



## **General Wet Layup Laminating Procedure and Tips Using Super Sap® CLR and 100/1000 Epoxy Systems**

In this tutorial we use surfboard lamination as the example but the same procedures can be used for laminating and coating other substrates such as wood, foam, or other types of core materials.

Choosing the Right System for Your Application:

### RESINS

#### **BRT Epoxy Resin + Any Hardener (CLX, CLF, CLS)**

- Best For Clear Laminations & Hot Coating over White Foam Cores.
- BRT contains Optical Brighteners that fluoresce under UV light exposure & Daylight.
- DO NOT use over Dark color laminations or Dark wood, as the Optical Brighteners will make fiberglass and rice paper lams look white over the dark colors

#### **CLR Epoxy Resin + Any Hardener (CLX, CLF, CLS)**

- Best for Clear Laminations and Hot Coats when using colors and tints ( including dark colors: black, blue, green, etc.)

### HARDENERS

#### **CLX Hardener**

- Fastest curing system, Ideal working temps above 72 °F
- Best in class clarity and UV Yellowing Resistance
- Gloss coating possible when shop temps are 72 °F or higher
- For temps cooler than 60 °F, and at times of high humidity (> 90%), CLF recommended instead of CLX

#### **CLF Hardener**

- Fast curing system and low blush coatings even at colder temps (50 °F)
- Gloss Polishable for gloss coatings
- Best in class clarity and UV Yellowing Resistance

## CLS Hardener

- Slow curing system design for low exotherm during fin box installs into foam
- Higher viscosity for easier processing at higher working temps (>90 °F)

### Wet Layup Laminations of Light Weight Fiberglass:

- Ideal temperature for epoxy work is 72-80 °F. Colder or warmer temperatures will affect pot life, viscosity, and cure times. Best results will be achieved if you can pre-warm and equilibrate the resin and workshop temperature to the above range before beginning work.
- Although our resin mix ratios are forgiving within 2-5% error, we recommend using a scale or graduated plastic cups (HDPE) to weigh out the proper ratios by weight, or volume (roughly 2:1). One side of a standard 6'0" shortboard using 2 layers of 4 oz. 'E-glass' will need roughly 12-16 oz of mixed resin, depending on the applicator's technique and experience. A 9'0" longboard will typically need about 22-28 ounces of mixed resin per side over 2 layers of 4 oz. fiberglass.
- Mix the epoxy (A side) and hardener (B side) well with a large mixing stick (2-3 minutes) without introducing too many bubbles. Be sure to scrape the sides of the mixing container to achieve an even mixture and proper cure. Although both Super Sap CLR and 100 Epoxies come equipped with built in air release agents, avoid creating foamy bubbles when mixing. If bubbles are introduced, you can allow the resin to sit in the cup for roughly 2-3 minutes while bubbles escape. Monitor the resin's temperature and make sure it does not begin to exotherm (gets very hot due to reaction chemistry).
- Pour out 3/4 of the resin down the middle of the board surface moving from one end to another. Then leave about 1/4 of the resin in the cup to use for laminating the rails.
- A medium to hard squeegee (yellow plastic) can be used to move the resin around the fiberglass surface. Epoxy should be allowed to soak into the fiberglass on its own and does not need to be squeezed on with much force. Overworking the resin should be avoided as it can introduce small bubbles, foaminess, and/or cloudiness into the resin. If this does occur, a hair dryer or small propane torch can be used to pop bubbles and clear cloudiness from the lamination. Be sure NOT to keep the hair dryer or small propane torch in one place too long, as this could melt or cause out-gassing of the foam.
- Spread the resin evenly on the flat areas first at a steady, even pace. Start in the center along the stringer line, moving from tail to nose or vice versa. To achieve the smoothest lamination possible, always apply the squeegee moving the resin progressively outward toward the rails with each lengthwise stroke. Do not overwork the resin. If foamy resin does develop, avoid reintroducing it into the fiberglass. Foamy resin can be set-aside in a separate cup, and a hair dryer can be used to reduce the foaminess and remove bubbles.
- Once the flat areas are totally wet, begin to wet the laps. Apply the resin out toward the rail edge in quadrants.

