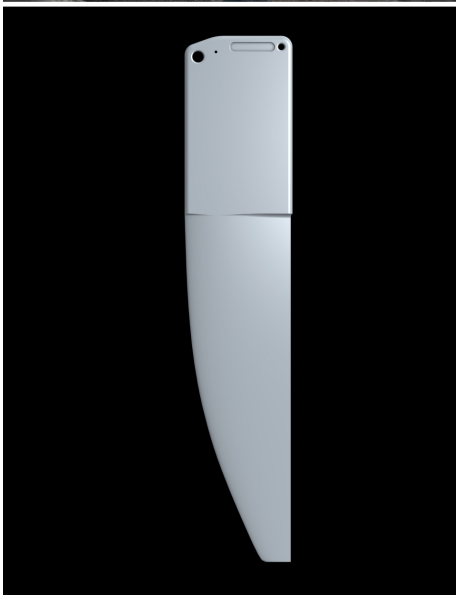




The Latest News from AeroSouth - September 2021



The Science of Sailing #1 - Daggerboards

Whether its called a daggerboard, centerboard, or leeboard, as sailors know, the daggerboard takes the place of a keel to prevent a boat's lateral motion caused by wind forces on the sails. Since water is about 800 times more dense than air, the "board" will be much smaller than the sail. The rudder blade too contributes an opposing force to the sail, and is influenced by the flow around the daggerboard just upstream. Add to this the effects of the water's "free surface", heeling angle of the hull, incipient waves, and the motion of the hull and one sees that the physics of daggerboard design is very complex, indeed!

In the case of a small sailing dinghy like the Sunfish, the side force created by the daggerboard when sailing at 10 knots is about 700N or 158 pounds - as much as the sailor himself! The board must therefore be strong enough to withstand these hydrodynamic forces, which increase with the square of the speed through the water. (One of the greatest loads on a daggerboard however is the weight of a sailor on it when righting a capsized boat; here the weight of 100kg = 220 pounds is typically used by designers.)

A modern daggerboard is more akin to an aircraft's wing than a simple, flat, rectangular slab of wood, aka "board". The overall shape when viewed from its side, also known as the "planform", as well as the cross-sections down the board (its hydrofoils, similar to airfoils in a wing) must be

chosen carefully to yield sufficient side force at a minimum of drag. The ratio of lift to drag (or side force to resistance in nautical terminology) is a key parameter that engineers use to compare designs, the higher the value, the better.

The most efficient wings are found on modern sailplanes, such as those shown here from the company [Diana Sailplanes](#) of Poland. Note the resemblance of their sabre-shaped wings to that chosen for the [AeroSouth Sabre Daggerboard](#). This was not by accident, but resulted from hundreds of iterations using sophisticated flow simulation and stress analysis tools, combined with decades of experience in using them. The result is perhaps the world's most efficient daggerboard for Sunfish-class sailboats.

Read more about the technology behind AeroSouth's FS rudder blades and Sabre daggerboards [here](#). Both are in stock and ship within 24 hours for \$300 each. Order yours today from the [AeroSouth store](#)



Why Sapele Wood?

In this age of plastic boats and components, AeroSouth's use of wood for its Sabre daggerboards and FS rudder blades might seem at first archaic. As the saying goes though, "Don't judge a book by its cover."

Aren't composites superior in all aspects? Some years ago, the answer to this might have been yes, at least when it comes to rudder blades and daggerboards. Many things have changed though since [Hobart "Hobie" Alter and Gordon "Grubby" Clark](#) pioneered the use of fiberglass for surfboards in the late 1950s, and later for the splendid Hobie Cat sailboats.

Wood is actually God's composite, combining tough, interlocked cellulous fibers with an epoxy-like substance we call tree sap. Pound for pound, wood has twice the tensile strength of aluminum. When modern CNC (computer numerical control) machinery is available, designs as complex as those now made from metal or composites can be shaped with minimal human labor. Changes to designs can be quickly incorporated without the need for new molds as is the case for composites. Advanced epoxy coatings protect wood surfaces from rot, insects, UV exposure and impact.

