

# VIXEN FRP™

## Repair Techniques

### IMPORTANT: READ INSTRUCTIONS BEFORE BEGINNING ANY REPAIR WORK

The following instructions are presented as guidelines and in good faith but without guarantee. Neither Fibrosan® nor Vixen Composites™ bear any responsibility for results of actions taken or not taken. Certain aspects of FRP repair are assumed to be general knowledge and as such are not included in these instructions. As such, these guidelines are not intended to serve as a step-by-step, foolproof process but are only strictly recommendations.

#### All risks are assumed by the user.

If you have any questions about repair techniques for the particular type of Vixen FRP being repaired, please call 1-574-970-1224 and ask for Customer Care between the hours of 8:00am to 5:00pm EST Monday thru Friday.

Caution: Disposable latex gloves, goggles, and use of OSHA approved equipment/respirators while working with FRP is highly recommended. Read and follow all manufacturers recommendations on labels of all materials used in the repair procedure. Some materials may be flammable and should be used with extreme caution.

### SAFETY PRECAUTIONS

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

### RECOMMENDED SUPPLIES AND EQUIPMENT

#### Paint, Fillers and Fiberglass



#### WARNING:

THOSE ITEMS BELOW MARKED WITH A  ARE FLAMMABLE.

Read manufacturer's directions carefully before using. Use in a well-ventilated area.



- 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)

# VIXEN FRP™

## Repair Techniques

### 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)

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### EQUIPMENT

Disc sander

Air compressor

Two spray guns

Buffer

Bench-type work surface

## Procedures for all repairs

### PREPARATION

Determining the extent of the damage (size and depth)

Because the full extent of a damaged area is not always apparent it is important to identify the complete area requiring repair. All damaged areas as well as any discolored or stress spots in adjacent or surrounding areas must be repaired.

Protect areas that do not require repair by isolating the damaged areas with masking tape and cover the remaining areas with plastic.

### REMOVING THE DAMAGED AREAS

Remove any damaged material. This can be done with a jigsaw, a circular saw with a diamond blade or a disc sander and hand tools such as files or rasps. Avoid prying out material to prevent further damage to the surrounding material. Breaking out material is not recommended as the (bending) tension created by such procedures may extend into the surrounding undamaged areas thereby damaging them. Be sure to round off edges and corners as tension created by the bending may concentrate at these spots and produce new fractures or cracks. Precise cutouts may be achieved with a router.

# VIXEN FRP™

## Repair Techniques

### SELECTING THE REPAIR METHOD

Once the damaged materials have been removed, determine which repair procedure is most suitable for the type of damage sustained and which materials will be needed for the repair. Depending upon the degree or depth, a surface repair procedure for superficial damage may be addressed with minor surface sanding or buffing and/or painting. For deeper or more severe damage to the panel, this usually consists of a matrix resin combined with corresponding reinforcing material (fiberglass mats, woven roving or chopped strand mats) for damaged laminate and/or additional adhesives and insulation material.

### SURFACE PRETREATMENT

After determining which repair procedure is necessary, assemble the required tools and materials and begin to pretreat the surface. All sharp edges must be ground on a bias, utilizing a rasp or disc sander equipped a fan type disk. The minimum dimension for the mounting surface width is 10 times that of material thickness.

The final sanding operation should be performed manually with fresh sandpaper (80 or 40 grain). Sanding by machine at this point may cause smoothing of the surface, which could result in the inability to bond. Rough sanding of the substrate surface ensures a good bond with the repair material. Remove any sanding dust with dust collecting cloths or rags soaked in solvent.



#### WARNING:

**ACETONE AND MANY OTHER SOLVENTS ARE HIGHLY FLAMMABLE AND CAN BE TOXIC.**

Read manufacturer's directions carefully before using. Use in a well-ventilated area.



The use of compressed air is discouraged as airborne dust may settle on surfaces to be painted or bonded.

