

# **Protective Coatings and Maintenance**

## **Using West System® Brand Epoxy**

### **Sunlight and protective coatings**

Sunlight poses a threat to the structure and finish of all composite boats. It attacks in two ways: heat and ultraviolet (UV) rays. Any epoxy finish without protective coatings are vulnerable to ultraviolet degradation. WEST SYSTEM® Brand epoxy, including the 207 Special Coating Hardener, is not intended to be used as a final finish. Therefore, it is recommended to cover bare epoxy that will be exposed to direct sunlight as soon as possible with an opaque paint or an ultraviolet inhibiting coating. If the surface is to be painted, add pigment to the last two coats of epoxy to protect the surface. Surfaces that receive indirect UV exposure, such as those below decks, will last much longer without a protective coating than directly exposed surfaces.

While a clear coating has an inherently shorter lifespan than a paint finish, there is a tradition among wooden boat owners of using clear coatings to preserve and enhance the natural beauty of wood. For many, the major attraction of wooden boats is the beauty of wood itself and they are willing to invest a lot of time and money to achieve near perfection in their wood finishes.

Unfortunately, due to the exposure to the sun, these beautiful finishes seldom last forever. The boat must ultimately be stripped down and recoated, usually at great expense. Because of this, owners want the finish to have the longest possible lifespan.

The first phase of finish breakdown is loss of gloss, so surface gloss retention is essential for coating longevity. Breakdown of a clear coating by sunlight has two root causes. The first is the gradual breakdown of the coating material. The second is the slight chemical and physical change which takes place within the surface wood cells affected by the sunlight through the clear coating. It is thought that this change in the wood cells contributes to the coating failure by promoting a physical separation of an already weakened coating from the wood surface.

We are often asked how long a coating will last over a wooden surface. The answer is not simple, because the lifespan of any coating depends on many factors. We consider the following to be the most important:

1. The number of hours of exposure to sunlight in a given climate. Cloudy climates are less hostile than sunny climates. A location in the Southern Mediterranean is far worse than one in Northern Europe because on average the solar radiation in the Southern Mediterranean is less filtered by the atmosphere.
2. The angle of the exposed surface to the sunlight. For example, a deck will receive much more direct radiation at high noon, when the destructive UV rays of the sun are most damaging, than would cabin sides.
3. Highly glossy surfaces are more reflective of UV rays (and thus less vulnerable) than are dull surfaces, no matter what the colour.
4. Lighter coloured woods are more reflective than darker coloured woods, just as lighter coloured paints are far more reflective than are darker colours.
5. Thicker clear coatings last longer and offer more protection than thinner coatings.
6. Varnishes with large amounts of UV inhibitors last much longer than varnishes without this additive. Modern two-part polyurethane varnishes last longer than the more traditional phenolic varnishes.

7. A high-strength epoxy resin undercoating, such as WEST SYSTEM 105/207 mix, when used as a saturation coat under a varnish, provides a greater lifespan than the use of varnish alone. A bonus is the dramatically improved moisture resistance.

Apply a minimum of three coats of WEST SYSTEM epoxy for moisture resistance and to provide a smooth base for clear coating or paint. If sanding has been carried out between the coatings, apply further coats for a maximum recommended thickness of between 375-500 microns for a deep, long-lasting finish (each coat provides approximately 125 micron thickness).

We recommend WEST SYSTEM 207 Special Coating Hardener be used for the highest quality, longest-lasting clear finish. 207 contains a UV filter that improves the ability of the mixed 105/207 epoxy to resist the harmful effects of sunlight without compromising moisture resistance. If a clear finish is not required, select the hardener (205, 206 or 209) that meets the needs of the job in hand.

