

Clear Finishing of Outdoor Wood

For many years builders of wooden boats have used a combination of two-part epoxy resins and marine spar varnishes to make "furniture quality" clear-finished watercraft. That these boats look good after several years of outdoor exposure is testament to the synergistic effect of using these products together. The same techniques can be used to protect many wood projects, allowing them to be left outdoors uncovered for months at a time without fear of the finish failing, the wood warping, splitting, or discoloring, and joints coming apart.

Clear Coat™ and SilverTip Epoxy offer excellent barriers to both liquid and moisture vapor. They are easy to apply with a brush or a roller, and will cure to a tough, clear, high-gloss film which will waterproof the wood. But the epoxy film does not protect the wood from sunlight. In addition, exposure to the sun will dull, darken, and eventually degrade the epoxy coating underneath. To avoid ultraviolet light damage, and offer complete protection to the wood, overcoat the epoxy with either one of System Three's clear finishes.

System Three Marine Spar Varnish™, a high gloss/silky satin, high-solids, "oil-base" finish, is designed for marine and exterior wood surfaces. Our Spar Varnish is a polyurethane formulation, and contains ultraviolet light absorbers which will keep wood looking beautiful even with constant exposure to sunlight. It was formulated specifically to cure properly over System Three epoxy resin products.

System Three WR-LPU™ Marine Topcoat, a two-part, waterborne, polyurethane enamel, will provide performance equal to its solvent-borne counterparts. Like our Spar Varnish, it contains UV-absorbers. WR-LPU topcoat comes in clear gloss and satin, is extremely weatherable and abrasion-resistant, and will retain its properties for long periods in a variety of environments.

Is your outdoor wood project a candidate for System Three's protective coatings?

Not all outdoor wood applications are suitable for System Three's protective coatings. The best candidates are those that have surfaces which are easily accessible on all sides. Complex wood components that have difficult to access surfaces should be avoided. In these scenarios, surfaces can be nearly impossible to coat with a sufficient amount of epoxy. This shortage of epoxy will leave the wood component susceptible to moisture cycling, which in turn will lead to premature failure of both the epoxy and the UV protective top coat. Complex wood components are best protected with coatings such as exterior penetrating oil finishes or stains which don't leave a film on the surface.

Substrate Preparation:

Wood substrates must be clean and verifiably dry before coating can begin. High moisture content can be problematic and should be avoided until moisture levels drop to 12% or less.

Sharp edges and outside corners are difficult to coat and more times than not, inadequate film build results, which provides too little protection from moisture. To prevent potential failure of the epoxy, edges and outside corners should be slightly rounded over. Round over the edge with sandpaper or use a router and a small radius round over bit. Sand with 180-220 grit sandpaper. Remove sanding dust from the wood substrate with clean shop air or a vacuum.

If staining, oil- based wiping stains have proven to work well with System Three Epoxies. This type of stain requires a full 7 day dry before beginning epoxy application. It's recommended to first make up a sample to ensure the results meet your expectations.

Measuring and Mixing:

Measure by volume 2 parts Resin (Part A) to 1 part Hardener (Part B). Pour Part A into a clean, graduated mixing cup. Pour Part B on top of Part A. Thoroughly hand-mix the material from the bottom to the top and scrape the sides of the container as well as the mixing stick.

It's best to start with small 3 - 6 ounce batches to prevent loss of material. Pour contents into a paint tray or disposable pie tin. Spreading out the epoxy prevents heat buildup and therefore increases the pot life.

Application:

Seal Coat:

System Three Epoxies are best applied with a 1/8" nap foam roller and disposable natural bristle brush. Use the natural bristle brush to reach areas the roller cannot. Optimal results are attained when the wood substrate is sealed with a very thin layer of the System Three Epoxy at ½ fluid ounce per sq. ft. Once the seal coat has cured, inspect the surface. The surface should be uniformly glossy throughout. If dull, dry areas are present, an additional thin seal coat is necessary.

