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Tips & Techniques for Filler Use & Selection

Filleting and Fairing

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The addition of fillers to an epoxy resin system in order to modify it for various uses is similar to having different size drill bits for one drill. No longer is it necessary to have many different resin systems around for laminating, filling, filleting, fairing and adhesive bonding. One simple resin, MAS Resin and two hardeners, MAS Fast and MAS Slow will give the builder and repairer all that is required to make the many different thickened putties for standard build and repair operations.

Making Fillets

Spreading thickened epoxy in the joints between panels makes fillets (pronounced "fill-its".) The fillets, along with the fiberglass covering them, join the panels and greatly strengthen the joint.

The size of the fillet is determined by the thickness of the laminate and the angle between the laminate panels being joined. A good rule of thumb is to make the fillets at least as 1-1/2 the thickness of the laminate being joined.

When mixing epoxy for fillets, use a filler that absorbs the epoxy, i.e., Wood flour, as it makes a stiff and strong paste. Wood flour's dark brown color also looks nice in a wooden boat.

Filleting and Trowelable Fairing Formulas

Just a mid section note - laminating epoxies, which have been optimized for fiber wetting and flow, tend to do the same thing when used in a thickened system. In order to avoid this situation the above recommendation of absorptive filler is highly effective. In addition, if Wood Flour or Micro-balloons are used in conjunction with Cab-O-Sil, the filleting material tends to stay put and will feather or pull to a finer edge and smoother surface.

In the event you are still having trouble getting your fillets and/or fairing mix to stay put, a Medium speed curing agent should be used with your resin. Medium cure speeds cut back on the allowed flow time of the resin system and the fillet gels sooner. You can either use our Medium hardener or a blend of Fast and Slow at a ratio of 50:50 for the same results.

Formulas:

Trowelable Fairing:

1 Part Resin/Hardener mix using "Medium" hardener
1 Part Cab-O-Sil or Aerosil 200
3 Parts Microballoons
Reduce the amount of micro balloons if a looser mix is required.

Filleting:

1 Part Resin/Hardener mix using "Medium" hardener
1 Part Cab-O-Sil M5 or Aerosil
2-3 Parts Wood Flour



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Additives

Colloidal Silica (AKA the brand name Cab-O-Sil) and other white fillers may be added to make the wood flour paste match the color of the plywood exactly. Adding some microballoons or Colloidal Silica (no more than 30 percent by volume) has the added benefit of making wood flour fillets smoother and easier to spread.

Often two fillers used in conjunction are more effective than any single filler used alone. This can be attributed to the synergistic effects found when two different particle size ranges are blended together.

Remember to mix the epoxy resin and hardener thoroughly before adding the thickening powder. Make a paste that is about the consistency of peanut butter. The paste should be smooth (not chunky) and spread without "pulling".

One secret to making good fillets is having the right tools. These are simple spreaders cut from thin plywood or from inexpensive auto body putty spreaders (available in any auto parts store). Make an assortment of tools. Long popsicle sticks are particularly useful for making fillets in narrow sections of kayaks and rowing shells. Distribute lumps of epoxy along the seam to be joined. Push the epoxy along the joint with a spreader. Carefully scoop up any epoxy that squeezes past the sides of the spreader. Scrape up any epoxy that's not part of the fillet; it's best to scrape excess epoxy up now rather than sand it off later. PVC pipe dipped in lacquer thinner and held at an angle quickly swiped is an effective tool and technique for pulling a really smooth fillet.