

Weight & Distribution

Information Document



Weight is a prime consideration in catamarans and will impact on the cost of the main shell structure initially, buying lightweight is more expensive, then you need strict discipline throughout fit-out and the finishing stages to achieve a sensible balanced result.

Multihulls are not the only vehicles that have this issue, aircraft, surfboards, cars and motorcycles - every product out there including your laptop are all working hard to achieve smaller and lighter - why? Simply to use less energy to move or use them, they are lighter to carry therefore less energy to move, resulting in lower loads to move initially and then again to stop.

The weight in a composite catamaran is very similar with loads generated by movement - not only forwards and backwards but pitching up, down and sideways and usually all together. These moments are resisted by the buoyancy in the hulls responding to the external water pressure.

It is easy enough to visualise the forces and moments at play on a vessel at sea. It is obvious to see that heavy hull ends and side edges will be far harder to slow down when sinking into the water, as well as slower to stop when moving upwards - this momentum has considerable force. It is easy to see why a heavy shell built with cheaper materials has a disadvantage over a light shell simply because the extremities in the light shell can respond so much quicker than the heavy shell.

Of course the shell is only the start, now for all the cruising and sailing toys, plus of course the basic equipment we must have, motors, mast, sails, water and fuel etc which must be placed as centrally as possible. Keeping heavy items in the Centre of Rotation with the LCG (Longitudinal Centre of Gravity) centred over the LCB (Longitudinal Centre of Buoyancy) when complete this means the vessel will trim perfectly.

It is crucial to consider the heavier items and their positioning. Motors such as two diesels can be either shaft drives with weight further forward or sail drives set further aft, we always prefer shaft drives, however clients are often persuaded into sail drives by their boatbuilders being faster and easier to install. Masts naturally have their CG (Centre of Gravity) set higher off the deck this leverage has a big effect on pitching moments so saving any weight up top is definitely worthwhile. An obvious choice is a carbon mast and lighter sails, they are good options but can be expensive.

We often hear salesmen selling heavier catamarans, saying a heavy boat is more comfortable at sea - well if in calm conditions with small chop, perhaps this is almost true. Add a little wind and waves and you are now finding your bows submerged or in the air shaking all the wind out of the sails and confidence out of the crew. The lighter catamaran is sliding along effortlessly responding quickly and staying far more level. Being much more easily driven she also has a far smaller



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By Jeff Schionning



mast, therefore lower mast CG, reducing the pitching moments.

Being easily driven you have very lightly loaded shrouds, this gives a far more relaxed feel to the boat and this means a more relaxed crew. A light stiff shell results in a multihull that can achieve fast relaxed passages, draw less when anchoring and less loads when beaching. Outrun severe or unpleasant weather patterns with increased speed and performance, shorter passage times, the list of benefits goes on.

Weight is a key factor in multihull design and construction, and I hope I have explained why in the above overview. For more information on our designs please email info@schionningdesigns.com.au and our team will be happy to help.

INDIVIDUAL DESIGN TRIM

Each set of construction plans sold includes a unique trim sheet that is done using our CAD and hydrostatic software. The owners will discuss with me their individual equipment choices, and I will advise the best distribution options for each item. This is included in the cost of construction plans.

Kind Regards,

Jeff Schionning



G-Force 1800 'KATO' & SSS 'ZERO'



Wilderness 1340X 'CHEETAH'