

Kelsall Swiftbuild Sandwich & Vacuum Resin Infusion Process

"THE BEST NEWS EVER for the custom boat builder. Even after 30 years, I admit to a certain excitement at the significance of what I have seen today."

Derek Kelsall 2003

Since 1973, a few thousand panels of glass/foam sandwich have been produced on a mould table for Kelsall Panel methods of boat building. Dozens of panels have been made at KSS workshops and projects around the world, since 2001. Some 20+ hulls were made ranging up to 60ft. They were all hand lay-up, using vacuum to ensure a good bond between the foam and the glass skins. It has been described as the 'romance of boat building'. Sticky odiferous resin, dripping onto floor and shoes, spreading out glass and positioning wet foam sheets onto a wet table, all done with the clock ticking to the gel time of the last mix of resin. We accepted the discomforts as the inevitable cost of such an effective and versatile material. We told ourselves that at least we were better off than the custom boat builders laminating off ladders and scaffolding. The odors, the resin on the floor and clothing and the usual dust from cutting and sanding fiberglass did not enhance the atmosphere of the boat shop itself.

In January of 2003, Derek attended the production of a 70 foot hull panel for a sailing catamaran. On arrival, the glass and foam were already on the table, dry, under vacuum and the vacuum seal had been tested. The catalyst was mixed with the resin. The resin supply tubes were dropped into the resin container and the taps turned on. Within minutes, the resin was seen running out to the ends of the panel and beginning to traverse across the panel via the grooves in the foam, spreading into the glass of the top skin. After 20 minutes the whole of the top skin was wet with resin. No dry, white glass showed through, and the resin had crossed to the other side of the panel to show that the underside skin was getting its supply of resin also. The process continued with a resin re-circulation system until the resin gelled just short of an hour from starting. The quality of the laminate was superb. The shop was neat and clean and an attractive place to visit and work.

Even at 70 foot in length, the resin infusion was in the control of one man. The hustle and bustle of hand laminating of panels is replaced with an unusual calm. Even the noise of the vacuum pump is in the background. It all happens under a sheet of plastic. The styrene is taken out of the building. There are no drips of resin and no rollers or brushes to clean and no acetone in site. The total contrast is remarkable.

Currently

Two main refinements have come about since 2003. Perforations are used to get the resin to the underside of the foam and a resin stop eliminates the need for resin recirculation.

So just what is Resin Infusion (RI) some readers may ask. It has actually been around for a long time, though not well known. Kelsall Catamarans has adapted this open technology to suit our Kelsall Swiftbuild Sandwich (KSS) build method. It is a simple process, requiring relatively little by way of equipment. Vacuum pressure moves the resin from its container, via tubes onto the table, from where it spreads out into the fibers and the surface of the foam. The best inventions are the simplest and this is one where we can only wonder why it took so long to come to our notice. It is without doubt, the perfect partner to KSS.

KSS

KSS is Kelsall Catamaran's building system, where every part of the cat, including the round bilge hulls starts as a flat panel on the mould table, from which it picks up a smooth gel coat finish. Having visited a dozen typical custom build cat projects, I have seen some superb craftsmanship, particularly in New Zealand, using the popular custom methods of today. I discussed their projects with the builders. What I saw confirms our claim that KSS will at least halve the typical build time for the structure. It ensures fair lines, which come from the method rather than from practiced skills. Much of the finishing process is eliminated. Much of the typical setting up is eliminated. It also saves material costs through minimum wastage and less investment in ancillary materials. RI makes it a much more pleasant undertaking but it also gives the best possible strength to weight ratio. More time is saved.

There are no restrictions on the style or size of cat that can be produced by KSS. KSS has been applied up to 93 ft. The method is not restricted to the professional. It is well within the capability of the typical owner builder. KSS and RI eliminates three tasks in custom boat building which are not pleasant ways to spend ones time. These are:

1. The first is laminating – let vacuum pressure do the work.
2. The second is the noisy, dusty trimming of glass laminates - now vastly reduced in that the foam only is trimmed due to the more accurate placing of the glass on the table.
3. The third is the dreaded long-boarding - picking up the finish from the table drastically reduces this task.

The best news ever for the custom boat builder.