

Light is beautiful

The EcoCats and Spirited catamarans are very light: in average, lightship weight is half the weight of most charter catamarans, without compromise on the structure or the payload. This is achieved by using light balsa (structure) and honeycomb (furniture) cores co-cured at high temperature with **Epoxy** reinforced fibre, whereas most of our competitors use poor performance Vinylester or Polyester resins, female moulding with heavy gel-coats, heavy linings, and plywood throughout for internal furniture. But what are the benefits of a light catamaran?



Furniture in DuFLEX Honeycomb

Performance

Indeed, performance is what comes first in mind. If your programme is crossing the Atlantic and sailing the Caribbean with an ideally orientated trade wind to power you up, then a light yacht might not be of interest for you. But if you intend to sail the Mediterranean or East Atlantic, where winds speeds and directions are less than predictable, then the Spirited are made for you. It is part of Murphy's law that most of the time, the wind will seem to come from where you want to go!

One of the main seaworthiness considerations for a catamaran, is her ability to sail against the wind. Various studies, including the ones from well known British designer John Shuttleworth, have shown that in average:

- A 25% decrease in keel efficiency (daggerboard -> shallow keel) will result in a loss of tacking angle of 5°;
- Doubling the hull weight will result in a loss of tacking angle of 6°;
- A 35% increase in aerodynamic parasitic drag (vertical roof, heavy rig profile) will result in a loss of tacking angle of 6°;
- 16% decrease in sail area will result in a loss of tacking angle of 4°.

Therefore overall, this is **21 degrees of tacking ability that will be lost** between a heavy catamaran and a performance designed one. This means that, for a 50 knots journey against the wind, a performance catamaran tacking at 40° at 7 knots will take 9 hours, whereas a heavy charter catamaran tacking at 60° at 5.5 knots will take exactly twice the time, also doubling its exposure time to bad weather...

Easy handling

A light catamaran needs small sails. Seas are filled with yachts motorsailing with the genoa only, due to the difficulty and energy needed to hoist, reef or downhaul the mainsail, aside from poor performance. A mainsail area of 50 m² is about the maximum size for which a single handed man or a couple can hoist and reef a mainsail in comfort in most weather situations. At 15 knots wind speed, the wind load on a 50 m² mainsail can be as much as 2000 N (equivalent to a weight of 200 kg).

Additionally, the trend tends to drive the mainsail halyards and reefing lines to the cockpit, increasing the numbers of blocks on the way, and the friction load on the halyard or the reefing lines. Nowadays it is not uncommon to see electric winches on units as small as 40 foot... But on catamarans, flat large decks and the absence of heeling makes the foredeck the ideal spot to handle the mainsail with ease, without transforming your cockpit in a plate of spaghettis. And the windlass can easily replace an electric winch for hoisting the sail...

To compare the relative performance of two yachts, designers use the non-dimensional Bruce number, proportional to the square root of sail area on the cubic root of displacement. What this basically means is that a catamaran with twice the displacement will be in average 20% slower with the same sail area, or will need a mainsail 60% bigger to achieve the same average speed -which means 60% more energy and efforts...

So the first and foremost advantage of a light catamaran, is to have a yacht easy to sail short-handed, where you will not hesitate to hoist the mainsail and shut down the engines at the slightest breeze!

Fuel consumption

As opposed to the Caribbean during the trade wind season, on our side of the Atlantic it is not uncommon to have long periods without wind, and be obliged to motor for hours to rally our favourite cruising spot.

The required engine horsepower is proportional to the cube of the speed, but is directly proportional to the displacement. Therefore at the same speed, a catamaran with half the displacement will have half the diesel consumption, and will need to have smaller engines and embark half the fuel for the same autonomy, further increasing the lightness of the ship.

A light catamaran is environmentally friendly !

Comfort

Many multihulls are prone to hobbyhorsing and pitching. This is why there is a tendency to consider that a catamaran is comfortable and seaworthy from 45 feet and above. The hobbyhorsing results from the shape of the hull, designed to accommodate queen-sized beds and concentrated loads (engines, batteries, fuel tanks, plumbing) aft of the hulls, and the distance and moment between the centre of gravity and centre of buoyancy. A light 38-foot catamaran with carefully divided weight, will have minimal hobbyhorsing.

Resistance to fatigue

During its lifespan, a multihull is subjected to millions of cycles of various complex loads. If the boat is to survive in all conditions without damage, careful attention has to be paid to the long term fatigue of the materials used to build it (see "[Benefits of Epoxy](#)"), and to avoiding stress concentration in the structure. The weight saving increases the strength of a boat, because it not only reduces the loads the boat experiences, but it reduces stress concentration, which is a major cause of fatigue failure.

A light composite catamaran will increase its lifespan, and keep its residual financial value at its best!