### REPAIR TECHNIQUES FOR VIXEN FRP™



#### WARNING:

**PATCHING MATERIALS ARE FLAMMABLE**



#### Severe Damage Repair Procedure

##### Deep Gouge or Tear

1. Prepare the area to be repaired by cutting away the damaged portion of the panel. Using the appropriate tool, remove the ragged edges and all the broken pieces of the FRP and the Lauan.
2. Rough up the inside edges of the area to be repaired by sanding from the inside edge outward all around the substrate and on the fiberglass skin. Continue sanding with #120-grit sandpaper, another 4" to 5" beyond the repair area to eliminate gloss and assure adhesion.
3. Use #60- to #80-grit sandpaper, sand away the fiberglass skin. Expose 4" to 6" of lauan backing and remove any bonding adhesive.
4. Wipe the area clean with a rag and solvent making sure to remove any and all dust that may interfere with the repair process.
5. Mask the area with tape and paper or plastic, being sure to protect the area below the repair from any run-off.
6. On a work surface, cut a piece of fiberglass mat into small ¼" – ½" length chunks and put the chunks into a mixing cup.
7. In addition, cut a piece of fiberglass mat to the shape of the area to be patched allowing for extra fiberglass mat to overhang the outer edge of the repair area.
8. Following the resin manufacturer's instructions, thoroughly mix a generous amount of resin with catalyst to saturate the cut mat, plus 1/3 more for the mat pieces in the mixing cup. Dab the resin onto the area to be repaired and onto the mat to wet it out.

# VIXEN FRP™

## Repair Techniques

9. Fill the mixing cup with the chopped mat with catalyzed resin. Keep this mix as thick as possible so that it doesn't run.
10. Working quickly, give the repair area a generous coating of catalyzed resin. Then with a putty knife, press the filler mix into the cavity until it is flush with the surface.
11. Spread a sheet of cellophane or similar film on the repair area making sure the cellophane or similar material is approximately 8" to 10" larger than the area being repaired.
12. Using the spreader as a squeegee, stroke outward from the center to the edges. Be sure to work the resin through the mat completely saturating it. Work excess to any corner and remove. Area to be repaired should be flat and flush with the surrounding area.
13. Let the area under repair cure. Cure times may vary by temperature, humidity etc. Consult the manufacturer's instructions for proper cure time.
14. After the resin is cured usually several hours or overnight, remove the cellophane or similar material.
15. Using #80-grit sandpaper, sand ridges and high spots to make the area flush with the surrounding surface. Fill any deep or low spots with polyester filler and let cure.
16. Scratches, pin holes and shallow depressions should be filled with a two-part spot filler. Sand to ensure repair is flush with surrounding surface. Use successively finer sandpaper to prepare surface for painting. Always clean the surface before using the next finer grit sandpaper.

### PUNCTURE REPAIR OR DEEP SCRATCH PROCEDURE

#### Puncture or Deep Scratch

1. Clean area to be repaired of any fiber and fragments. Using #80-grit sandpaper create a "V" tapering the edges outward. Enlarge the sanded area 2" to 3" outside the area to be repaired. Eliminate any dust and wipe clean with a cleaning solvent.
2. Catalyze a quantity of glass-filled, low shrink polyester filler and press mix into the depression created in step one completely filling it. Eliminate all air bubbles and level out the mix but leaving it slightly higher than the surrounding area.
3. Allow to cure – usually several hours to overnight.
4. Once cured, sand the filled area with #120-grit sandpaper until the repair area is flush with the surrounding area. Eliminate any dust and wipe clean with a cleaning solvent.
5. Pin holes and shallow depressions should be filled with a two-part spot filler. Sand to ensure repair is flush with surrounding surface. Use successively finer sandpaper to prepare surface for painting. Always clean the surface before using the next finer grit sandpaper.

### SHALLOW SCRATCH REPAIR PROCEDURE\*

#### Shallow Scratch

1. Sand out the scratch by hand with #120-grit sandpaper. Sand 2" to 3" beyond the scratch to eliminate any gloss. Eliminate any dust and wipe clean with a cleaning solvent.
2. Fill the depression with two-part spot filler.
3. Allow to cure.
4. Sand the filler with #120-grit sandpaper. Make the area smooth and flat. Eliminate any dust and wipe clean with a cleaning solvent.

\*If using a heat gun to remove graphics from the repair area, operate the gun at low temperatures to avoid additional cracking to the gel-coat finish.

