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Design: The downside of lightweight efficiency

By Frances and Michael Howarth

Ambitious owners with deep pockets and innovative designers and naval architects eager to transfer technology are combining to put yachting into the front line of design trends.

As the cost of fuel rises, designers of motor boats are copying the underwater hull attributes of sailing yachts and investigating lightweight materials to improve efficiency.



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With the demand for superyacht speed rising, so the price of fuel propels itself into cost calculations.

Ever aware of [green issues](#) and the need to cut ostentatious fossil fuel use, owners are trying to build yachts that are more cost-effective.

One solution is to reduce the weight of the boat. Danish Yachts in Skagen, Denmark, has met this difficulty head on by converting hull production away from traditional materials such as steel, aluminium and fibreglass and mastering the science of building in carbon fibre.

Spurred on by Carlos Peralta, the Mexican millionaire, and using Espen Oeino, the Norwegian designer, Danish Yachts built Moon Goddess using carbon fibre.

The high-speed yacht has cabins, designed to regularly sprint from Portofino to Sardinia.

The shipyard, hoping to find a buyer for a completed yacht, decided to build another, bigger, better and more multifunctional craft out of the same material, again designed by Mr Oeino.

Today the 38-metre Shooting Star is, at 48 knots, probably the fastest, fully equipped twin engine motor yacht in the world of its size.

For sale at €18.5m, the boat is blazing a trail for the builders, who are demonstrating that their expertise has real practical application.

In the effort to produce efficient speed, the alternative to weight cutting is to alter the underwater profile.



Philippe Briand has created a new breed of lightweight motor yacht

Philippe Briand, the French designer, has a string of high-speed racing yacht designs to his name and has recently used his experience with fast sailing hull design to create a new breed of motor yacht.

Branded Vitruvius and built by the Picchiotti yard owned by Perini Navi, the Italian superyacht builder, these sleek motor boats are proving they can cut fuel costs by more than 30 per cent compared with those of similar length with wider beams. Employing a hull design that he has both stretched and optimised, Mr Briand has created a more efficient hull shape.

“Each yacht has an efficient ratio of superstructure to hull; built out of steel and aluminium, they are as a result lightweight, consume less fuel and have lower carbon dioxide emissions than other boats of a similar design,” says Mr Briand.

“Each hull is designed for maximum hydrodynamic efficiency to reduce water resistance and increase the length at the waterline. The optimisation of volume and weight distribution allows for lower fuel consumption and therefore a more environmentally-friendly long-range yacht.”

Paul Aston, editor of SuperYacht World, summed up the need for super slippery hulls, saying: “Owners and designers are driving the development of high-performance hulls, not because they want more out and out speed, but because hulls like these burn less fuel.

“It’s a win-win situation; both running costs and carbon footprint are reduced, and the yacht is able to cruise much further afield so is no longer tied to expensive and increasingly oversubscribed superyacht marinas.”

Michael Leach Designs (MLD) has won industry awards for the design of both the exterior and interior of its latest launch, the 96-metre Palladium.

Mr Leach says many experienced owners have a wealth of knowledge coupled with the desire to create their own dream yacht. But they often need help.

“We have a client wanting to include the very latest in technologies and efficiencies in his new 70-metre motor yacht, but we have to be very careful about how much of this has been tried and tested.

“Imaginary efficiencies in narrow sleek hulls can lead to stability issues, raising the fuel burn on the generators to run stabilisers, this has other knock-on effects too,” says Mr Leach.

Mark Smith, business partner at MLD, says owners sometimes get led astray by green issues, believing that their yachts must be super efficient at all costs.

“They forget that the characteristics of the sea they sail in have not changed in centuries, so that trying to evolve too far away from the tried and tested hull designs can, at times, be a pointless exercise.” He adds: “Sailing into heavy weather aboard some yachts with super fast slippery hulls is akin to driving a Formula One race car across a ploughed field.”

Frances and Michael Howorth are specialist travel writers and superyacht experts who write for Superyacht Magazines.

Their website is www.thehoworths.com