The following are specially applicable directions for using 207 Special Coating Hardener to prepare for a deep lustrous finish in the fastest possible time:

1. Sand and fair the wood surface using 80-grit or finer paper. Always sand in the grain direction.
2. Apply a saturation coat of 105/207 to the bare wood surface and allow to cure thoroughly at room temperature. The cured saturation coat will cause the wood surface to "swell up" and feel rough. Dry sand or scrape the swelled wood grain to a moderate smoothness. (Be careful to avoid sanding through this initial saturation coat through excessive sanding).
3. Apply a second coat of 105/207 using the roller and foam brush method. Level out the coating as much as possible.
4. Apply a third coat as soon as the second coat has reached its initial cure (at least 90—120 minutes at 18°C). Take extra care to apply thin, even coats to prevent runs or sags. Add any number of coats to build up the desired coating thickness. Be sure to level out each coating with the foam brush.
5. Allow these coats to cure fully. The cure can be accelerated with moderate heat, but too much heat may cause bubbling.
6. Wet sand the cured 105/207 epoxy surface to a 220-grit or finer finish. Rinse the surface with clean water. Rinse water should sheet evenly, without beading or fisheyeing. If rinse water beads up (a sign of contamination), wipe the area with solvent and dry with paper towels, then wet sand again until beading is eliminated. Proceed with the finish coating after the surface has dried thoroughly.

## **Applying clear coatings**

Even though a properly applied 105/207 coating may have a high gloss finish equal to that of a good varnish, we recommend that this surface be coated with a top quality varnish for UV protection and maximum performance. Two-part polyurethanes bond well to cured WEST SYSTEM epoxy surface and provide great hardness and durability whilst still retaining a high-gloss, UV-resistant surface.

1. Thoroughly mix the two-part polyurethane varnish in the correct ratio.

2. For major applications over large surface areas, always use the 790 Foam Roller which will give a more uniform application in less time. This means runs are less likely during application and there will be more time to touch up the coating later.
3. For smaller areas or surface inaccessible with a roller use a high quality brush with a tapered tip, 50mm to 75mm wide, depending on the intricacies of the surface to be coated.
4. During application, the roller will leave a slightly stippled surface with some air entrapped in the coating. In most instances this stipple will flow out and the bubbles will disappear to leave a smooth, high-gloss surface upon cure. In some conditions, it will be necessary to brush out the rolled-on coating to assist the levelling process. Do this by lightly brushing the surface with smooth, even strokes as soon as possible after applying the varnish. Be aware that the time available to perform this "tipping off" will vary by climate. Cooler temperatures should allow approximately 5 minutes to tip off a newly applied coating with no difficulty; hot, dry conditions will allow much less time.

We are often asked how many coats of varnish should be applied. The answer is the more the better, with the important understanding that the final coat always needs a high gloss for longevity. Initially apply two or three coats over the 105/207 epoxy base and a new coat every second or third year to assure a continued glossy surface. This approach not only renews the surface to a high gloss, but also takes care of any defects or scratches whilst maintaining the UV protective barrier. Thus it has the potential to provide an extremely durable finish.

For health reasons we do not recommend spraying two-part polyurethane. Inhalation of fumes, dust, vapours and droplets must be avoided. Spraying of marine paints in general is not recommended except if done by a trained professional with industrial grade equipment and only in properly ventilated areas.

## **Paint**

Alternative finishes are fully pigmented paints. Pigments filter out all or most of the harmful UV rays, thus protecting the substrate. However, a slow oxidation of the surface occurs over many years, causing it to lose its gloss. Light coloured paints are more reflective and maintain their gloss longer than darker colours. Protecting the substrate from heat is another important reason to choose lighter colours.

There are a number of different types of paint systems available including enamel, polyurethane (both one and two part) and linear polyurethane. Some coatings are more durable than others, whilst some can be hazardous to apply. The more recently developed linear polyurethanes (LP) are superior to any other paint we have used. We recommend them as the best painting system to use over a cured WEST SYSTEM epoxy surface. The LP systems have excellent resistance to sunlight, salt spray and other weathering factors. They possess outstanding abrasion resistance and hardness that can equal or surpass that of polyester gel coat. Best of all, LP paints bond well to a cured WEST SYSTEM epoxy surface. We recommend contacting a reputable paint manufacturer to seek advice on the best paint system available to meet the needs of the job in hand.

Always follow the instructions from the manufacturer of the paint. Nevertheless, it is recommended to make a test panel to evaluate the degree of surface preparation required, the compatibility and the handling characteristics of the finish system.