

The Real Story of Osmosis Blistering Treatment, Cure and Prevention

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by

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DRYING THE HULL

One significant feature of my discoveries in the refurbishment of older GRP hulls is that it is utterly unnecessary to dry the hull for months with a dehumidifier tent, etc., etc. For mild blistering where removal of the gelcoat is not necessary, one to two weeks drying in warm weather (once the hull is sanded to bare gelcoat) is sufficient. If the gelcoat were stripped from a seriously damaged hull, a week in warm weather is adequate for the hull to dry sufficiently that the first (moisture-dissolving) coating may be applied. If the damaged laminate is not dry, but rather suppurating strange-smelling liquids, the gel-coat will need to be stripped and the hull re-launched for a week, hauled out again and then rinsed and allowed to dry.

Drying should not be necessary if there is no damage. A decent moisture-diffusion barrier coat is a wise idea, in that case. Once back in the water, less water will diffuse into the laminate from the water outside the hull, and so the laminate will slowly dry out on its own (with adequate ventilation through the bilge area).

The drying is part of blister prevention. If one does not take effective action, then the need to repair more and more blisters will continue. I personally believe in fixing it once. A person's labor to fix their boat is usually worth more than the cost of even fancy materials. Drying of a hull needs to be done externally as well as internally. On the outside, a number of those three-foot-square, six-inch thick fans that blow up a storm are what you want, aimed to move the prevailing winds to and past the hull, as well as something to move inside air through the bilges and compartments, and out. Inside ventilation is even more effective than outside, where the gel-coat is largely intact.

Moving air evaporates water faster than anything else, and the removal of excess water in the laminate is the key to a more successful blister repair, whether one uses the fanciest epoxies or the cheapest polyester.

With adequate ventilation most hulls are adequately dry in a few weeks, but there are exceptional situations.

Stripping the gelcoat with a "peeler" will give a hull that dries the fastest, all other things equal.

Measure the laminate with a non-contact moisture meter (meaning do NOT use the ones with sharp pins that stick into the surface being measured) in an area under the waterline, where blisters are worst, and compare with an area always dry, usually near the topsides. That will give you a clue as to relatively how dry the whole hull is. The recommended meter is a Wagner L606.

A typical turn-around time for a franchisee in Europe was three to five weeks, depending on weather and hull condition.

General repair instructions

1. Grind out or sandblast all blisters down to sound laminate. Get under all of the loose material. Some blisters may have a colored liquid in them. Don't get any of this in your eyes or on your skin - it may be very caustic. Some hulls may have an advanced state of chemical decomposition. This may be recognized by a strong chemical smell such as vinegar or a solvent, which may be noticeable after peeling the gelcoat or grinding down the hull. An advanced state of chemical decomposition may also be recognized by liquid, apparently water, oozing out of the laminate where a blister has been ground out, and leaving a visible residue which dries on the surface. Such hulls should have the entire gelcoat ground off or peeled to expose the underlying laminate containing chemical decomposition products. This may also require removal of some laminate. Chemical cleaning may then be accomplished in any of several ways: the hull may be hosed down with water every hour for a few days; a garden hose with many small holes such as is used to slowly water a garden may be draped around the hull to slowly and continuously rinse the hull with water; or the hull may be launched and left in the water for a few days to a week and then hauled out again. Some fresh water rinsing and a week or three to dry out (depending on weather and temperature) should then give a hull sufficiently dry to continue.

Simple moving air from fans evaporates water more efficiently than complex dehumidifiers, etc. The mobility of dissolved water through the GRP laminate is relatively slow, and when water reaches the laminate surface the fans quickly carry it away.

2. If the gelcoat is not to be entirely peeled, sand it all down to clean gel-coat. Sand any gelcoat that is left. You must get past the gloss surface of the gelcoat. It is a wax-rich surface, and it may also be degraded by exposure to the water. With many large blisters, it will be necessary to strip off the gelcoat and treat as discussed above. Then, inspect closely. Then let it sit a week outside with good ventilation

inside and out, and see if any small blisters on the surface have now become visible as they dried. If there are no visible signs of blisters, then a good epoxy moisture-diffusion-barrier coat (there are products designed specifically to do that) will offer long-term protection if the boat stays in the water all or most of the time. If there are blisters, then follow my advice if you use my products.

Follow the advice of the manufacturer of whomever's products you use, generally. Try to make sense of conflicting advice if you have it, based on a fundamental understanding of what is going on, which my literature should give you. Cope as best you can with local materials if you have no alternative.

3. Allow a week or two in warm dry weather for the excess water to evaporate out of the hull.

4. Apply Clear Penetrating Epoxy Sealer™ to saturate the laminate. The Cold Weather Formula™ applied late in the day is recommended in all but the warmest climates, where the Warm Weather Formula may be used. This product contains solvents and the choice of which version to use is a solvent evaporation issue. Allow a few days to perhaps a week to dry and cure; then apply a second coat of which little should soak in. In extreme cases a third or even fourth application may be necessary. Allow sufficient time between each application that the hull no longer smells strongly of solvents before continuing; this may take a few days to a week in moderate weather. In cold weather the Cold Weather Formula™ of our Clear Penetrating Epoxy Sealer should be used.

5. Apply two roller coats of Smith & Co. High-Build Epoxy Paint™. Use the red for the first coat and any other of our standard colors for succeeding coats. Use contrasting colors so that no areas are missed when applying successive coats, and so that the depth to which one has sanded is visible and controllable. Allow 4 hours drying time between coats, and apply no more than two coats in two days. Allow a day or two for the epoxy paint to fully cure so it can be sanded without dusting. Then rub the entire surface down with an abrasive pad. This is a necessary step. It breaks off the microscopic stubs of glass fibre sticking up through the paint, that would otherwise act as water-wicks and create recurring blisters in the finished job.

6. Fill all holes with Smith & Co. Fill-It™ Epoxy Filler. Mix thoroughly according to the application note for thoroughly mixing fillers. Allow to cure overnight, then sand. Stop sanding when you expose the red layer.

7. Apply three more coats of contrasting colors of High-Build Epoxy Paint. 4 mil wet film thickness per coat is equivalent to 400 sq. ft/gal/coat.

8. Several days further drying time should be allowed to reduce the possibility of solvent blistering. The Antifouling Paint may then be applied below the waterline, and topcoat and bootstripe above.