Repairs and refinishing can be accomplished with common tools and coatings most people have in their home workshops. Wood also does not need the hazmats common with composites, lowering costs. And it is light - the [AeroSouth Sabre daggerboards](#) for the Sunfish seen here are 15% lighter than Class legal composite boards. [AeroSouth's FS rudder blades](#) are 33% lighter

than Class legal composite blades. Some of the most advanced light aircraft make use of propellers made of wood, despite the widespread use of composites for their airframes. Wood even smells good, is aesthetic in its own right, and is satisfying to work with.



At AeroSouth, we chose **Sapele** (pronounced sa-PEE-lee), a variety of African mahogany named after the Nigerian city of the same name where it is commonly found. Like mahogany, sapele is strong, rot- and insect resistant and easy to machine with modern CNC milling equipment. Unlike mahogany, it is abundantly available at an affordable cost, the reason it has become popular in the marine and furniture industries in recent years. Fortunately, AeroSouth is based in North Carolina, the state with the largest furniture industry in the USA. Our partnership with a local furniture maker gives us access to abundant supplies of sapele as well as our partner's advanced, German-made CNC equipment.

So there you have it - wood, God's composite, worked well for **Noah's Ark** and for the **Pilgrims' Mayflower**, and it is a great material from which we make the world's most advanced daggerboards and rudder blades.



Dinghy Bob adopted by FWSA Fleet

A major sailing club in Florida affiliated with the prestigious **FWSA** ([Florida Women's Sailing Association](#)) recently placed a large order for Dinghy Bobs, AeroSouth's latest innovation to help people **sail faster and have more fun** on the water.

Members of this club are fully capable of righting a capsized sailboat that has turned turtle - provided the rig does not get stuck in the muck in the shallow bay

where they often sail. Concern over this limits the number of days when they will sail - *not fast, and not fun*. Look for photos of the club's fleet of boats equipped with Dinghy Bobs in an upcoming newsletter issue.

Don't think turning turtle can be serious? A competitor in the 2021 Harker's Island Regatta recently related to us his experience in a past race: "The gusts were strong and the water was choppy as I was rounding the mark. Just as I was passing it, a gust caused me to capsize, my rig submerged and wrapped itself around the buoy's mooring cable. I was out there alone in the water for quite awhile before the race boat realized what had happened and picked me up. We had to go out later and retrieve the boat, it was tangled so securely in the cable." With a Dinghy Bob on the top of the spar, this would not have happened.

In stock and ships within 24 hours for only \$99 (plus shipping and taxes.) Order yours today from the [AeroSouth store](#).

Monomomac Lake Sailing Association raffles AeroSouth Mainsheet Hanger Clips

Chris DiPre, Vice Commodore of the Monomomac Lake Sailing Association near Rindge, NH, recently reported on the club's annual Labor Day Regatta:



Happy Labor Day Weekend! Hope it is drier where you are - we sailed in rain today!

I wanted to get back to you with a final thank you for the mainsheet clips and pictures of the two winners in our raffle. The first to win was our Commodore, Dale, and the second to win was one of our newest members, Jamie.

There was a nice buzz about them and it was a fun addition to our closing meeting. Now I am waiting for some feedback!!

All because of your generosity! I hope it comes back to you threefold!

Good luck with your business adventures. I look forward to more innovative products from AeroSouth!

cheers

Chris

Vice Commodore (till this time next year, when I move into the big seat!)

Our pleasure Chris - Sail Faster, Have More Fun!



AeroSouth at 2021 Women's Nationals

On September 25th we will be attending the final day of the **2021 Sunfish Women's North American Championship**, hosted by the Columbia Sailing Club on beautiful Lake Murray near Columbia, SC. The long list of registrants is a veritable "who's who" among the Leading Ladies of competitive sailing.

AeroSouth has contributed to the event by providing one of our popular and effective mainsheet hanger clips, approved for Class Legal racing,

to all of the participants. **Hoping to meet you there!**

SAIL FASTER - HAVE MORE FUN
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