

CHOOSING THE RIGHT RESIN – POLYESTER RESIN

Polyester Resin is a liquid which when the catalyst is added, will cure to a solid. It has been specially formulated to cure at room temperature. The hardener, usually MEKP (Methyl Ethyl Ketone Peroxide) is added to begin the curing process. When polyester resin “cures”, it goes through a polymerization process. This process brings it from a liquid state to a solid state. The “polymerization” involved is the connecting of molecules in a grid pattern, which is permanent and results in the resin going from liquid to solid (hard). The MEKP hardener begins this process. Always consult the manufacturer’s instructions for mixing the correct proportions of resin to hardener. Factors that will affect the hardening time and working time are temperature, thickness of the application, quantities of resin mixed per batch and humidity.

Hardeners for polyester resin, often referred to as catalyst, come in small plastic tubes or bottles with graduated measurements marked on them. Hardeners are measured in drops or fractions of teaspoons for most lay-up or repair jobs. Consult manufacturer’s instructions. *Do not over-catalyze or under-catalyze* -- you may ruin the resin and have to start again. This will only cause further problems.

Polyester resins have a limited shelf life of one year. Therefore, be sure to purchase fresh resin and try to use it within six months from the time you purchased it. Never return mixed polyester resin, (that which has been catalyzed), to the container of unmixed resin. Discard the unused mixed or catalyzed resin.

There are two general types of polyester resin used for repair. Laminating or Bonding resin which cure to a tacky surface and Fiberglass or Marine Finish resin which cures to a non-tacky surface.

Laminating resin (Evercoat # 100560, 100561) is used for initial coats on wood or for multiple applications with fiberglass cloth or mat. This resin is air-inhibited which means it will cure to a tacky finish and does not require sanding between coats. This is desirable in laminating because the layers adhere to each other better. This product should not be used as a final coat unless measures are taken to seal out the air during the curing process.

Marine and Fiberglass resin (Evercoat # 100553, 100552, 100554, 100517, 100518, 105499, 105498, 105500, and 105501) is non air-inhibited or **waxed resin**. It is for the final coat. This resin cures with a hard non-tacky surface. When the catalyzed resin is applied as a final coat to the laminate coats of resin, the wax rises to the top, sealing off the air and allows the resin to cure to a hard finish, which can then be sanded, painted or gel coated.

NOTE: Cannot be used with aluminum, redwood and/or close-grained woods like oak or cedar. Do not use with Styrofoam.

POLYESTER RESIN REPAIR PROCESS

Preparing The Surface

Remove all grease, wax, dirt, and other foreign material from repair area. Use a paint stripper or sand off any paint. Wipe area clean with acetone or non-residual solvent.

If repairing a hole, cut or grind away all loose or damaged material. Sand several inches beyond repair area and taper edge of hole. Tape a wax paper covered piece of cardboard to the backside of the hole to be repaired. Cut Sea-Glass cloth or mat to overlap repair area by at least 2". If multiple layers of mat or cloth are going to be used, make each layer slightly larger than the last. **NOTE: BOAT YARD, BOATER'S CHOICE and HARDWARE RESIN MUST BE USED WITH FIBERGLASS CLOTH, MAT or TAPE. PREMIUM MARINE RESIN CAN BE USED ON ITS OWN.**

If covering a surface make sure the surface is clean, dry and sanded. Remove any paint and wipe area with acetone to remove any contaminants. Cut Sea-Glass cloth or mat slightly larger than area to be covered.

Mixing The Material

Add hardener to resin just before using and stir for one minute. Never mix more than a quart at a time as it starts setting up in about 17 minutes and should not be used after it starts to gel (harden).

Mix resin and hardener using the chart below:

Required Hardener per Amount of Resin		
Per Fl. Oz. of Resin	Per Quart of Resin	Per Gallon of Resin
12 drops of hardener	11 cc. of hardener	40 cc. of hardener

Application

Application should only be made on a perfectly dry surface. When applying laminating resin over wood, the first coat may soak in. Apply a second coat and wait until it gets sticky before laying Sea-Glass mat or cloth.

Using a paint brush or plastic spreader, apply resin/hardener mixture to the Sea-Glass mat or cloth. Work the resin into the fiberglass until the white fibers

disappear. Additional layers of mat or cloth can be applied before the mixture gels. Cured surface must be sanded before re-coating or painting.

After the Resin Has Cured (Hardened)

Once the repair has hardened (at least 6 hours) sand down excess resin (120 grit) and any protruding fibers and apply a light coat of marine resin with hardener or use **Evercoat® Formula 27 All Purpose Filler** (#100570, 100571, and 100572).

Sand final surface with 180 grit before applying paints or gel coat.

For large jobs, **Evercoat® Marine Laminating Resin** (#100560, 100561) should be used for initial coats. **Laminating Resin** remains tacky when cured, which will hold the cloth or mat in place and does not require sanding between coats.