- After the laps are wet out, use the squeegee to pull excess resin off the flats. Once the flats are evened out, the laps can be tucked, and excess resin pulled off with a squeegee.
- Hot coats may be applied over the lamination layer once the resin is fully set (after 2-3 hrs at 72°F/ 20°C). If laminations have dried more than 24 hours, the surface should be lightly scratched with 80-100 grit sandpaper to create a mechanical bond between the lamination and hot coat.
- Tints and pigments that are compatible with epoxy and/or polyester resins are compatible with Super Sap®. Since the 100/1000 system is amber colored, it should be treated as a pre-tinted resin. A small addition of white tint can help hide any inconsistencies in the lamination or blank.
- NOTE: Some brands of tints have an adverse reaction with epoxies in general, and may change from their original color, particularly browns, reds, and magentas. Always test a small amount of resin with any new tint prior to application on a finished product. Computer ink-jet printed color logos on rice paper may bleed during lamination. Also, some green inks may fade when used with 100/1000 system. We suggest using only black ink, or avoiding shades of green & blue, if using computer ink-jet printing. We highly suggest using professionally silk-screened or laser printed logos on rice paper.

#### **Thin Film Coating, aka Hot Coating:**

- Hot coating should ideally be done at temperatures at or below 75 °F, usually in the mornings or evenings, when it is cooler. Temps above 75-80 °F can lead to increased chances of fish-eyes or dimples in the hot coat, due to reduced surface tension.
- For tack free and sandable surfaces, you may use 1-2 cc or 1-2 ml per oz of hardener of surfacing agents designed for use in epoxies (typically Xylene/Wax solution, for best results use @ 72 °F, < 70% humidity).
- Mix by stick (2-3 minutes) at slow speed to minimize bubbles. Be sure to scrape the sided and bottom of the cup. If many bubbles are introduced, allow the resin to sit in the cup for 1-2 minutes, making sure it does not exotherm (overheat) in the cup. By allowing the resin to pre-warm in the cup (aka "induction") the resin will achieve an ideal temperature and viscosity for hot coating applications.
- OPTIONAL: To help give the smoothest brushed hot coat possible, you can first apply a thin "cheater coat" over the glass lamination by applying a small amount of resin (3-4 oz per 6-7 ft board) using a soft flexible squeegee. Allow the cheater coat to tackify (~1-1.5 hrs @ 72 °F / 20 °C after application), but NOT fully dry to a tack free finish. A brushed hot coat should be applied immediately after the cheater coat begins to tackify. If the cheater coat does cure to a hard, tack-free film, the surface should be prep sanded with 80-100 grit sandpaper to create mechanical bonding with the next hot coat.
- Using a 3" chip brush, resin should be spread tip to tail in smooth, slow, even strokes with medium pressure. Pour the resin starting in the middle of the board, working out to the rails. Try to avoid moving the brush too fast or too lightly across the board, as this may introduce bubbles.

- Cross strokes (45 degree to the stringer) can be used to even out resin, followed by finishing strokes tip to tail. Again try to not overwork the brush and avoid introducing bubbles.
- A hair dryer or small propane torch can be used to pop small micro bubbles or foamy areas. Quick brush like movements back and forth using the hair dryer or torch should pop most bubbles. Give the resin adequate time to self-level and it should cure to a smooth glossy finish.

#### **Finish Sanding and Gloss Coat Polishing:**

- CLR/ CLF is recommended to give the highest possible polish/ gloss finish.
- A primary hot coat should be applied, and then sanded back as smooth as possible to 100-150 grit to create a mechanical bond with the following gloss coat.
- Surfacing agent can help to achieve a smooth gloss coat, and should be applied during cooler temps (< 75°F). Gloss coating at temps > 80 °F should be avoided to prevent fish-eyes and dimples due to decreased surface tension. Use 1-2 cc or 1-2 ml of surfacing agent per oz of hardener.
- Once both top and bottom are cured, the resin can be buffed out starting at, no less than 400 grit. Wet sanding with 800, and followed by 1000, and then surfboard polish with a buffing pad should create a shiny polished surface.