

Ask Dr. Gel



by Dave Weakley



Dave Weakley is the owner of American Boat Restoration and has been helping Northeastern boaters keep their boats in fine trim and good repair for over 40 years.

“Email me or call me with your questions! I’ll be happy to help you out!”

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Take the Doctor’s Advice

“My boat has gelcoat cracks on the deck and hull. There are also little bumps on the hull below the waterline, some have broken open; can water get into the fiberglass? What should I do?”

Carl D. – Malta, NY

The gelcoat on a boat is a polyester based resin; it is a very porous material. It never stops curing; the older it gets the more brittle it becomes. The constant exposure to moisture, dirt and UV sunrays can break it down. The “little bumps” you have are called osmotic blisters and have developed from exposure to wetness. They can break open and along with the cracks a.k.a. crazing, will allow water seepage and ultimately penetrate into the fiberglass.

What a lot of people don’t realize is that gelcoat is not waterproof. Moisture can seep into the gelcoat even if the surface is not broken. If enough moisture gets into the laminate the structural core materials will eventually be vulnerable to damage and the construction of the boat could become compromised.

Carl, this is a great question...My best advice to you is to have the cracks and blistering repaired as soon as possible and to shield the boat from the elements!

Gelcoat should always have a protective coating. ALL of it! ALL the time!

Preventive Medicine

Above the water line your entire boat should be regularly cleaned and rubbed with a good UV shielding wax; your choice or we recommend two products Collinite #885 Special Heavy Duty Fleet Wax or what I use, Collinite #845 Liquid Insulator Wax. Both are great products made in Upstate NY and are available on line or at many local marine supply stores. All season long you should regularly clean and WAX your boat! I stress the importance of cleaning your boat before you wax it, because dirt is also a culprit in the deterioration of gelcoat. I can not emphasize enough the importance of keeping your boat waxed! Apply it before it is stored for the season, it’ll make spring prep a whole lot easier

Below the water line - If your boat is new or old

and in the water all season long you will want to reduce the development of osmotic blistering and crazing. To do this you need to protect your hull with a coating system – Epoxy Barrier coat along with an optional antifouling paint should be applied. There is a laundry list of the types & brands to choose from and it is essential to choose the right one. Note- Bottom paint does not need to be applied over Epoxy Barrier.

Bottom or anti-fouling paint slows the growth of algae, critters, barnacles, etc thus producing better speed and boat performance. It’s important to know that bottom paint alone will not protect the hull from water absorption exposing it to potential osmotic blistering.

We have written many articles about how to protect a hull; it’s a significant topic and worth repeating especially for new boat owners or those that missed previous articles.

Applying epoxy barrier coat on the bottom of your hull is like buying insurance especially and most importantly if you keep your boat in the water all season.

Epoxy Barrier Coating is like the name implies - it is a two part epoxy that protects hulls from water absorption into the gelcoat. It

acts like a wall, blockade and impediment to water. Epoxy barrier coats are the best impermeable to water coating for helping absorption unlike polyesters which will absorb water. The gelcoat on your boat is made of polyester. Epoxy barrier should be used as a primer for bottom paint. Barrier coat is more important than bottom paint and can be purchased for less than bottom paint depending on the manufacturer and type of bottom paint chosen. If you plan to apply barrier coat make sure the hull is prepped properly. You will need to tape off at the water line using good quality fine line tape. Sand the entire hull below the tape with 80 grit sand paper. This will assure good paint adhesion. You do not want to see any shiny areas on the hull. If you apply paint to shiny areas it will eventually flake and peel. Next wipe down the sanded area with a wipe down solvent wash and dewaxer. Apply the Epoxy Barrier paint following all the manufacturers’ instructions carefully. After application of the barrier, apply the proper bottom paint. Each water type



Soda blasting uncovered hidden blisters under bottom paint

Some of the blisters are broke open and water is now seeping into the laminate causing the beginning of rapid deterioration. They need to be repaired properly and asap.

When I removed the trailer I discovered osmotic blistering on the hull in the pattern of every carpeted bunk on the trailer.



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requires different types of bottom paint. The Epoxy Barrier can then be applied by rolling or spraying. Mixing the paint product, timing and temperature are critical for a good bond. We suggest a professional to do this work.

