

GELCOAT BLISTER REPAIR AND PREVENTION TECHNICAL BULLETIN 1000

The following specification is for the repair and prevention of gelcoat blistering in fiberglass hulls. Close attention to detail is essential to obtain maximum results. When applied properly, the Pettit Protect system will reduce water absorption in fiberglass hulls. Many factors influence the tendency for a hull to blister, including poor manufacturing and lay-up technique, under or over catalysation of polyester resin, and water soluble contaminants in the laminate, therefore, no coating system can guarantee that gelcoat blisters will not recur at some point in the future.

Beyond the general application instructions, the painting specification is broken down into three sections based on the severity of the blistering problem. Each section is independent off the others and contains full surface preparation prior to following the general application instructions.

1. GENERAL APPLICATION INSTRUCTIONS
2. PREVENTIVE MAINTENANCE OF NEW OR NON-BLISTERED HULLS
3. REPAIR OF HULLS WITH MINOR BLISTERING
4. RREPAIR OF HULLS WITH SEVERE BLISTERING

1. GENERAL APPLICATION INSTRUCTIONS:

- 1.1. Mix both components of the Pettit Protect High Build Epoxy Primer thoroughly. Then mix the two components together in the ratio of 3 parts of Component A to 1 part of Component B by volume. Allow to stand 15 minutes at approximately 21°C before using. (Allow to stand at least 30 minutes if temperature is between 10°C and 20°C). Do not mix more material than can be used within the specified pot life shown.

Air Temperature	Induction Time	Pot Life
32°C	10 minutes	2.5 hours
21°C	15 minutes	5 hours
10°C	30 minutes	10 hours

- 1.2. Apply three coats of Pettit Protect High Build Epoxy Primer. Wet film thickness should be 175µm per coat, which yields 100µm dry film thickness. Avoid applying more than 250µm wet film thickness per coat as this may result in solvent entrapment. A wet film thickness gauge should be used to monitor paint application. Total dry film thickness (DFT) for a three coat application should be 300µm minimum for maximum coating performance. If this has not been achieved with three coats, additional coats are recommended until 300µm dry film thickness is reached. Apply the Pettit Protect High Build Epoxy Primer per the recoat schedule below.

Hull Temperature	Recoat Window
32°C	2 hours to 14 days
21°C	3 hours to 14 days
10°C	6 hours to 14 days

If the maximum dry time between coats of High Build Epoxy Primer is exceeded, you must sand the previous coat thoroughly with 80-grit production paper before applying the next coat. Failure to sand will result in poor adhesion between coats and eventual coating delamination. Recoating before the minimum dry time may result in solvent entrapment, also causing coating failure.

- 1.3. Apply the first coat of Pettit antifouling paint over the last coat of epoxy within the specified overcoating schedule shown below.

Hull Temperature	To Bottom Paint (Hours)
32°C	3 to 6
21°C	5 to 8
10°C	7 to 10

If these dry times are exceeded, you must sand the least coat of epoxy thoroughly with 80-grit production paper before applying antifouling paint or apply another coat of epoxy if recoat window has not been exceeded. Do not apply antifouling paint before the minimum dry time, as mud cracking of the antifouling may result.

1.4. Allow the system to cure thoroughly before launching the boat. Follow the recommended launch times shown below.

Temperature	Minimum Launch Time After Last Coat of Epoxy
32°C	48 hours
21°C	72 hours
10°C	120 hours

2. PREVENTIVE MAINTENANCE OF NEW OR NON-BLISTERED HULLS:

2.1. If the boat is new or has never been bottom painted, scrub the hull thoroughly with a detergent and water solution. Flush the hull thoroughly with plenty of water to ensure complete removal of the detergent solution and water soluble contaminants.

Or

If the boat has been bottom painted, remove the existing paint with a bottom paint remover made for fiberglass hulls, or remove by sanding with 80-grit production paper. All traces of antifouling paint (or any other paint or coating) must be removed completely.

2.2. Clean and prep the surface thoroughly using Pettit Bio-Blue, changing rags frequently to ensure that all contaminants are removed from the hull.

2.3. Sand the gelcoat thoroughly with 80-grit production paper. All surfaces should be a uniform dull, frosty finish. Inadequate sanding of the surface will result in eventual failure of paint adhesion.

2.4. Remove sanding residue with 120 Brushing Thinner and plenty of clean rags.

2.5. Follow General Application Instructions in Section 1.

3. REPAIR OF HULLS WITH MINOR BLISTERRING:

3.1. Remove the existing paint with a bottom paint remover made for fiberglass hulls, or remove by sanding with 80-grit production paper. All traces of antifouling paint (or any other paint or coating) must be removed completely.

