Blister Occurrence, Detection, and Treatment.

Manufacturers, dealers, and brokers may claim that a particular fiberglass boat will not get blisters. Some repair facilities may claim that they can "cure" blisters. Our experience suggests that these claims are wrong, at least for our geographical area. Any permeable, layered structure with discontinuities in H_2O diffusion coefficients, that is in continuous contact with seawater (i.e. a fiberglass boat) is prone to blistering - sooner or later. **No resin or additive mixture used in boat building and repairing is impervious to water diffusion.**

We have seen blistering on several popular production boats within three years of commissioning. This includes some with proprietary, factory applied, "barrier" coatings. Virtually all boats can be expected to have at least some gelcoat blistering by about 8 to 12 years of age. A few boats older than 12 years may appear not to have blisters, however, we expect that, in our area, **all fiberglass boats eventually will blister**. Keeping a boat out of the water (dry-stack, lift, or hauled for several months yearly) may help prevent blistering, but is no guarantee.

On the Gulf coast we are essentially in the Tropics. Water temperatures are more than 80°F (27°C) for several months and never go much below 60°F (16°C). Typically boats get hauled for a few days only every 2 to 4 years. In our experience 99.9% of boats over 3 years old, in this area, will show a "wet" reading on a moisture meter below the waterline.

There is no currently available technique used in routine marine surveys that can reliably predict if blistering is imminent, or provide any prediction of when blisters may appear on a hull. We make every reasonable attempt to determine if blistering is present at the time of survey. However, especially if the hull is dry, blistering may not be detectable externally. Even if a hull is "blister-free" on the date of inspection, blisters can develop virtually overnight.

For boats that already have developed blistering, we believe that **there is no permanent cure for blisters**. All currently available treatments will provide only a temporary abatement of the problem - blisters will occur again - sooner or later. In our experience, older boats that have been "peeled", "dried", and epoxy or vinylester "barrier coated" may go 5 to 12 years before re-blistering depending on the quality of the work. There are other treatment options, including doing nothing, that may be more cost effective depending on the age, value, and construction of the hull. As with all service work, even using the same basic techniques, there are good careful jobs that perform as expected, and poor sloppy work that fails prematurely.

Blisters on fiberglass vessels are not necessarily anomalies, deficiencies, or failures, they have to be expected as a routine consequence of aging of this particular material. The good news is that common **fiberglass blistering very rarely produces a serious structural problem** on boats. No solid fiberglass hull that we have seen, has been sunk or functionally destroyed by common, so-called "osmotic" blistering. In virtually all cases in solid fiberglass hulls, there is no urgency in treating blisters. (Cored fiberglass hulls with water intrusion are more problematic.) Various treatment options have to be considered based on the cost and long-range benefits relative to the value of the vessel. The treatment appropriate for a "million dollar" yacht may not be best for an aging "mass-market" pleasure boat.

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