At the very minimum a hull should have barrier coat. In my opinion this is essential if your boat is kept in the water! A barrier coat needs to be applied first and is much more important than bottom paint.

If you apply bottom paint I highly recommend applying barrier coat first. You're wasting your money if you only apply bottom paint!

Marine antifouling protective paint a.k.a. "Bottom Paint" will keep organisms from growing on your hull e.g. algae, bacteria, zebra mussels, etc. There are many types available.

Ablative – It is soft and wears away quickly. As the boat moves through the water fresh layers of paint are constantly being exposed - great for high marine growth areas. An advantage of this type is that there is minimal build up and you can apply this over most other antifouling paints. I have been told this type does not retain its antifouling ability for more than 30 days after being hauled out.

Controlled Solubility Copolymers – Partially soluble similar to ablative types. Product is also good for areas with high concentration of fouling problems. Boats can be hauled and relaunched without repainting. Obviously longevity is related to the thickness of the paint.

Hard antifouling paint – Dries to a porous film that leaches out a biocide when in contact with water to prevent attachment of marine growth. It tends to lose its effectiveness rather quickly and a hard paint film remains on the boat. After multiple applications the surface will build up and after a while it would need to be removed and reapplied. It is a good type for racing boats & sailboats that have bottoms regularly cleaned.

Self-Polishing Copolymer – contains a patented resin that reacts with salt water. Product remains effective whether the boat is sitting at the dock or is underway. Not recommended for fresh water use.

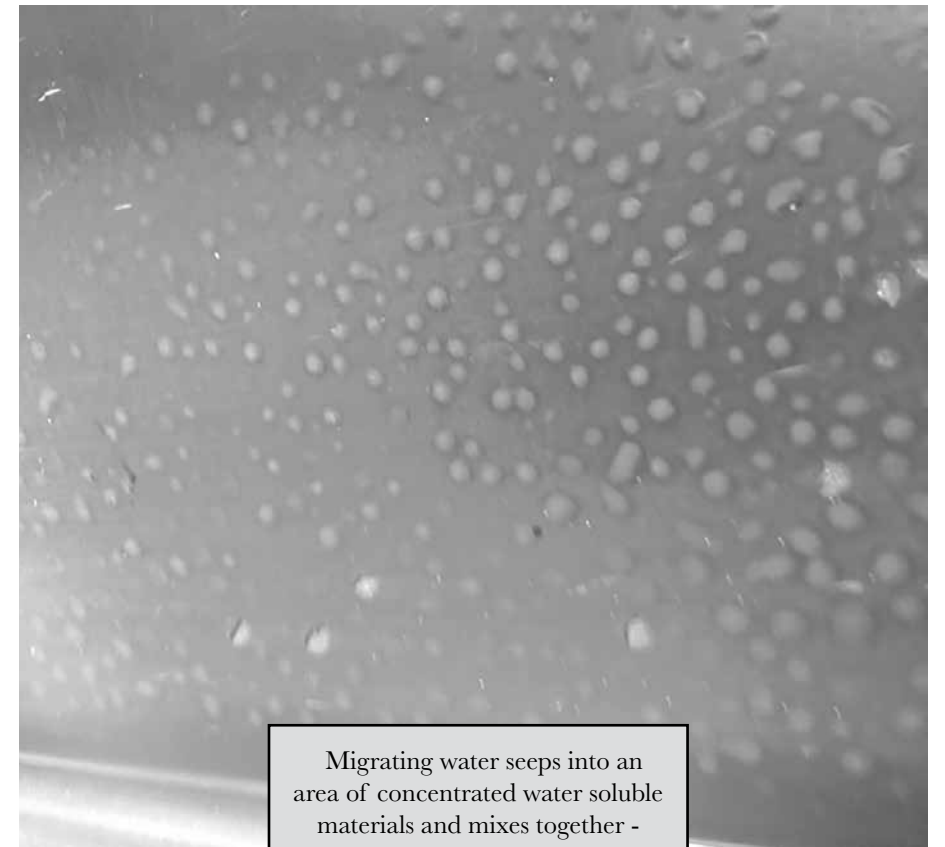
Aluminum boat owners please note! Do not apply bottom paint containing copper directly over aluminum. The results would be electrolysis upon contact with the water.

