

TAG 60

**Gurit helps TAG Yachts achieve the ultimate goal of balancing performance and luxury.**

Boat design usually requires some sort of compromise – low weight can be achieved but usually at a cost, where a comfortable fit-out is required there is usually a weight penalty. The design process allows the designer to establish what the priority is for the client and what level of compromise, and in which areas, is acceptable. TAG Yachts, however, believes that in the TAG 60, designed by Greg Young, they have found the perfect balance for a boat owner that wants a real sailing experience without compromising on the finishing and fit out. Described by TAG Yachts as a “luxury high performing sailing catamaran”, the TAG 60 is credited with impressive top speeds for a cruising catamaran, yet its real performance benefit is its ability to sail well in light airs. It features sailing characteristics untypical for such

a catamaran such as regularly outpointing larger monohulls due to its centreboards, powerful sail plan and rotating wing mast; reaching at broader wind angles due to the slim hulls and once again the sail plan and rotating mast; and deep downwind sailing similar to a racing catamaran. TAG Yachts describe their 60 as a yacht that ‘is designed for the sailor who enjoys sailing’. However, production catamarans with this sort of exhilarating performance capability often have relatively sparse fit outs, requiring weight savings to achieve the performance.

So how do TAG Yachts achieve both performance and a superyacht level of interior fitout?

Whilst most modern production catamarans are made of glass fibre (either single skin or cored sandwich construction), TAG Yachts selected carbon fibre fabrics, with Corecell™ structural foam and epoxy resins for the TAG 60. “Opting for

these high performance materials, all supplied by Gurit, plus vacuum consolidating and post-curing the laminates, meant that we could achieve the excellent structural properties of a strong and stiff performance yacht," says Doug Koch of TAG Yachts. "Saving weight in the primary structures, and being smart with our choice of materials for the interior, has allowed us to fit out the yachts to a superyacht standard – without compromising on sailing performance." The interior fit-out certainly is impressive and doesn't skimp on luxury. A modern European style dominates, with a large open plan galley/living area, and a fully enclosed salon unlike many other modern cruising catamarans. Four cabins, three bathrooms (each with individually controlled air-con, LED lighting and other such features), complete the interior.

Working with Gurit was a critical step on the path to achieving this 'perfect' balance of performance and luxury. Gurit's Structural Engineering team was engaged by designer Greg Young from an early stage in the project. "I have worked with Gurit for 20 years," New Zealand-based Young says, "so they were the obvious partner for such an ambitious project. They have a huge amount of composite design experience and the necessary skills and resources to help us meet our brief."

As well as providing a light and extremely rigid performance sailing platform, carbon fibre construction was critical in the successful realisation of many of this remarkable yacht's innovative design features. The signature Greg Young exterior styling combined with the open plan living space provided numerous engineering challenges on a boat that is capable of flying a hull.

After completion of the preliminary structural design, finite element analysis (FEA) was used extensively in the analysis of the global loads on the vessel and optimization of the structure. This ensures the vessel's bulkheads, hull and superstructure, forebeam and prod all work in unison, whilst not imposing on the interior space. The mast bulkhead, often a solid or near-solid bulkhead on a catamaran of this size, posed an interesting challenge for the engineers – how to provide the required support for the mast whilst not impacting on the interior design. FEA was once again employed to refine the all-carbon bulkhead design, producing a structure that could safely support the massive mast compression loads generated by this design, while the passengers move through the opening in the mast bulkhead without any sense of the magnitude of loads being transmitted just over their heads.

The hull and deck of the TAG 60 are constructed of carbon fibre reinforcement fabrics, wetted out with Gurit's Ampreg 22 epoxy laminating resin, either side of Gurit's Corecell™ M-Foam. "Gurit's Ampreg 22 resin system has worked extremely well for us," says Young. "The range of hardeners



Stardust is the second TAG 60 to be launched. Her owner is an experienced multihull sailor, who is now enjoying extensive European adventures as well as some regatta racing.

allows us to adapt the system to suit the part being built." Corecell™ M-Foam is an ideal choice of structural foam for designers and builders requiring a lightweight, yet stiff structure. The core acts as an I-beam, separating the skins of the laminate, in this case the carbon fibre, maintaining the shear connection between them, and therefore creating a stiff laminate whilst maintaining a lower weight than if the builder had to build up reinforcement layers to meet the same stiffness.

Weight was a key consideration throughout the design of the TAG 60, with carbon centerboards and a carbon lifting platform for the tender also engineered by Gurit to develop the most efficient laminate specification for the required performance. Of course, an efficient structural design and specification is all very good on paper, but the builder then has the task of ensuring the build process adheres to the plan. At TAG Yachts, quality control is integral to the business, with regular checks conducted on the shop floor and samples tested in professional laboratories to ensure the Gurit designs are followed and CE standards met. By keeping the whole of the production process in-house, from the laying of the first fibre in the mould, to the final painting and upholstery fitting, TAG Yachts has complete control over the process and quality. In addition, the company maintains close relationships with its suppliers, such as Gurit, to ensure that practices are current and developments are pursued so that the final product remains at the top of its game. "Gurit is the ideal composites partner for me as a designer and TAG Yachts as a builder," continues Young, "they offer the most comprehensive product range and are always at the leading edge of material technology. This, combined with a proven depth of engineering knowledge, creates an unbeatable combination for any composite project. More than just a materials supplier, Gurit offers service and support levels that are second to none."