

Building a Carbon Fiber Greenland Paddle

By Greg Welker

My favorite paddles are greenland paddles. I have been making wooden greenland paddles for many years now, usually out of solid pieces of cedar or laminations of different woods selected for weight, strength and durability. Last summer, Alan Avery, a paddler at the Pier 7 pirate gatherings of CPA, had begun making greenland style paddles out of marine grade foam core, carbon fiber, fiberglass and epoxy. The light weight of those paddles interested me in the possibility of making my own high tech greenland paddle.

My raw materials were as follows:

- 3/4 inch thick corelite foam, sold in 4'x8' sheets at local marine boat building companies in Annapolis.
- 5.8 oz./yd.² Warp 8, 12K Carbon X Fill 8, ECG-150 1/0, Unidirectional, .010 in. Thickness tape in a 1 inch width. available on the internet.
- Fiberglass 3.7 oz./yd.² X 27", S-2 cloth available on the internet
- MAS brand epoxy available at Chesapeake Light Craft, and some marine retailers.
- Black epoxy/fiberglass color tint. Available anywhere fiberglass supplies are sold

I also used these tools:

- Hand jig saw
- 6 inch block plane
- medium wood file
- sand paper of various

grades

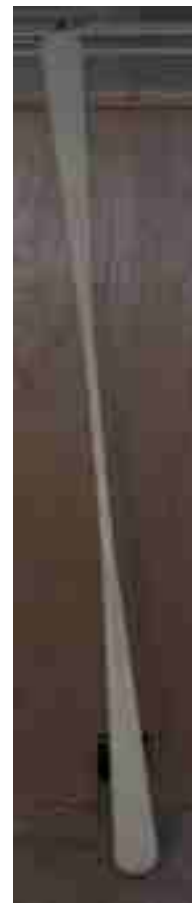
- plastic wrap

I began by tracing the outline of the desired paddle on the foam sheet. Use any of the many greenland paddle designs available on the web for the dimensions. I cut out the shape, then cut two strips of foam the same width as the loom area and about half the paddle length. Since I was using 3/4 inch foam I laminated one of these strips to each side of the paddle, front and back, to build up the loom thickness. I glued them in place with the MAS and let them cure overnight with weights on the paddle to hold the pieces together.

When the epoxy had fully cured I used the block plane, wood files, and sand paper to shape the paddle to the finished dimensions just as if it was a piece of solid wood. The foam works easily, but dulls the plane blade faster than working on wood. Be careful to fully support the ends of the paddle as you work on it to avoid snapping the foam in two (see the photo showing the finished foam shape).

When the paddle is fully shaped, I cut two pieces of carbon tape, each as long as the paddle plus about two inches. I laid the paddle on a flat surface, put supporting wedges under the ends of the paddle to keep it true, and epoxied one strip of tape in

place on one side and let that cure. I repeated the process for the other side. I tested the flexibility of the paddle and decided that it was too flexible with just one strip on each side, so I added a second strip on top of the previous strip on each side after sanding the previously applied strips (see the photo showing the black carbon tape in place before sanding). I then sanded the second strips smooth to match into the foam shape. Be careful sanding the carbon, as its small pieces act like very tiny splinters - use work gloves.



Paddle from foam



Paddle with carbon tape

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Now came the tough part. My fiberglassing skills can best be called crude. I placed a piece of plastic wrap about two feet longer than the paddle on the floor and taped it in place. I then cut a piece of glass cloth the width of the paddle shape plus one inch, and about two inches longer than the paddle. I cut this on the bias. I learned that S glass particles are much more itchy than the glass I normally use to repair boats. Wear a mask and long sleeves!

I mixed up a batch of epoxy and added the black color tint. Then I applied a coat of epoxy to one side of the paddle and placed the glass on the paddle, folding it around the paddle blade edges and adding epoxy to wet down the glass. I tried to keep the epoxy to a minimum. I had hoped to get the glass to fold over the edges but had difficulty doing so. When the epoxy set, I trimmed the edges of the cloth, roughly sanded the glass, and repeated the process of placing glass on the other side of the paddle in the same manner. This was easier to fold over the glass along the paddle blade edges. The black tint of the epoxy was useful in

making sure I fully coated all of the paddle with epoxy, as any missed areas stood out with the white foam color.

Various grades of medium and fine sandpaper were used to smooth the glasswork. Then I took a batch of tinted epoxy and rubbed it over the entire paddle with a piece of sponge, applying it as lightly as possible to make a uniform coating (see the photo of the finished paddle).

My typical laminated wood greenland paddles made to the same size and shape weigh 1,102 grams, or 38.9 oz. The same paddle shape and size in foam and carbon weighs 725 grams, or 25.6 oz. That makes the carbon paddle weigh in at 34% lighter than the equivalent paddle in laminated wood. And I think they are equally strong, though that will remain to be seen. The foam carbon paddle cost about \$40 in materials (although the foam is available only in 4x8 sheets, you can get six to eight paddles out of a sheet) and about a week's worth of 2 hours per evening. Compare this to the carbon

greenland paddle available commercially at \$350+. This proved to be a very doable project for someone with minimal wood working and epoxy skills. Please feel free to contact me at gwelker@chesapeake.net or 301-249-4895 if you have any questions while you try this at home!



*Finished
paddle*

Volunteers Needed

Friday to Saturday, May 6 & 7: **Springriver's Tenth Annual Maryland Sea Kayaking Festival** at Sandy Point State Park. Friday, Noon until 5 pm; Saturday, 9:30 am until 4 pm. Several safety support kayakers are needed each day. Contact Alan Avery, 410-956-3299.

Friday to Sunday, May 14 & 15: **CLC's 6th Annual Okoume Fest**. At least 3 support kayakers are needed for Saturday from 8 am until 5 pm and Sunday from 8:30 am until 12 noon. Lunch will be provided for the Safety Crew, as well as a \$25 store credit, CLC hat and t-shirt. Contact Ed Wigglesworth, CLC, 410-267-0137, ext. 11.