

Upgrade for KSS – Half Hull Shaping

By Derek Kelsall, 2005

The principle of KSS hull shaping, starting from flat panels of foam sandwich, made on a mould table, is unchanged. The change is in the set-up and the shaping process itself. A number of advantages result from the change, the main ones being improved accessibility during the shaping and fixing process and less work needing to be done on the boat itself.

The resin infused sandwich panel is set onto a set of frames which define the topside shape of the hull, lying on its side. The area of panel to be shaped consists of one layer of glass on the outside and the foam only. Typically there are 8 frames, made of straight timbers which are set up on the shop floor and free to be moved to their required positions, which are marked on the panel itself. The timber across the top of each frame is removable and represents the center plane of the hull. Fixed to this timber is a pattern to the shape of the inside of the hull after shaping (not used on hull pictured below).

The outside dimensions of each frame are identical and quick to cut and assemble. The angled timber which sets the topside panel shape requires just one dimension. Setting the pattern position is the only other dimension needed. The pattern is the same shape for the main station frames. The panel is fixed to each frame through the deck edge radius area of the panel, so as not to affect the gel finish. A number of short dart cuts are made in to the area to be shaped, at right angles to the keel line. A timber batten, made in an "L" shape is set along the keel line and ratchet straps are attached to each frame. As these are progressively tightened the keel line is pulled up to the centerline, producing the round bilge.

The longitudinal "L" allows the fingers to move relative to each other and keeps the fingers and keel line fair. If needed a timber fairing batten is set, on the outside, fore and aft, through the middle of each finger to keep the dart cuts in line. Once the panel is set into place on the frames, the shaping takes place very quickly. When satisfied with the shape, the inside skin of the hull is completed over the shaped area. Laminating is by hand on an area which is readily accessible.

The frames are made in such a way that the half hull can be rotated through 90 degrees, to keel upwards, for the additional glass to be applied, to complete the hull scantlings, over the area of the dart cuts. Again, the process is readily accessible. Some finishing can be done at the same time. In the final hull assembly, narrow strips of fiberglass are added across the centerline join. Ideally, each half hull will remain in the frames for 2 days. The frames are rotated 180 degrees for the second half of the hull and re-used for the second hull.

A hull, of any size, is complete within a few days, with gel coat finish to the whole of the topside area, deck edge radius is in place and all the work has been done efficiently. All laminating has been done as and when it is easily reached. The topside area is automatically fair and the relatively small area below the topside is exceptionally well controlled for fairness and section shape. Half hull shaping is standard for all new KSS build, as is resin infusion for making the panels.

Not only is KSS hugely more efficient than any alternative custom build method, it is a great deal more pleasant to undertake, with no down side. Total cost of materials is down due to very low wastage and low use of auxiliary materials.

KSS and resin infusion is applicable to all custom build, whether by experienced professional or by the complete novice. KSS delivers an exceptionally simple, complete catamaran design/build package. Its evolution is continuous. Resin infusion is a technique that is quickly mastered on a few test panels and a few smaller panels needed for the boat. Do not let anyone tell you differently. RI is much too important to the boat builder and the outcome of any project of this nature, for all the reasons above, to allow anyone to deter you. Having done this work the hard and unpleasant way for all these years, to me, the amazing power of vacuum is "magic" and all so simple.

The other new idea for KSS cat building for 2005, is designing to suit some degree of modular assembly. Simplicity and efficiency of build is the driving force here as it is for most of what we do regarding technique and arrangement. Ask any craftsman how much quicker it is to do a job on the bench than on the boat and the answer will be a factor 2 or 4 or more. We are applying the bench efficiency to virtually all tasks. The typical deck saloon cat is built as three modules, which are virtually complete before assembly, with everything done from the shop floor.

KSS will get you sailing sooner. The time saved will be measured in years for most DIY projects. KSS designs currently on the board or being upgraded include the full standard range of sailing and power catamarans. Custom designs include 72,77 and 102 ft. New Ferry and power cats are also underway.

The pictures below were taken at a KSS workshop held in Loveland in Colorado, 2005. A 22 foot Amkat hull was almost ready to assemble at the end of four days of instruction and hands on experience for those attending. As usual, we had a diverse group but a group which quickly gelled. Laughter was a regular feature of the event. All left convinced of the simple common sense of what we do.

"Blown away" and "why would anyone use any other method".
*Pip Muir, Host of Loveland Workshop, Owner of Boat Repair
Business & experienced Kiwi Boat Builder*

Once again a KSS workshop provided us with the opportunity to trial our latest ideas. Workshops enable the development and progress of KSS keeping us ahead of any competing build system.

The very thought of trying to position glass accurately over a resin wet hull or worse inside a resin wet hull is now, thankfully, totally alien to our way of thinking and for all of our clients. Also remember that what we do applies equally to the remainder of the structure. For example, one major plus for working on the table and with RI is that, where applicable, foam and both skins are done in one shot, with major savings all round. We design to make good use of this feature.

Once again, we have added a couple of refinements to our RI technique. This suggestion came from Doug, one of those attending. Instead of putting the tackie tape onto the table, why not put the tape onto the bag first. In most instances this will save a lot of time and be more straightforward than on the table - which is how everyone and every demo I have seen has been done.



The Half Hull in the frames, after shaping



The Loveland KSS Workshop group

Note the white gel coat. The green paper is protecting the gel coat while applying the last layer of glass to the shaped area.

The Table

The table has been the subject of much debate. This table is of good quality, 20mm, melamine covered chipboard, with non-gloss finish. The joints to the sheets were set up by a kitchen producer to use the biscuit method. It took half an hour to join the sheets and fit butt strap underneath using whitewood glue. The joined sheets rest on a series of trestles. The gel coat is a sandable gel. The join lines are visible on the panels but will be lost with the sanding in preparation for painting, along with any print through. The gelcoat sands very easily. This inexpensive table is ideal for a one off project.