

THE DIFFERENCE BETWEEN OUR BUILDING MATERIALS AND OTHERS

What is the difference between our building material and others?

Everybody understands the difference between fiberglass and plywood or between traditional wooden boat building and stitch and glue but what makes our material unique is not always well understood.

Let's look at three different materials and construction methods:

- Plywood on frame
- Stitch and glue
- Plywood cored composite

Plywood on frame is a boat building method that appeared before WWII: a boat made from plywood panels fastened and glued to a wooden frame. The frame is made of solid or laminated wood. That framing is the skeleton of the boat and supports most of the loads. It is made of a large number of parts that must be beveled and fit precisely together. Those parts are assembled with a combination of mechanical fasteners (screws or boat nails) and glue. The framing is then covered with plywood panels. Long panels are made from scarfed plywood. In some cases, the finished hulls are covered with fiberglass for resistance to abrasion and to seal all the small gaps.

The structure made from a large number of parts will not last as long as a one-piece composite hull. Plywood on frame requires good woodworking skills.

We do not design for plywood on frame.

Stitch and glue appeared in the 1950's. The consensus is that the first stitch and glue boat was the Dinghy Mirror. The boat was made from plywood panels assembled with fiberglass tape and polyester resin. Over the years, cheap but unreliable polyester was replaced with **epoxy resin**. Epoxy is all together a glue and a laminating resin. The epoxy bond is stronger than the plywood itself.

A stitch and glue hull should be a one-piece structure (monocoque) but many designers lack trust in the material or the knowledge to design a **fiberglass** structure. Often, the **fiberglass tape** is used only as a seam between panels but wood is still used for structural parts like keels, chines and bow stems. Those boats are hybrids between stitch and glue and ply on frame.

A few designers produce plans for stitch and glue boats engineered like fiberglass boats. The hulls are made of plywood panels welded together with fiberglass and resin. No solid wood is used. Just as in a production fiberglass boat, the framing is made of fiberglass beams. With decks and soles integral to the hull, this produces a true monocoque structure stronger than their fiberglass counterparts.

Not only is stitch and glue light, stiff and strong but it is builder friendly. No exact fit between parts is required, epoxy is gap filling. Gaps between parts are recommended in all text books about composites. This is the opposite of wooden boat building but works in favor of the amateur builder.

Stitch and glue is ideal for small boats less than 15'.

Some designers produce plans for stitch and glue boats up to 45'. They use thick hull panels laminated from several layers of plywood. We prefer to use more fiberglass as in our plywood cored composite boats.

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Plywood cored composite can be considered advanced stitch and glue. The building material may look similar to first generation stitch and glue but while the framing is identical, the hull skin is different. In plywood cored composites, **the panels are a true composite sandwich**. Just as in high tech boat building, the panels are made of a core between two skins of fiberglass. Those fiberglass skins can be quite thick. Our composite uses plywood as a core instead of foam or honey comb.

It has many advantages for the amateur or custom boat builder. The hull is assembled just like a stitch and glue hull. There is no need for a male jig: thanks to the stiffness of the plywood core, one can often use the frames and bulkheads as a jig. In some cases, the builder can use a basket mold. The thinner plywood panels are easy to bend, and the final product is truly a fiberglass boat without the risk of blisters associated with polyester. The materials are easy to find and familiar to the amateur, but the final product is an high tech boat usually lighter but much stronger than a production fiberglass boat of the same size.

Plywood cored composite is ideal for boats between 15 and 30'.

From plywood cored composite to **foam sandwich**, the transition is easy. The building sequence is similar and only the core material changes. Foam sandwich requires a different type of mold and much thicker fiberglass skins than plywood cored composite. Around 28' , at equal strength, a foam sandwich boat begins to be lighter, but it costs more in labor and material, approximately two times more.