Build Coats:

Once the wood is sealed, additional coats can be applied. Aim for 1-2 fluid ounces per sq. ft. Vertical surfaces require thin coats to prevent runs or sags. 2-3 coats of epoxy should be applied after the seal coat for maximum exterior durability. Large vertical areas may require 3-4 thin coats.

Allow the epoxy to cure for 48 hours in ambient room temperature conditions before sanding. Sand the epoxy with the finest grit that efficiently levels the surface. Best results are achieved by using a hard-backed sanding block or random orbital sander with a dense rubber pad. When sanding, be sure to maintain the proper grit sequence. Failure to maintain grit sequence can end in scratches showing through the top coat. Sand up to 220 grit for satin finishes and 320 grit for gloss finishes.

Did you know:

- System Three Epoxies have a 72-hour window in which sanding is not necessary between coats.

- Unlike other finishes, you can apply System Three Epoxy over itself, even when the prior coat is still tacky.

Tips for success:

Sanding between coats of epoxy is generally not advised, as the sanding dust produced is very persistent and difficult to remove from porous grain. If not completely removed, fine white specks will show on the next coat. If sanding is necessary, use 150 grit sandpaper. Fine sanding dust can be removed with careful use of clean shop air or a good quality vacuum. Wipe the surface with denatured alcohol.

UV Protective Top Coats:

Maximum exterior durability is achieved by applying at least 3 coats of a high-quality UV protective finish.

Marine Spar Varnish:

Apply the varnish with a high-quality, natural bristle varnish brush. Spar varnish can be thinned with mineral spirits for easier application. Brush the varnish in thin, uniform coats with long, slow brushstrokes. Recoat without sanding within 12-24 hours. If sanding is required, use a fine grit (400-600).

Spar Varnish can also be spray applied. Best results are achieved using a fine orifice tip, ideally around 1mm for conventional and pressure pot setups. Thinning is not usually necessary but can be done with mineral spirits.

Some spar varnishes are not compatible with epoxy. If using a varnish other than the System Three brand, be sure to test ahead of time to determine compatibility.

Allow Marine Spar Varnish 12-14 days to cure time before putting into service.

Tips for success:

Wet sanding with water or mineral spirits helps keep dust from becoming airborne, resulting in a cleaner work environment and potential dust contamination in the finish.

WR-LPU:

The WR-LPU can be applied by roller, brush, or spray application. For roll and tip applications, thin with water at 5-10% by volume. Use a high-quality synthetic tipping brush coupled with an 1/8" foam nap roller. Further details are available in the Paint Application Guide.

For spray applications, best results are achieved by using a pressure pot or airless (or air-assist airless) setup. Use a 1mm tip with the pressure pot, and thin with water up to 25% by volume. With the airless setup, use a fine finish tip at .009-.011. No thinning is necessary with airless spray.

Allow WR-LPU 7 days cure time before putting into service.

Tips for success:

Roll and tip application:

Ideal application conditions range from 60-75°F and humidity above 50%. Avoid coating in direct sunlight or breezy conditions, as this will cause the WR-LPU to set up too rapidly. Apply the paint consistently and evenly. Avoid overworking the paint, as this will cause the paint to set up prematurely. You will see best results by applying no more than 2 coats a day. Coat in the cool times of the day, such as early AM and late in the PM.

Spray application:

When spraying WR-LPU, the first coat should be applied ultra-thin. Applying the first coat too heavy will result in craters. After 15 minutes, apply a medium wet coat. Wait 2 hours before applying the next coat. Subsequent coats should be applied in the same manner.

Maintenance:

Exterior furniture should be put into storage in the winter months when not in use.

When the UV protective coating begins losing its luster, plan on recoating soon. Allowing the UV protective coating to degrade too much will result in damage to the protective epoxy coating.

Simply clean the surface with hot, soapy water, taking care to remove dirt, and loose debris. Sand the surface with 220 grit paper, and then thoroughly clean. Apply at least 2 coats of a quality UV protective coating.

To prevent excessive wear to the epoxy coating on table and chair legs, consider the use of tap-in glides.

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