

Fabricating a Fiberglass Hull

By Steve Wheeler

Introduction by Bob Filipowski

Although associate member Steve Wheeler can plank a hull with the best of them, there are times when he prefers the fiberglass format. In fact, if given a choice, this is the way he likes to build them. After telling me about his current work, a technique not common to our Tri-Club community, I asked him to send me some photos and a brief description of how he does it. This is unique stuff, mates!

The first step in my process is to carve a basswood pattern of the hull, which I call a "positive". This particular model will be 22 inches long, 8 inches wide with a 2 inch draft, and represents a hunting boat.

Using the bread & butter method, the positive is configured so that it can be separated along the centerline after the carving is completed. Note the absence of the keel in Figure 2.

The plaster mold is made by building a box around the basswood pattern, (See Figure 4) then pouring plaster into the box...thus making half a "negative" of the hull.

The reason I made the mold in two parts revolved around the sheer strake, which on this boat would probably have been varnished, with the rest of the

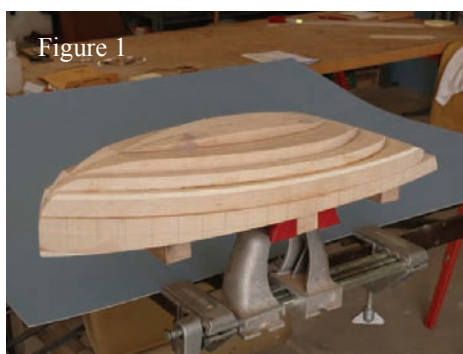
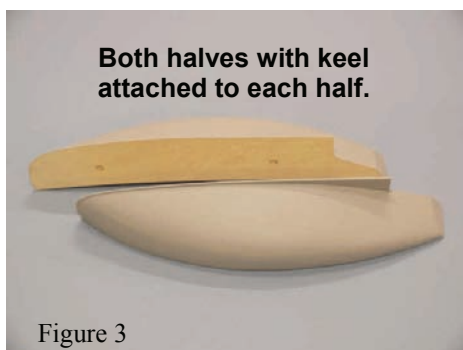


Figure 1



Figure 2



Both halves with keel attached to each half.

Figure 3

hull painted. I needed to mold rabbets in the hull at the sheerline to take wood inserts that would represent those planks. To do that I glued wood pieces the shape of the sheerstrakes into the plaster mold halves (Figure 7). Since these would have made undercuts in the mold, I had to make it in two halves so I could pry it apart and remove the fiberglass molding after it cured.



Figure 4



Figure 5

The plaster molds took a few days to cure. Most of the free water had to evaporate from the material before I could start putting sealer (shellac) on it as the base for the release agents--which were PVA

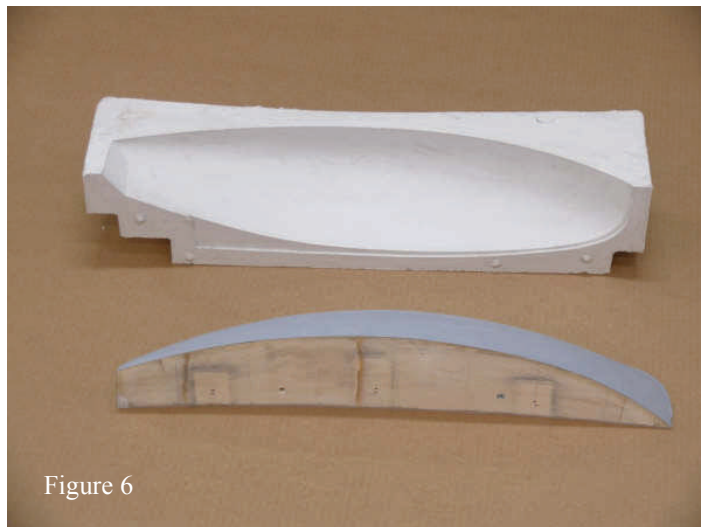


Figure 6

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(poly vinyl alcohol, from Hobby Lobby and paste wax). Turns out I used 25 pounds of plaster and 2 gallons of water to make both halves of the mold.

