Sector:
One design offshore racing (ClubSwan 50)

Project Challenges:
Exploit the class regulation and design the complete set of sails before the boat was available

Key to success:
Possibility to simulate the sailplan in a virtual wind tunnel and calculate the effective deformation considering the layout of the fibres, the x-ply and the film

Result:
compete at the highest level competitions and win

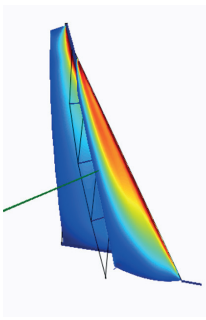
Using SA-Evolution to design winning SWAN50 sails - the 3FL experience

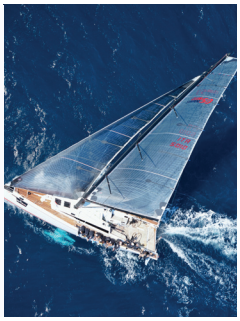
In 2016 3FLSaildesign has been contacted by one of the customers to face the Swan 50 challenge. His request was to apply 3FLSaildesign's ability to design, develop and optimize the sails to this new futuristic class. The project then started in 2017, when the class was born. To ensure the customer with the best possible performance of the sail plan, 3FLSaildesign decided to use a new tool, which has now become crucial in the design of every sail they produce: SA EVOLUTION by Smar-Azure Ltd. This program is an extension of the structural analysis module (FLEX), allowing the study of string sails.

Initially 3FLSaildesign examined the sail plan from a theoretical point of view, not yet having the boat available for measurements and tests, trying to exploit the class regulation to our advantage, preceding other sailmakers.

After having collected all useful information about the sail plan, the class rules and the boat, 3FLSaildesign developed several different mainsail and jib designs and proceeded with the numerical analysis. Attention has been focused on understanding the aerodynamic efficiency and the deformation that the sail undergoes; the SA EVOLUTION module is in fact the only program that allows, starting from the aerodynamic analysis, to consider the sail as a membrane and calculate the effective deformation of the sail considering the layout of the fibres, the x-ply, the film and the glue.

The feedback from the results of the aerodynamic and structural analysis of the string sails were applied back to the sail designs, optimizing the shape and fibre layout to achieve the maximum forward thrust





and aerodynamic efficiency of the sail plan, and the minimal deformation (in detail 3FLSaildesign focused their attention on the aerodynamic coefficients, maximising the pressure coefficient, the lift coefficient and the drive coefficient and minimising the drag coefficient and side coefficient)
Following the design, analysis and optimisation, 3FLSaildesign developed and produced the first set of sails. The design has been further refined by water tests and regattas.

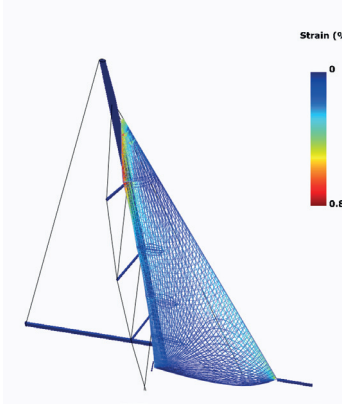
This enabled 3FLSaildesign to compete at the highest level and succeed in the following important regattas:

- The Nation's Trophy, 2019, 1st place (tied with Lionheart)
- Monaco Club Swan 50 Trophy, 2nd place

3FLSaildesign is a quality craft company, whose products, today, are conceived, designed and processed in view of the challenges of tomorrow. They have participated in many competition and won some.

SA Evolution brings a new level of science to the 'art' of fibre layout design. By virtually simulating the aero-elastic behavior of sails in up-wind sailing conditions, comparing alternative fibres and layouts, and analyzing the resulting sail shapes, the optimal fibre layout distribution can be achieved.

SMAR Azure develops innovative software solutions for the marine industry, working as technological partners to meet the needs and requirements of the industry



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