



THE iQ TECHNOLOGY® PERFORMANCE ADVANTAGE

Quantum Sails has one of the most comprehensive programs in the industry dedicated to technological advancement. The result is state-of-the-art technical capabilities for delivering data-driven solutions to enhance sail and boat performance for sailing’s “Top Guns” and all types of boats, from dinghies to super yachts.

THE PROVING GROUND

More than ten years of sail shape analysis and verification of performance targets with the Quantum Racing TP52 program has provided an unprecedented opportunity to validate the company’s iQ Technology capabilities ensuring outcomes delivered with the highest level of accuracy, reliability and confidence.

CUSTOMIZED SOLUTIONS, UNIVERSAL BENEFITS

Quantum’s sail designers rely on iQ to develop sailing solutions for a broad range of scenarios. While the objectives vary and deliverables are customized to each project, iQ speeds up the design work and delivers demonstrable results including better performance, shorter project timelines (no “hit or miss” attempts at fitting sails) and cost savings.

OBJECTIVE	DESIGN ANALYSIS	BENEFIT
Refine sail structure for a particular application before the boat hits the water.	Observe stress and strain within the sail.	Save time and reduce costs. Deliver best structural performance (weight/resistance).
Optimize sail structure for a particular application and wind range before the boat hits the water.	Predict flying shapes and performance consequences.	Deliver out-of-the-bag performance with the best fit—size, shape, structure. Reduce cost.
Provide yacht designers and equipment vendors with essential information for finalizing deck layouts and hardware specifications.	Evaluate structural loads throughout the sail and at all attachment points.	Enable integrated and optimized boat performance. Increase efficiency and reduce cost.



TECHNOLOGY IS DEMOCRATIC

“Technology is democratic because it always reaches the end user,” is a favorite saying of Joan Subirats, Quantum’s head of technology in Barcelona. He’s referring to the trickle-down effect of technology and its influence on a broad range of projects that benefit sailors of all kinds.

At the top of the racing pyramid are classes like the TP52 where Quantum Racing has achieved an unmatched level of accomplishment at the Grand Prix level, winning more events, season titles and world championships over the past ten years than any other TP52 program. But the lessons learned on the grand prix circuit are also applied to many other types of projects such as the following.

NEW BOAT BUILDS: COLLABORATION & EARLY-STAGE COMMUNICATION

Increasingly, Quantum sail designers are collaborating with boat designers and rig/mast designers from the start of a new project. The resulting “design loop” delivers greater efficiencies and better results benefiting every aspect of the new build. Starting with an initial design from the boat designer, the rig/mast builder optimizes the mast. This package is passed onto the Quantum designer who analyzes the forces to provide feedback to the group for the next design. This iterative process continues until the boat reinforcements are well defined along with the mast EI and the shape and area for the proposed sail inventory.

Quantum works with several boat designers, among them Botin Partners and Judel/Vrolijk and mast providers including Southern Spars, Hall Spars and Selden.

ONE DESIGN: SEARCHING FOR SPEED

For one design classes, iQ has been applied to a variety of projects yielding fast sail shapes, better boat speed and podium finishes. Studies have been completed for several Melges designs, various J/Boat models, C&C 30, RC44, Swan, Reichel/Pugh and others.

OPTIMIZING FOR RATING RULES

For racing programs, optimization studies can be used to analyze the effects of potential rating rules on sail selection, design, and sizing to deliver speed and a rating advantage.

CRUISING PERFORMANCE

For cruising yachts, ideal sail shapes are derived through iQ to provide better sail and boat handling; this translates to a more comfortable and enjoyable cruising experience. Also valuable to cruisers carrying small inventories are iQ studies evaluating the response of proposed sails in a wide range of wind angles and conditions. With fewer sails covering a broader range of situations, designers say the performance demands on cruising sails are even greater than racing.

