SMAR Azure Ltd

Azure FLEX

Flex is a unique software module enabling leading sail designers to create fast sails. It gives you control of a robust optimization method that explores the complex interaction between wind and flexible sail-shapes. Flex enables the aerodynamic, structural and aeroelastic analysis of upwind sails.

The Method

The Aeroelastic method for achieving optimal sails is very accurate.

With comprehensive simulation and analysis features Flex calculates the flying sail shape of your proposed sail design.

Cutting-edge technology is used to calculate loads, stress and deformation. Then, user-friendly tools enable the sail designer to modify the initial design and see the result of these changes.

Lift, drag and side forces are shown graphically, making it easy to see whether a change to the final mould shape, construction or trim will have a beneficial effect.

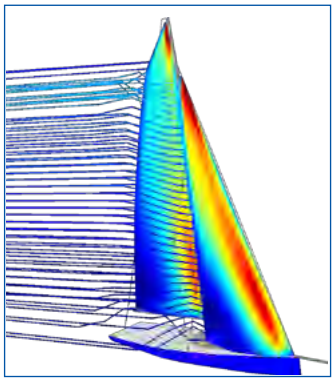
Optimization process

Step 1
Design

Using AzureDesign or AzureProject you can design:

- Hull and coach roof
- Complete RIG
- Mainsails & Genoas
- Patches/Panel layout & development

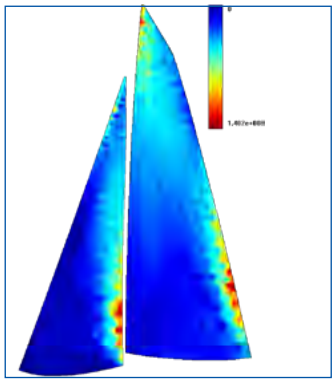
Step 2
Is it fast?



Then, you can input:

- Apparent True Wind Speed (AWS)
- Apparent True Wind Angle (AWA)
- Sailing course angles
- Now you can START the aerodynamic calculation of DRIVE and SIDE forces.
- Pressure force

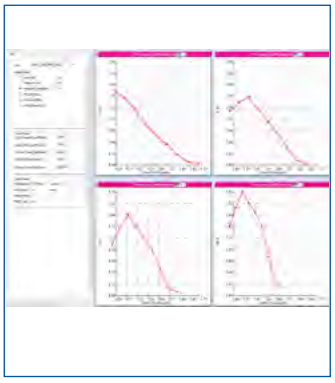
Step 3
Flying sail shape



You can set:

- Aerodynamic forces
- Sailcloth
- Trimming conditions
- Now you can START the calculation of the flying sail-shape and stress distribution over the sail.

Step 4
Performance



Performance:

- Final flying sail shape
- DRIVE and SIDE force
- STRESS distribution/ Corner loads
- As sail shape changes AzureFlex automatically calculates the new pressure force and the final flying sail shape in equilibrium with these forces

Flex provides a number of useful results:

Pressure due to wind: distribution over the entire sail and each sail section

Aerodynamic forces: Lift and Drag

Sailing forces: Drive and Side

Flying sail-shape

Stress Distribution over the sail

> "Analytical tools are good on two counts: they allow you to compare different cloth manufacturing products against each other, as well as checking the flying shape. I use them a lot with my customers to show them the different trimming techniques."
>
> CHRIS OWEN (SAIL TRIM COACH)

All results are available in both graphical and numerical formats and can be saved and resumed at any time.

Sail designers can examine the effect of the sail structure and improvements to the sail's flying shape.

All data is generated and computed by considering the exact features of each sail and its behaviour in any sailing condition.

Main benefits

Knowing the intensity and distribution of the wind force over the sail lets you:

- Change sail-shape geometry to obtain a higher DRIVE force
- Discover which sailcloth develops the optimal sail shape
- Monitor SIDE force and STRESS distribution
- Reinforce sailors' loyalty via the visualisation of the results of the aeroelastic analysis
- Win competitive advantage thanks to the improved quality of the manufactured sail
- Reduce design and tuning time

System Requirements

Microsoft Windows® XP (SP2) (or newer)
Pentium® III (or equivalent) or newer
512MB RAM minimum, 1GB recommended
3D Graphics Accelerator, which is OpenGL compatible (ATI or NVidia preferred)

ABOUT SMAR AZURE

UK-based and founded 10 years ago by Dr Sabrina Malpede and Dr Alessandro Rosiello, SMAR Azure has grown substantially over the years in terms of its team of dedicated professionals, yachting-specific technology and product portfolio. Our R&D team comprises three expert software developers and three specialists in CFD and FEM/FEA. Our products and services have been chosen by over 180 clients in 27 countries and across various segments of the yachting industry.

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