# VIXEN FRP™

## Repair Techniques

### SURFACE SCRATCH REPAIR PROCEDURE\*

#### Surface Scratch

Small scratches do not penetrate deep into the gelcoat and can often be polished out without difficulty.

1. Sand surface scratch with orbital sander using #600-grit sandpaper.
2. Sand further with #1200-grit sandpaper.
3. Follow up with heavy buffing. You may use a high-speed electric buffer, but avoid generating excessive heat, which could result in deformation of surface or cracking.
4. For more slightly more severe damage use conventional fiberglass resin repair techniques, prime and paint.

\*If using a heat gun to remove graphics from the repair area, operate the gun at low temperatures to avoid additional cracking to the gel-coat finish.



#### **WARNING:**

**OVERHEATING MY CAUSE BLISTERING AND POOR COLOR MATCH**

### PAINT PEN TEXTURING REPAIR PROCEDURE

Sandable primer is used as a means of achieving a wholly flat surface. The texturing is added with a specially designed fine tipped paint pen (DO NOT USE A MARKING PEN). A two-part polyurethane enamel paint provides the finishing step.

1. Spray area to be repaired with sandable primer. Allow to thoroughly dry. Ensure that the area to be painted is perfectly flat with no pinholes or sanding marks. Depending upon the age of the unit matching the color may prove extremely difficult. In this instance it could indicate the need to paint the entire sidewall. Repairs falling between natural breaks in the wall (i.e., between windows or molding) may help to make the repair less noticeable.
2. Hand sand the entire area preferably using a sanding block and #320-grit sandpaper. Make the area smooth and flat. Eliminate any dust and wipe clean with a cleaning solvent.
3. Prime the area again. Holding the spray gun 12" to 18" away will help create an orange peel effect.
4. Let thoroughly dry.
5. Lightly sand the area with #400-grit pad to abrade the surface; this will allow for good adhesion. Eliminate any dust and wipe clean with a cleaning solvent.
6. To create a simulated fiber texture, sharpen the tip of the paint pen with a sharp knife or razor blade in order to make the finest line possible.
7. Make short, random directional marks on the surface of the repair area with the paint pen. Space the marks closely in all directions, vertical, horizontal and diagonal. The goal is to create the impression of fibers running through the repair area.
8. Let thoroughly dry.
9. Use a #400-grit pad to lightly sand the area in a 10" x 12" larger area in order to allow for blending. Eliminate any dust and wipe clean with a cleaning solvent.
10. Mix identical paint to be matched and spray several coats over the area to be repaired. To blend, reduce to thinner consistency and spray again.
11. Let thoroughly dry.
12. Buff the area with a compound suitable for the paint used. See paint manufacturers recommendations.
13. Use a good quality hand glaze to eliminate swirls.

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TROUBLESHOOTING GUIDE	
PROBLEM	POSSIBLE CAUSE
Color Doesn't Match	Wrong Batch used for Patching Fillers Added Too many Accelerators Added Catalyst Level Off Patch Under Cured Trapped solvent Buffer Developed too much Heat
Patch is Dull	Under Cured Low Temperature Sanding too Quickly Trapped Solvent
Comet Tails	Too Course Sandpaper used on Last Sanding Buffing too Hard Dry Pad
Low Gloss	Excessive Buffing Pressure Coarse Compound
Sanding Marks	Too Coarse Sandpaper or Rubbing Compound used in Last Step – Work up through 600 wet Under Cured
Ring Around Patch (Halo)	Edges not Feathered Not Sanded Properly Porosity in Original Gelcoat – May have to Overspray Uncured Patch Improper Level of Patching Aid
Crack Reappears	Crack was not Fully Ground Out Weak Laminate
Patch is Glossy, Part is Dull	Original Gelcoat under Cured Buffer Developed too much Heat Too Much Patching Aid
Porosity or Void in Patch	Not Sprayed or Leveled Properly Filler not Mixed in Properly Trapped Solvent Air not Worked Out
Patch is Depressed or Shallow	Patch will Shrink – Allow for this by Overfilling Patch Sanded and Finished before it was Cured “Hot” Buffing Caused Patch to Shrink Patch Needed to be Conditioned by Pre-Buffing before Sanding



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