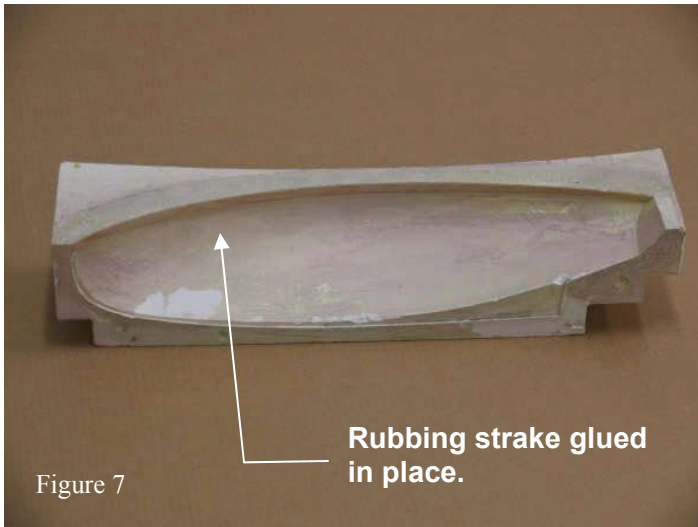


Figure 7

Rubbing stake glued in place.



Figure 8

The two halves joined. The rubbing strakes have not been added in this photo.

Once the two halves are joined, three layers of fiberglass cloth and epoxy resin are then laid into the plaster mold and allowed to cure (Figure 9). When the glass lay-up is removed from the mold, another "positive" results, duplicating the shape of the basswood pattern, but in the form of a hollow shell--which is the actual hull of the model.

Everything worked as planned except that the mold release didn't work as well as it had in the past--the hull stuck in the mold & I tore some plaster out as I

removed it (not a problem as this is a one-off model). Not sure why this happened, but I used a different kind of wax (Turtle Wax) rather than the

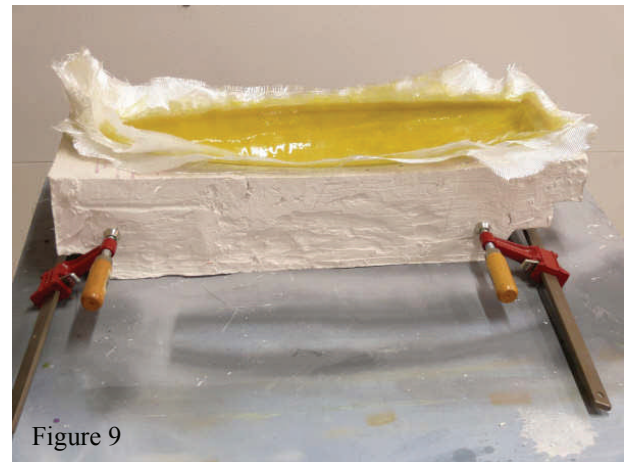


Figure 9

hard carnauba wax I used in the past, and couldn't find in my shop. The Turtle wax seemed to dissolve the PVA mold release as I applied it, and this was probably the source of the trouble. So, I lost a plaster mold--which only cost about \$15 for the plaster--but got a nice fiberglass hull.



Figure 10

The cost for the hull was a few bucks for the glass cloth. I used West System Epoxy and when I bought it, it cost \$105 per gallon. On the other hand I've gotten six hulls, including this one, and painted-on epoxy coatings on two other models out of that gallon (which works out to less than \$20 each), and I have enough left for another small model. The pattern half hulls were basswood, and I spent about \$21 for the wood. The mold box was scrap wood and cost nothing.

Why fiberglass? Three reasons: (1) even with all the work, I can usually build a glass hull quicker than a wood planked one. (2) I really don't like planking. (3) Glass is much more stable and it won't swell/shrink when a model changes climates (remember the RH here in Colorado can range down to 3% at times). Also the material a hull is made of doesn't matter when the hull is painted and you can't see the base material.