



CUSTOMER SERVICES BULLETIN

HOW TO REPAIR OSMOSIS BLISTERING

Throughout the boat building industry there is much speculation as to what causes osmosis blistering. The purpose of this bulletin is not to add to the confusion by suggesting how it happens, but to describe repair techniques. Osmosis blistering in a simple description is the forming of water blisters between the fiberglass laminate and gelcoat or in between the laminate itself. The problem is detected from the outer side of the hull by the formation of protruding blisters or by using a moisture meter to detect moisture in the laminate.

DRYING THE LAMINATE

The blisters must first be opened by grinding with a coarse 24 – 36 grit disc and letting them drain. Since this will not remove all the water in the laminate, the chart below gives recommended times in order to achieve a relative humidity of below 50%.

DRYING TIME IN DAYS FOR VARIOUS AIR TEMPERATURES AND RELATIVE HUMIDITY TO REACH AN ACCEPTABLE WATER LEVEL FOR REPAIR

<u>TEMPERATURE</u>	<u>50% RELATIVE HUMIDITY</u>	<u>25% RELATIVE HUMIDITY</u>
100 Degrees F	16 Days	9 Days
83 Degrees F	32 Days	18 Days
65 Degrees F	64 Days	36 Days
47 Degrees F	128 Days	72 Days

This table is based on 1/4" thick hull sections and only if both sides of the hull are exposed to drying air. It is important that the bilge is completely dry.

CLEANING THE BLISTERS

Once the blisters have stopped weeping the hull should be washed with water and tri sodium phosphate (TSP). A small bit of ammonia may also be added. This will help clean the sticky residue from the blisters.

REPAIRING WITH EPOXY

Once the blisters are dry they can be filled with epoxy putty. Aqua set epoxy resin mixed with Mini Fibers and Glass bubbles make an excellent putty that is easy to sand and yet will not sag. Mix 2 parts of Aqua Set resin with 1 part of hardener by volume. Add to this mixture approximately 2 parts of Mini Fibers and 1 part Glass Bubbles by volume. Mix the fillers with the epoxy resin until a

creamy putty is obtained. To apply this mixture, use a spatula or wide putty knife. If the blister cavity is large, a second coat of putty may be applied after the first coat of putty has cured and been lightly sanded. The viscosity of the putty can be varied by adding more Mini Fibers for a thicker putty or additional mixed resin to thin out the putty.

After the putty has cured (2 – 7 days, depending on temperature) it can be sanded using an electric sander with 80 grit sandpaper. A final sanding with 180 grit sandpaper will prepare the surface for sealing.

REPAIRING WITH POLYESTER

The Fiber-Tek polyester method will help reduce the cost of repairing osmosis blistering. It is imperative that the blister cavities are completely dry before being filled with putty. To mix a putty suitable for trowelling into the blisters, add 2 parts of cab-o-sil and 1 part glass bubbles by volume and 1 part of uncatalyzed resin by volume. Add catalyst to this mixture as per instructions of the side of the container. Always remember to add an extra ½% catalyst to compensate for the fillers in the resin. If a thicker putty is required, add more cab-o-sil to the mixture. For application and sanding instructions please refer to REPAIRING WITH EPOXY.

SEALING

The next step for the prevention of blistering is to coat the hull from the waterline down with two coats of S1 Sealer. The S1 Sealer should cure for approximately 3 days and be sanded prior to application of the primer. The sealer coat will give an additional barrier coat against water penetration into the laminate. For complete mixing and application instructions refer to S1 Sealer brochure.

PRIMER AND ANTI FOULING

The last step before application of anti fouling is coating the hull with a 2 part epoxy primer. This will give an additional water barrier layer as well as giving better adhesion for anti fouling. For complete mixing and application information refer to the manufacturers instructions.

PREVENTATIVE MAINTENANCE

Osmosis blistering does not only occur from water pressure on the outside of the hull but also from water in the bilge. For this reason, it is very important to keep the bilge dry.

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