Gelcoat Repair Techniques

Many of the questions concerning the repair of fibre-glass boats seem to revolve around the techniques used when applying polyester gelcoat over a repair made with WEST SYSTEM® epoxy. There are several steps to a successful repair. It is important that these steps are done in the proper order to assure a well matched colour repair.

1. One of the steps that is frequently left out is to apply a sealer coat of epoxy to the repair area. This is necessary to fill any porosity in the patch. Apply two or three very thin coats of epoxy, extending each coat slightly beyond the previous one. Warm the area with a heat lamp to speed the cure and to help the epoxy flow out nicely.

2. When the sealer coat has cured, wash thoroughly with water and a 3M Scotch-brite pad to remove any amine blush. Any blush left on the surface may inhibit the cure of the gelcoat. This ***very important*** step is often forgotten, and the result is usually an unsatisfactory repair.

3. Sand the epoxy coated repair area with progressively finer grits of sandpaper. Finish with 220-grit wet or dry.

4. De-wax an area twice as large as the diameter of the repair. Apply tape around the perimeter of the de-waxed area. Use masking paper to protect the boat from overspray. If there is a molded bodyline or corner near the repair, you may want to extend the colour patch to that point. The same is true for a painted or vinyl stripe.

5. Sand the additional area out to the tape line with 320-grit paper. This will be the total area to be gelcoated.

6. Determine the gelcoat batch size for the size of the repair. Approximately 2m^2 per 1 litre.

7. Tint the batch of gelcoat to match the colour of the boat. If the boat is fairly new and the manufacturer is still in business, you may be able to get gelcoat that will be a very close colour match. If this is not an option, you will need to get the gelcoat from a FRP product supplier. You will need pigment to tint the base colour to obtain a good match. These pigments are generally available from the gelcoat suppliers.

There are several gelcoat additives that, when used properly, make matching a repair easier. These are clear, low-viscosity resins which are not air inhibited. These products are mixed with the pigmented gelcoat in place of a wax solution to provide a tack-free cured surface. They also provide the added benefit of thinning the gelcoat without changing the color of the cured patch the way acetone or styrene can.

Matching the repair colour to the colour of the boat is probably the hardest part of the entire job. You will find that most gelcoat colours change as they cure. As you tint the gelcoat to match, apply a small amount of uncatalyzed material to the sanded area surrounding the repair. Use your gloved finger to spread this into a sample the size of a 10c piece. Wait a couple of minutes for the solvents to flash off. Any colour variation will be evident. If the colour match is not acceptable, change the colour by adding small amounts of tinting pigments. As you adjust the gelcoat colour, try to think in terms of primary colours, ie. the colour needs to be blacker or redder or bluer or greener etc.... This will help you identify which of the pigments to use. Use very small amounts of the pigments.

You may even need to dilute the pigment with white gelcoat to weaken the effects. Apply an uncatalyzed smear on the surface until you have the colour as close to the boat colour as you can get it. When you are satisfied with the colour match, wipe away all the test smears with acetone or lacquer thinner.

8. Divide the batch into a 2/3 portion and a 1/3 portion. Mix the patching additives with equal parts of the 2/3 portion of the matched gelcoat. Catalyze following recommendations of the gelcoat supplier. *Over or under catalyzing may prevent the product from reaching a proper cure.* Apply this mixed gelcoat to the surface of the repair with a spray gun. Apply several light coats, feathering each one further from the repair area. Allow the solvent to flash off between coats. You may need to apply five or six coats to hide the shadow of the repair.

Most gelcoat colours will dry lighter in colour if they are too thin. Most manufacturers recommend a total film thickness of 15 to 20 mils. A common mistake is to apply two or three heavy coats, causing solvent entrapment and inhibiting the cure. This may also have an effect on the colour of the cured repair.

9. Make another mixture with the 1/3 portion of gelcoat and patching additive. This time use about three parts of patching additive with one part gelcoat. Spray the first coat of this mixture over the previously sprayed area. Then apply two or three more coats of this mixture over the entire area. Extend each coat further than the previous one, with the last coat out to the tape line. The semi-transparent film of lightly tinted clear patching additive will allow the original gelcoat colour to show through around the perimeter of the patch. This will help blend any subtle colour change into the original gelcoat.

10. Once the gelcoat has reached a full cure, pull the tape and sand the tape line smooth. Start with 320-grit wet or dry paper and work up to 600-grit. Sand the surface of the repair if necessary.

11. Buff the surface with a white, medium-cut rubbing compound. Take your time and do not over heat the surface while buffing. The excess heat can cause a stain which will be very difficult to remove. Finish with a fine compound and wax the area.

There are times when the repair will not match simply because the original gelcoat colour has faded. You may need to polish the entire side of the boat to restore the original colour.

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