A chisel will aid in cutting through on corners and removal of the damaged GripMaster.
2. Remove all traces of bonding adhesive in the cut out area with the use of a chisel and a sanding tool.
3. If needed, repair the substrate using wood filler or suitable filler. Substrate needs to be flush with surrounding substrate and level with the bottom of the GripMaster.
4. Remove all dust and dirt from the repair area.

Patch:

5. Prepare a template using the newspaper if the repair areas are smaller than 8" x 10". Cut the GripMaster repair patch to match the template and dry fit the patch.
6. Sand the backside of the GripMaster patch with the 80 grit sandpaper.
7. Mask off the area around the edge of the repair areas using masking tape.
8. Follow the liquid urethane adhesive manufacturer's instructions for applying the adhesive to the back of the GripMaster patch.
9. Place the coated GripMaster patch in the repair area.
10. Center a piece of wax paper over the repair area.
11. Put the plywood leveling plate over the repaired area and gently press down.
12. Remove the plywood and make sure the GripMaster is level with the surrounding GripMaster.
13. Wipe away all adhesive squeeze-out from the GripMaster patch and masked off area and dispose of the wax paper.
14. Re-mask. Place another sheet of wax paper over the repaired area. Replace the plywood and press down again.

Finishing:

15. Repeat steps 12 to 14 until adhesive squeeze-out stops and patch is level with surrounding area.
16. Place a weight on top of the plywood, such as a full gallon can of paint, and allow two hours of initial drying time.
17. Remove plywood, wax paper, and masking tape from the repaired area.
18. Use a rag and solvent to clean the repaired area.
19. Allow patch to cure for 24 hours before resuming normal use.

Filon Repair Video Order Form.

A video detailing how to repair and restore the finish of Filon smooth sidewall panels is available from Crane Composites, Inc.

Name: _____

Company: _____

Address: _____

City: _____ State: _____ Zip: _____

Phone: _____ Email: _____

Video: _____ Quantity: _____

Crane Composites, Inc.

Recreational Vehicle COLLECTION

If You Have any Questions or Need Additional Assistance, Please Do Not Hesitate to Contact the Crane Composites Customer Care Department at 1.800.435.0080

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