Many boat owners opt to apply these paints on their own but it's really best to hire a professional to insure good protecting results.

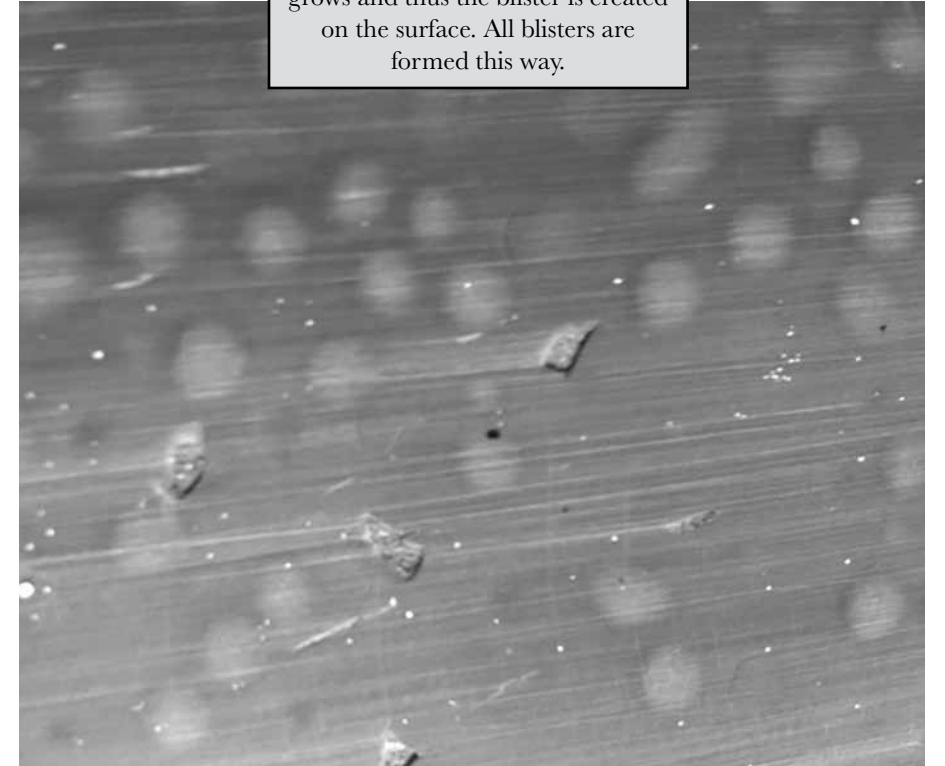
Proper hull prep and application is essential or you will again be wasting your money.

I also recommend that if you trailer your boat, keep it on the trailer or a boat lift! Get it out of the water!

Don't let it sit in the water all week long if you only use it on the weekends!



Migrating water seeps into an area of concentrated water soluble materials and mixes together - acids are formed. This acidic pasty mixture is too thick to go back out through the precocity in the gelcoat. The gaseous acid expands, pressure grows and thus the blister is created on the surface. All blisters are formed this way.



“Did you know?...“

A boat is built from the outside in? To carry out a repair the procedure is done in reverse of how it was constructed. To appreciate a successful repair it's helpful to understand how the gelcoat & fiberglass shell is made.

Boats today are made using mostly three molds. A deck mold (top), hull mold (bottom) and a pan mold; interior liner, cabin or cockpit furniture.

The first thing applied in the mold is sealer glaze A.K.A. parting material. Gelcoat is then sprayed to a more or less uniform thickness against the polished surface of sealer glaze. Gelcoat should be between 15-20 mils thick. Inconsistencies in production often occur; I have seen gelcoat so thin you can see through it and as thick as 1/4". Sometimes molds are dirty and the gelcoat finish has defects and air pockets. If there are multiple gelcoat colors they are also sprayed in reverse of what they appear on the finished product. Different color layers of gelcoat are shown in the Doral repair image. The gelcoat is then followed by one or two layers of chop strand fiberglass mat mixed together with a resin binder. Chop strand fiberglass mat is the best for ease of molding than other fiberglass material. No longer commonly used in today's production boat building due to environmental hazards the chop strand fiberglass mat was applied with a chopper gun; a tool that chops continuous strands of fiberglass into predetermined lengths and fires them into the mold along with a fine spray of resin. The chop is coated with resin on the way to the mold. Following is more on boat construction.

