

Building a Better Spade Rudder

Competition Composites Inc.

While spade rudders may not be the sexiest things to come out of our shop (CCI, formerly known as *Phil's Foils*), our reputation for building a great product seems to be spreading. And we've developed techniques that allow us to build our custom one-offs at a price point that is competitive with OEM moulded blades.

In these economically challenging times, many of us are faced with getting more out of what we have got already. Our sailboats are no different.

A new CCI rudder can transform your boat for price appropriate dollars.

Loose pounds, get better feel, reduce maintenance, improve lift, reduce drag and re-learn the joy of driving your boat.

Old rudders often have large voids in the foam, heavy weight skins soaked in polyester resin (and frequently dry fibers too), and water saturated foam.



Sirius 28 rudder after splitting apart.

Let's follow a step-by-step review of how we build a better rudder.

First, the core.

CNC machine out of a sheet of either CoreCell or Divinycell. These are high performance closed cell foams that have a shear strength comparable to cedar. We machine our cores in port and starboard halves, with the inside milled to accept the post and internal web. The halves are bonded under vacuum pressure.



This Aerodyne 38 core was machined with a strip of high density foam along the leading edge.

If you're on a carbon budget, we can do tricks such as building a carbon post that is tapered to match the skins. This allows initial wraps of laminate to go around the post and tie it to the outside skins, eliminating any need for an internal web.



On this C&C110 rudder, the post is being fitted to the core. Uni carbon will wrap around the core and post prior to bonding on the leading edge of the core (sitting to the right in this photo).

On to the skins:

Laminate skins of unidirectional and biaxial fiberglass (or carbon fiber) that wrap continuously from trailing edge, around leading edge, and back to bond to itself at the

trailing edge. There is no parting line for water to get in. All resins are epoxy, and the skins are vacuum bagged in one operation when lamination is complete.



C&C37R rudder in the vacuum bag. Battens are clamped along trailing edge to eliminate distortion.

Following lamination, we fair and prep for paint. The fairing compound is epoxy based, and we lay on just enough to ensure that we fill the weave of the cloth (without distorting the shape of the rudder that was established back when the core was milled). We are all sailors here, so we get it – the shape you are after.



Our C&C37R again. The fairing compound goes on... and most comes off again!

The final step is to seal the rudder with a few coats of epoxy primer.

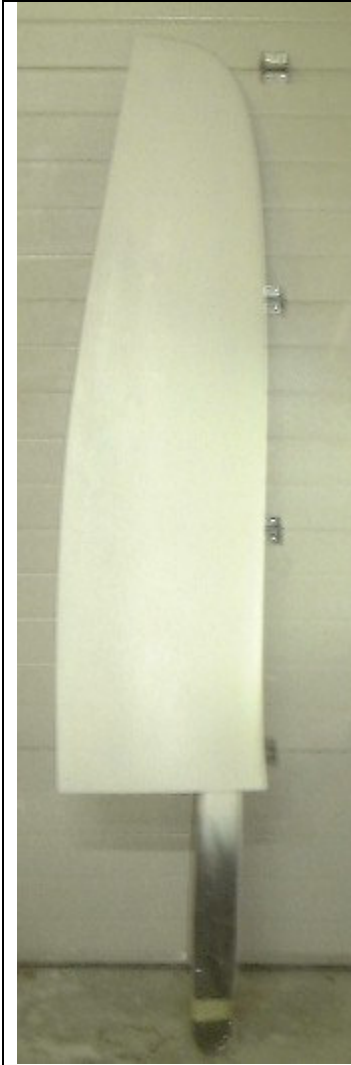


C&C37R being sprayed with primer.

Q : How long does all this take?

A : Ask the guys on Hot Ticket, who lost their rudder on the way to Key West '08. In their case, 6 days after we got the phone call their replacement rudder was in the crate and heading out. But normally we budget 2 weeks of elapsed time to build you a new blade from scratch.

Oh, did you say spade rudders weren't sexy? Just take a look at a few of these fine shapes fresh from our workshop :



*Aerodyne 38
Roger Martin design*



*International 6m
Ian Howlet design*



*J90
CCI design*

You can see more of our work at www.fastcomposites.ca , email Dave at dave@fastcomposites.ca or give us a call at (613) 599-6951 to discuss your needs. Now is the time to get that new rudder in our production schedule for spring (or fall series for southern hemisphere folks!)