SPEEDING UP THE LEARNING CURVE

Using iQ’s virtual modeling and animation capabilities, a highly effective training tool for the 470 was developed for young sailors. The interactive program simulates the cause and effect of sail trim controls, illustrating principles that aren’t always easy to see under sail. Considered a breakthrough training tool, work is underway to develop similar programs for other dinghies.



CUSTOMER PROJECTS

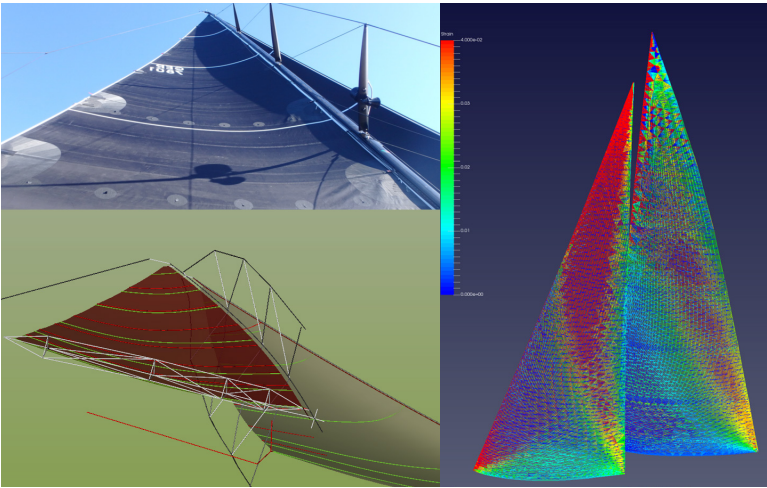
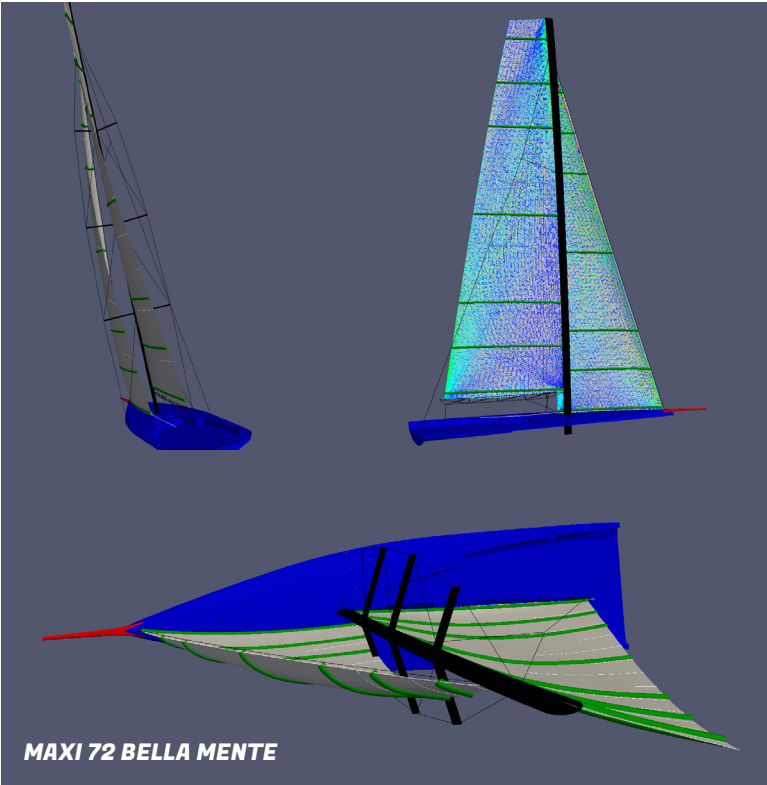
Following is a sampling of current and recent iQ projects for new boat builds. The iQ work for these programs includes the following elements:

- 1 Determine optimal sail shape based on boat specifications.
- 2 Compute and visualize the aerodynamic forces, wind angles and velocities, and distribution of air pressure.
- 3 Complete structural analysis and fiber mapping to determine optimal flying shape and fiber layout.

