

HYDROFOIL

BUYING GUIDE



A hydrofoil is a board with a wing attached to it by a mast. You stand on the board with the wing submerged in the water and when you start moving, getting water traveling fast enough across the wing, it generates enough lift to float the board free of the water so you start flying!

Aspect ratio on a hydrofoil determines how the foil performs in the water. While it sounds complex it is actually quite simple.

A foil's aspect ratio relates to the length of the foil from the leading edge to trailing edge (chord) vs the length of the foil tip to tip (width). A high aspect foil will be small from leading edge to trailing edge (short chord) and longer tip to tip (very wide) - think of it as a samurai sword, long and skinny. A low aspect foil will be longer from leading edge to trailing edge (long chord) and not as wide tip to tip (less wide) - think of it as a broad sword, shorter and fat. The chord vs (divided by) width gives you your aspect ratio. Low(er) aspect foils tend to be more fun for progressing, learning on, and are most suitable for 99% kites. You will know when a race foil is right for you and riding a lower aspect foil will help you get to that point faster.

HIGH ASPECT FOILS

High aspect foils don't produce as much lift, therefore they are unstable at low speeds. As you begin traveling faster and faster, they become more and more stable and slice through the water extremely efficiently. Think of it as a samurai sword slicing through butter.

Pros:

- Extremely stable at high speeds
- Extremely efficient through water, making them faster
- Allow you to point higher and quickly go upwind

Cons:

- Unstable at low speeds
- Less forgiving while learning to foil
- Make learning transitions and other intermediate + advanced foil skills (transitions, toe-side riding, turns, etc.) more difficult
- Become obsolete quickly if you intend to race
- Not as versatile for cross-over functions

Practical Uses:

- Racing
- High speed touring/Distance riding
- Jumping
- Kiting in moderate to high winds

LOW ASPECT FOILS

Low aspect foils generate a lot of lift and stability at low speeds, but become unstable and generate drag as you go faster. Think of it like a broad sword, thick and fat, powering through a piece of wood.

Pros:

- Extremely stable at lower speeds
- Generate lots of lift and power as you ride
- Allow you to foil sooner at lower speeds
- Allow you to pump the foil to generate power
- Allow you to kite in lower, moderate, and high wind speeds
- Make it easier to learn to foil, as well intermediate + advanced foil skills (transitions, toe-side riding, turns, sitting on the foil, etc.)
- More versatile for foil surfing in waves and behind a boat

Cons:

- Unstable at high speeds
- Generate drag at high speeds
- Not as good for touring at speed or racing

Practical Uses:

- Learning to foil + Improving foil skills
- Cruising + Joyriding
- Foil Surfing in Waves/Foil Surfing behind a boat

WHAT IS CAMBER IN A FOIL?

Foil camber is the thickness of a foil wing and determines how much lift it generates. A *high camber* wing is going to be extremely thick and generate lots of lift (Think 747 Wing) - best suited for low-speed surfing. A *low camber* wing is going to be thinner and generate less lift, but can cut through the water more efficiently at high speeds (Think F-16 Wing) - best suited for racing. The tradeoff - high camber wings do not perform well at high speeds, low camber wings do not perform well at low speeds. *Low Aspect Wings = High Camber; High Aspect Wings = Low Camber.*

WHAT HYDROFOIL MAST HEIGHT SHOULD I BUY?

A foil's mast height directly affects your ride height and your clearance above the water. A taller mast will let you ride higher above the chop, giving you a more forgiving sweet spot as you cruise where the wing can't come out of the water. But, taller masts can also lead to harder wipeouts when you fall and make the foil more prone to grounding out in shallow waters.

WHAT ARE HYDROFOILS MADE OUT OF? WHICH TYPE IS RIGHT FOR ME?

Hydrofoils are built from a variety of materials and generally cost correlates to performance, strength, and longevity.

WOOD/FIBERGLASS There are DIY foil kits that look like a blast to build and use, maybe with your kids or a few buddies over a beer. That being said, foils are fast because they are stiff and do not flex. Wood/Fiberglass tends to flex easily and not be as strong upon impact. You are also forced to make the foil parts bigger to make them strong enough so they are clunky and slow. Given that it will cost you a few hundred dollars to build and you can purchase a much better foil at similar cost, we don't often recommend a wood foil. Look at any modern performance boat, they are not built with wood.

FOAM CORE As you get into bigger and bigger (particularly surf) wings, companies use foam core laminated in carbon or fiberglass. Some experimented with building masts laminated in carbon. Foam core wings work beautifully and are generally low aspect, thick, surf wings. This "pure surf" type of wing doesn't behave as well at high speeds, making them less suitable for large waves and normal speeds during kiting. Try to void foam core masts, they are not stiff enough to support massive loads and tend to snap.

ALUMINUM As a stiff, strong metal that is cheaper than carbon, many hydrofoil components are built from aluminum. Particularly mast and fuselage components. Aluminum foils are great for entry level and advanced foil setups. Particularly modular setups. While they are heavier, prone to corrosion, and can warp. Many great foil setups come in aluminum.

CARBON Hands down the best material to make a hydrofoil or any performance component out of (or at least to us). Carbon hydrofoils are the best, but are more expensive. The cost is generally worth it if you plan on using it for a good amount of time.

STAINLESS STEEL The screws holding foils together tend to be made out of stainless steel. Or at least should be to avoid corrosion.

The best hydrofoils are going to be made of a blend of carbon/aluminum, carbon/foam/aluminum, or all carbon components with stainless steel fittings to tie it all together. Purchasing a foil depends on your budget and goals, and we recommend buying a setup that is modular (allows you to swap parts) and allows you to progress from rote beginner to advanced foiler.

WOOD

Pros:

- Cheap
- Fun to build

Cons:

- Clunky & slow
- Lack stability
- Prone to breakage and warping

Practical Uses:

- Fun garage project to try something new
- Cheaper entry to foiling and testing whether you want to buy an actual foil

FOAM CORE

Pros:

- Cheaper to build (thus less expensive than pure carbon)
- Fairly stiff/strong
- Cheap and easy to repair
- Provide lots of lift and float

Cons:

- Not as stiff as a carbon wing
- Tend to float, making it difficult to get the wing underwater when first getting the board onto your feet

Practical Uses:

- As a core for surf & low aspect wings

ALLUMINUM

Pros:

- Easy to mass produce via extrusion and milling
- Cheap and easily modular
- Relatively stiff & strong
- Virtually shatterproof and impact resistant

Cons:

- Heavy
- Prone to corrosion, warping, bending, and screw stripping
- Difficult to repair

Practical Uses:

- Foil masts, fuselages, and mounting plates
- Surf/moderate performance cruising setups

CARBON

Pros:

- Extremely light and stiff
- Impact resistant
- High performance
- Decently easy to repair
- Immune to corrosion

Cons:

- Expensive
- Prone to shattering/cracking if you ground out or drop it

Practical Uses:

- Suitable for building all aspects of a hydrofoil
- Cruising/high performance race/surf setups