

KSS Advantages and the Strange Truth of Custom Boat Building

KSS (*Kelsall Swiftbuild Sandwich*) is a custom boat building technique which has been developed and refined over the more than four decades since Derek Kelsall pioneered the use of foam sandwich in boat building.

By Derek Kelsall, 2006

The KSS Advantages

- Working on a table for a large proportion of the work involved in making a full kit of foam sandwich parts.
- Resin infusion, which is the perfect partner to KSS, for 95% of the laminating for the whole project.
- A smooth gel-coat finish to one side of all parts of the kit.
- Each part tailor made, full size, for it's purpose on the boat, with edge treatment, provision for joining, openings capped etc.
- Half hull shaping with 11 simple frames and no set up of those frames.
- All work on hulls, including the large sizes, is done from the shop floor. Hulls complete in days, not months.
- By removing the smell, the handling of sticky resin, much of the dust, and by working with finished parts, the whole atmosphere of the workshop changes. The tasks are more pleasant, more satisfying and attract a different class of boat builder.
- Least weight, least cost, least wastage and fair lines guaranteed with no compromise of any kind.
- Mostly bonded assembly and most new designs are for modular assembly, to add the same efficiency to the fit-out - to save another huge chunk of time.

Halving of the overall build time is a very conservative estimate, KSS uses the materials that have proven to be the best over more than 40 years and to which all others have now switched.

It is clear that KSS has no rivals for either quality or efficiency of build. Over more than 40 years, as designer and boat builder, I have worked with the same materials, developing, refining and putting the ideas into practice. KSS is the only technique to receive such attention.

Why Not Adopted More Widely

With so many obvious advantages it is reasonable to ask; why has KSS not been widely adopted before now? For the answer we need to look at:

1. **The power of fashion and 'experts' in the field, against the lone voice**
People who say "do not touch KSS", claim expertise and give their reasons are uninformed. There are designers, materials suppliers, surveyors (particularly in US) and journalists in this group. They misunderstand KSS or have a vested interest reason in trying to turn you away from KSS. Some will make statements which are plainly in error, which must question their own credibility. Fashion is a very powerful factor. Following the fashion of the industry makes for an easy life for the designer. However a fashion can start for all kinds of reasons. Do not expect to find that something that is done by the majority is necessarily the best.
2. **How strip became accepted as the state of the art**
Strip construction became popular shortly after my first few years of using foam sandwich. Narrow strips of cedar are buried in epoxy. Strip foam came along a little later. Both have received wide publicity from the producers of the special materials to suit, and many fine craft have been built, giving further promotion. The designers followed to present a combined voice with just the one message. It is seen by the majority, as the state of the art. The fact that strip was devised to provide versatility of shape using the traditional approach, without any particular reference to the efficiency for the boat builder, is not made clear. That traditional approach leaves no room for real refinement and there is no way to avoid the time involved in handling narrow strips. The method is enormously labour intensive. The claims for actual build times by those selling is almost always optimistic (misleading) by a huge factor.
3. **The custom boat building industry as a whole**
The industry is made up of thousands of small independent companies. The total industry is huge. In NZ, where the majority of craft are custom build, it is claimed as the largest manufacturing industry. How efficiently the boats are built has to be the most important overall factor, yet, there is no R and D anywhere that would benefit the whole sector. There has never been one independent assessment comparing methods on any count. We could expect the boat builders to have that knowledge but that is just not what happens. The typical order will start with an owner choosing a design. The designer will have already determined the materials. The boat builder is keen to get the contract and when he does all the decisions have been made. There

are the boat builders who specialise in a particular material or method. Each one is claiming his specialty has advantages over all others. Confusion for anyone studying the subject and still no firm data. Decisions are made on fashion and sales talk.

Materials suppliers do of course develop the products but they are looking at just the one side of the problem. As we have proven over and over again, the only real progress has to start in the design office. However, the typical designer is not likely to have the necessary combination of; a bent for innovation, the intimate knowledge of the boat builders problems, the essential knowledge of the materials, and the opportunity to carry out literally dozens if not hundreds of trials on full size projects over a long period of time. I just happen to have got started in a particular way, both designing and building. I learnt about the materials and learnt the boat builder's problems the hard way. I then continued for no other reason than it was there to be done and I got considerable satisfaction in moving the process forward. The opportunities to try ideas came while boat building and designing the boats we built with client's projects and from the regular KSS workshops around the world.

The Start of the KSS Adventure

I began designing and building in foam. It was, and still is an adventure. We had immediate success in the ocean races. Our foam sandwich boats won around Britain (1966), solo trans Atlantic 1968 and around the World (the first Whitbread) amongst many others, with boats with one, two and three hulls of which at least four were the largest of type at the time. These high profile wins, but often low budget projects produced by relatively inexperienced boat builders, put sandwich on the map

All designers have made the switch to foam, though some did so only recently. Interestingly, the worlds largest sloop Mirabella, launched two years ago, is built to the precise materials specification as my first boat Toria - PVC Foam, Unidirectional Glass and Polyester Resin.

We had put foam on the map. However, we had not silenced the foam critics. I have a hundred stories of the ongoing effort in which we were involved to justify foam as a core material in sandwich construction, over the next 20 years at least. Of course, each step in KSS came in for criticism. With foam the word was "delamination", "KSS lacks shape control" or is "only for the hulls" are popular, but erroneous remarks. We have fought a battle on two fronts to get KSS to where it is today. That Kelsall materials and methods are singled out for this attention tells it's own story.

KSS When Seen

"You should be designing all the catamaran we build in NZ".

A professional boat builder. 2006

"Your technique is truly revolutionary. It has transformed our business, allowing us to quote for much larger projects, using the latest technology."

G.B. a young, talented boat builder in S. America. 2006

We hold workshops around the World to demonstrate KSS, in a hands on situation. Of the many hundreds who have attended, not one person has so much as questioned KSS or any claim we have made. Not one has ever suggested that strip or any alternative could be a valid option for any part.

A Relevant Comparison

After Toria in 1966, Sir Thomas Lipton followed a year later, to win the solo Atlantic in 1968. The building of STL provides an interesting comparison to a recent strip build. The skipper, Geoffrey Williams, a 15 year old school leaver and myself produced the elegant 58 x 12.5 x 6 ft (molded depth) hull, fully finished and ready to receive decks in less than 700 hours (ref, Sir Thomas Lipton wins). When a very experienced boat builder quoted for a 59ft. ferry to our design he told that he had produced a similar size cat of strip cedar and that each hull, up to the knuckle above the WL (59x5x5ft, of very simple shape) had taken his experienced crew 1000 hours. The most casual analysis of what is involved in both cases easily explains why strip is so labour intensive. Not only is strip a lot less efficient than KSS, it is a lot less efficient than the Kelsall foam methods of 1965. It is a step backwards in efficiency. KSS cat hulls of this size will take about 200 hours each. I have dozens of such comparison over all the years since Sir TL.

In every custom build project I have ever seen, build time is the most important factor. Extended build time will always mean more cost than planned for and often will undermine the very purpose of the project.

The strange truth is that such a situation could exist for the length of time that it has. Surely, a whole industry could not be deceived. Sadly for the boat builders, that is the truth. The major players in the industry, unless in a position to gain directly, will go to great lengths to steer others away from anything new or different. The losers are the boat builders and, in the long term, the whole industry.

KSS boat building method is the true state of the art.