3.2. Clean and prep the surface thoroughly using Bio-Blue, changing rags frequently to ensure that all contaminants are removed from the hull.

3.3. Sand the surface thoroughly with 80-grit production paper and rewash with 120 Brushing Thinner to remove the sanding residue.

3.4. Puncture all blisters and grind out any bad gelcoat or laminate.

3.5. Rinse the entire surface with fresh water to remove the water-soluble contaminants leaching from the blistered areas and let dry.

3.6. Check the moisture content of the hull with a moisture meter. Take numerous readings along the length of the hull both above and below the waterline. When the hull has approached maximum achievable dryness, the moisture meter readings will be around 2 to 3%. Do not proceed with the blister repair until all readings are below 3%, as moisture trapped in the hull will lead to further blistering and a wet substrate cannot provide permanent bonding.

3.7. Apply Ampreg 30 System following instructions for application. Apply the epoxy to the blister cavities by brush, making sure all blister surfaces are thoroughly saturated with epoxy resin. Let dry 3 to 5 hours at 25°C, then proceed to step 3.8 or allow the epoxy to cure hard and then lightly scrub it with plenty of fresh water and a Scotch-Brite pad or soft scrub brush to remove any amine blush formed during curing.

- 3.8. Sand Ampreg 30 System with 80-grit production paper and wash with 120 Brushing Thinner to remove the sanding residue.
- 3.9. Mix Pettitt EZ-Fair Epoxy Fairing Compound according to the label instructions. Knife or squeegee the compound into the blister cavities until they are flush with the surface and allow to cure hard. Wipe off excess fairing compound before it hardens to avoid unnecessary sanding. When completely hardened, sand the fairing compound smooth with 80-grit production paper and wipe clean with 120 Brushing Thinner.
- 3.10. Follow General Application Instructions in Section 1.

4. REPAIR OF HULLS WITH SEVERE BLISTERING:

Surface Preparation and Hull Drying

In the case of a severely blistered boat, it is generally recognised that complete removal of the gelcoat is necessary in order to correctly address the blistering problem. Gelcoat removal may be accomplished by grinding, sanding, sandblasting, water blasting, or gelcoat peeling. Sandblasting and gelcoat peeling are by far the fastest ways to remove gelcoat, and when performed by a skilled professional yield a surface which will readily accept the coating system applied over it. Complete removal of the gelcoat should only be performed upon the advice of a qualified Marine Surveyor.

- 4.1. Remove all existing antifouling paint and/or gelcoat by sanding, sandblasting, or gelcoat peeling. Make sure all blistered areas have been opened up and any bad laminate removed.
- 4.2. Flush the entire surface with fresh water to remove water-soluble contaminants leaching from the blistered gelcoat or laminate.
- 4.3. If the gelcoat has been peeled, it is possible that the surface may actually be too smooth and may require sanding, with 80-grit production paper. Sandblasted surfaces should be checked for adequate surface roughness as well. All surfaces should possess the equivalent surface roughness of that obtained by sanding with 80-grit production paper.
- 4.4. Clean the surface with 120 Brushing Thinner.
- 4.5. Check the moisture content of the hull with a moisture meter. Take numerous readings along the length of the hull both above and below the waterline. When the hull has approached maximum achievable dryness, the moisture meter readings will be around 2 to 3%. Do not proceed with the blister repair until all readings are below 3%, as moisture trapped in the hull will lead to further blistering.
- 4.6. While the hull is drying out, wash the surface frequently with fresh water to remove water solubles weeping from the laminate as it dries. These washings will not appreciably affect the moisture content of the hull or retard the drying process. The removal of water-soluble contaminants is critical to the success of a blister repair system and must not be neglected.
- 4.7. Apply Ampreg 60 System following instructions for application. Apply the epoxy to the blister cavities by brush, making sure all blister surfaces are thoroughly saturated with epoxy resin. Allow the epoxy to cure hard and then lightly scrub it with plenty of fresh water and a Scotch-Brite pad or soft scrub brush to remove any amine blush formed during curing. If the surface is very porous, additional coats of epoxy should be applied.
- 4.8. When the final coat of Ampreg 30 has cured hard, scrub with fresh water and a Scotch-Brite pad or soft bristled brush to remove any amine blush formed during curing and sand thoroughly with 80-grit production paper. Wipe clean with 120 Brushing Thinner.
- 4.9. Mix Pettitt EZ-Fair Epoxy Fairing Compound according to the label instructions. Knife or squeegee the compound into the blister cavities until they are flush with the surface and allow to cure hard. Wipe off excess fairing compound before it hardens to avoid unnecessary sanding. When completely hardened, sand the fairing compound smooth with 80-grit production paper and wipe clean with 120 Brushing Thinner.
- 4.10. Follow General Application Instructions in Section 1.