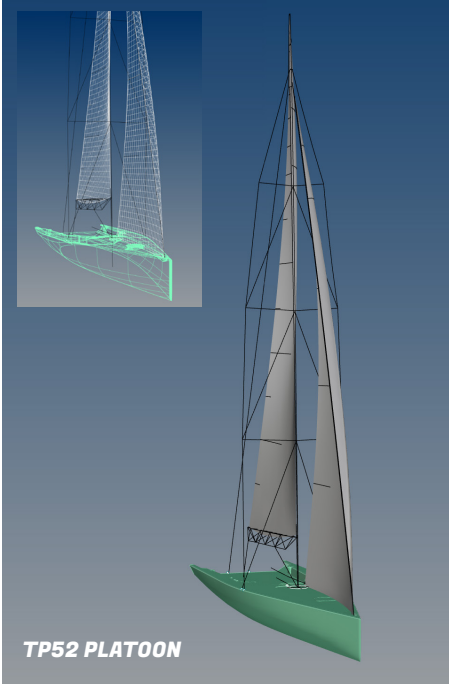
For the highest level racing programs, a fourth phase with a

Velocity Prediction Program (VPP) is completed to balance hull and sail forces. This involves advanced aerodynamic and hydrodynamic modeling to study the impacts of rig position, rake, heel, rudder angle and other variables on the sail shapes for all sails in the inventory.

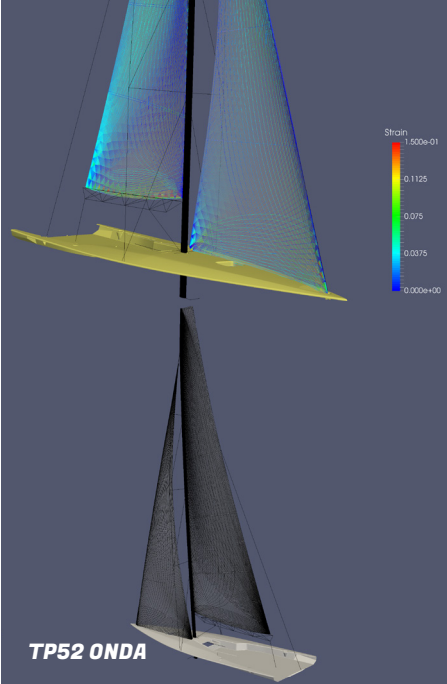
The end result: Sails that are perfect in size, shape and structure right out of the bag and optimal performance on the water.



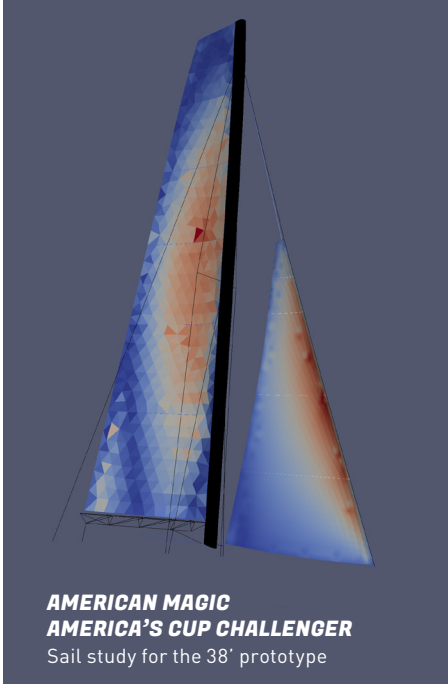
CUSTOMER PROJECTS



TP52 PLATOON



TP52 ONDA



AMERICAN MAGIC
AMERICA'S CUP CHALLENGER
Sail study for the 38' prototype



IMOCA 60 MALIZIA II



MAXI 72 MOMO