“Fiberglass GRP” Glass-Reinforced Plastic - Typically used for production boats because of its ability to reuse a female mold as the foundation for the shape of the boat. The resulting structure is strong in tension but often needs to be either laid up with many heavy layers of resin-saturated fiberglass or reinforced with wood or foam in order to provide stiffness. GRP hulls are largely free of corrosion though not normally fireproof. These can be solid fiberglass or of the sandwich (cored) type, in which a core of balsa, foam or similar material is applied after the outer layer of fiberglass is laid to the mold, but before the inner skin is laid. This is similar to the next type, composite, but is not usually classified as composite, since the core material in this case does not provide much additional strength. It does, however, increase stiffness, which means that less resin and fiberglass cloth can be used in order to save weight. Most fiberglass boats are currently made in an open mold, with fiberglass and resin applied by hand (hand-lay-up method). Some are now constructed by vacuum infusion where the fibers are laid out and resin is pulled into the mold by atmospheric pressure. This can produce stronger parts with more glass and less resin, but takes special materials and more technical knowledge. Older fiberglass boats before 1990 were often not constructed in controlled temperature buildings leading to the widespread problem of fiberglass pox, where seawater seeped through small holes and caused delaminating. The name comes from the multitude of surface pits in the outer gelcoat layer which resembles small pox. Sometimes the problem was caused by atmospheric moisture being trapped in the layup during construction in humid weather.” Source- Wikipedia

In doing a repair we don't have the beauty of the mold and care is taken in every step to recreate the original shape and finish. Body lines and curves in the boat are all done by hand and take a keen eye. What makes our job interesting is that every repair is unique; holes, scratches, delaminating fiberglass, impact fractures, cracks, air voids, boat pox, holes drilled in the wrong place and production defects done by the manufacturer, improper plug type repairs, failed or poorly done previous repairs, tree limbs crashing on the deck crushing gunwales and windshields, fractured transoms, rotted floors and stringers, weak winter storage roofs and temporary storage buildings crashing on boats due to heavy snow loads, one boat that came to our shop slid on its hull down I87 after it fell off its trailer. It came to a stop lying on its

side in the far left lane. The hull skidded so far that it wore through the gelcoat and fiberglass on the port stern corner to the point of being able to see inside the boat. Yes, it was repaired successfully after weeks of reconstruction.

Much thought goes into implementing a plan before our repairs are started and being familiar with the construction of a boat insures that the repair is proper and effectively done.

Take care of your vessel and it should give you years of happy boating!

Dr Gel

“Should my four year old boat have blisters on it already? The hull is just covered with them; hundreds of them. The entire boat would need to be stripped. I cleaned the boat at the end of each season with On-Off. I contacted the dealer I purchased the boat from telling him about the problem and he said I should have put bottom paint on it. The hull has a Lifetime Warranty but the Gelcoat only a year!” P.G.

I am not surprised that you have blisters on the hull of your four year old boat. I have seen them on new boats. I just repaired a one year old hull with numerous blisters and applied epoxy barrier coat on it. Luckily for the owner the manufacturer paid for the blister repair. The manufacturer will pay for all future blister problems as long as the hull has epoxy barrier on it.

Although rare, your boat manufacture may have this type of warranty.

Epoxy Barrier coat is cheap insurance when you consider the expense of doing necessary osmotic blister repairs. The best time to apply barrier is when the boat is new before blisters develop. Any age boat, especially those left in the water should be protected!

Cleaning with On-Off or any acid wash will strip the algae and micro organisms and will also strip the gelcoat protecting wax and sealer glaze. The porous gelcoat is now more susceptible to water permeation and thus creates the perfect environment for osmotic blisters to develop.

It is ok to use acid cleaners but it is essential to reseal the gelcoat with sealer glaze and wax.

Have any questions? Email me at boatrepair@aol.com
We would like to wish everyone a Happy, Healthy and Prosperous New Year!

**Merry Christmas
Happy Holidays to All!**

**Thank you for taking the time
to read “Ask Dr Gel”**

**I hope my articles have been
helpful and will continue to be!**
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