Notes:

- **Fiberglass cloth, mat, or tape must be used with polyester resin.**
- Use only enough resin to completely wet out the cloth or mat. Excess resin that has “puddled” on top of the cloth or mat will eventually crack.
- For fiberglassing over redwood, cedar, oak or other oily or close grained woods, **Evercoat® Everfix Epoxy** (#100642, 100643, or 100644) or **Everstar®Epoxy Resin System** (#100620, 100621, 100623, and 100624) will provide the best adhesion.
- Never return resin mixed with hardener back into the can.
- Use **Evercoat®Acetone** to clean brushes, tools and equipment before resin gels.
- If desired, use **Evercoat® Coloring Agents** to tint the resin. Tinting may not yield the exact color match. Coloring Agents should be added prior to catalyzation at a maximum of 1 oz. per quart.
- Excessive brushing or applying in direct sunlight can cause resin to cure tacky.

Reinforcement Type		Percent Reinforcement		Percent Resin
Mat	1.5 oz. per sq. ft.	40%	1.5x	60%
Cloth	5.5 oz. per sq. ft.	50%	1.0x	50%

Woven Roving	24 oz. per sq. yd.	60%	0.67x	40%
Alternate Math/Cloth		30%	2.33x	70%
Mat & Woven Roving		40%	1.5x	60%

Clean Up

Clean all tools and brushes with Evercoat Acetone as soon as you are through to prevent resin from hardening on them.

Note: Polyester resins cannot be used to repair thermoplastics (i.e. Tupperware® or molded toys). Thermoplastics include polyethylene, polypropylene, acrylic, PVC, ABS.

POLYESTER RESIN VERSUS EPOXY RESIN

Characteristics	Polyester Resin	Epoxy Resin
Flexural Strength	Good	Best
Tensile Strength	Good	Best
Elongation %	Good	Lowest
Water Absorption	Good	Lowest/Excellent
Hardness	Good	Best
Pot Life	4 – 7 Minutes	14 – 20 Minutes
Working Time	20 – 30 Minutes	½ - 6 Hours
Above Waterline	Yes	Yes
Below Waterline	Yes	Yes
Major Construction	Yes	Yes
General Repairs	Yes	Yes
Shelf Life	18 –24 Months	2 Year +
Catalyst	MEKP	2-Part System
Cure Time	6 – 8 Hours	5 –7 Days

TROUBLESHOOTING: POLYESTER RESINS**TINTING:**

Only color agents made specifically for polyesters should be used when tinting or coloring polyester resin. Any chemical foreign to the polyester can interrupt the curing process and damage properties. No more than 1 ounce of color agent to a quart of resin should be added. Tinting the resin may not yield an exact color match.

THINNING: We do not recommend thinning the product.

COMMON PROBLEMS WITH POLYESTER RESIN APPLICATIONS

Problem: Resin is sticky all over after hardener has been mixed into the resin and proper cure time has elapsed.

CAUSE #1: Incorrect mixing ratio was used when combining resin and hardener. Use 12 drops of hardener per ounce of resin; 11 cc of hardener per quart of resin or 40cc of hardener per gallon of resin.

CURE: Scrape off as much of the uncured resin as you can. You can use acetone to clean the surface of any residue of uncured resin. Follow with an application of properly mixed resin.

Problem: Resin is still tacky (a finger leaves a fingerprint) after hardener has been mixed into the resin and proper cure time has elapsed.

CAUSE #1: The clear Hardener (Catalyst) that comes with the resin can lose some of its potency or power with time, and/or adverse storage conditions.

CAUSE #2: If BOATYARD (100517, 100518), BOATERS CHOICE (105501) or HARDWARE RESIN (105499, 105498, and 105500) were used without fiberglass material, the resin may not cure to a hard surface. These resins require the use of fiberglass material.

CAUSE #3: May have selected the incorrect resin for the project.

CURE #1: If BOATYARD (100517, 100518), BOATERS CHOICE (105501) or HARDWARE RESIN (105499, 105498, and 105500) were used without fiberglass material, follow with an application of properly catalyzed Premium Marine Resin (100553, 100552, and 100554). The Premium Marine Resin can be used without fiberglass material.

CURE #2: If finish resin (top coat) is desired, make sure you don't purchase and use a laminating resin (un-waxed resin) designed for multiple coats of application (Evercoat #

100561, 100560). As this resin is designed to remain tacky until a finish resin is applied.

CURE #3: Put a heat lamp on the repair area at 120F two feet away from the surface for a period of 2 hours. If the resin does not respond by hardening further, proceed to CURE # 4.

CURE #4: Increase hardener amount by 50% the required amount on the can's directions (18 drops of hardener per ounce of resin, instead of 12 drops), or ask place of purchase for the most recent shipment of hardener.

COVERAGE, CURE TIMES, APPLICATION SUGGESTIONS.

Product (Product Number)	Coverage per gallon @ 10 mils	Working Time / Apply Second Coat	Fully cured	Important Notes
Premium Fiberglass Resin (#100553,100552, 100554)	160 sq. ft. 50 sq. ft. with one layer of Sea Glass cloth	15 minutes / Before gel or sand between layers	4 to 6 hours	<ul style="list-style-type: none"> Will not adhere to aluminum or close-grained woods. For these surfaces, use an epoxy resin.
Economy Fiberglass Resin (BoatYard, Hardware Resin -- #100518, 100519, 100517, 105499, 105498, 105500)	160 sq. ft. 50 sq. ft. with one layer of Sea Glass cloth	15 minutes / Before gel or sand between layers	4 to 6 hours	<ul style="list-style-type: none"> Must be used with fiberglass material like cloth, mat or tape. May not cure properly when used without the fiberglass materials.