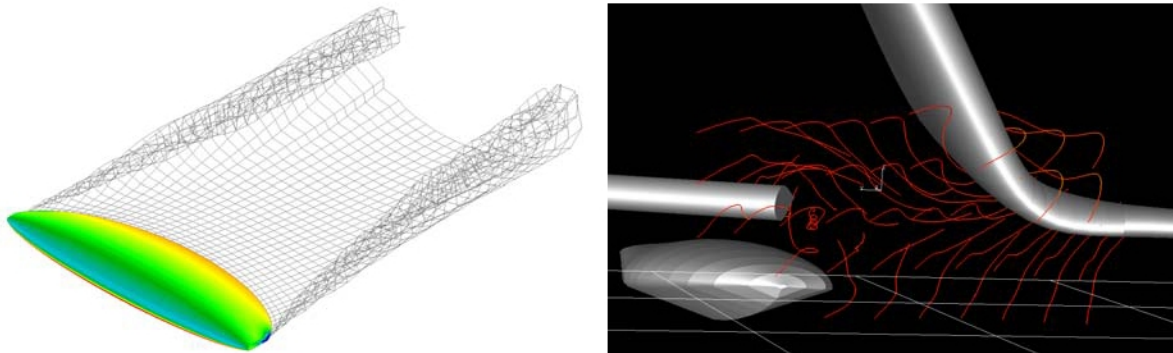
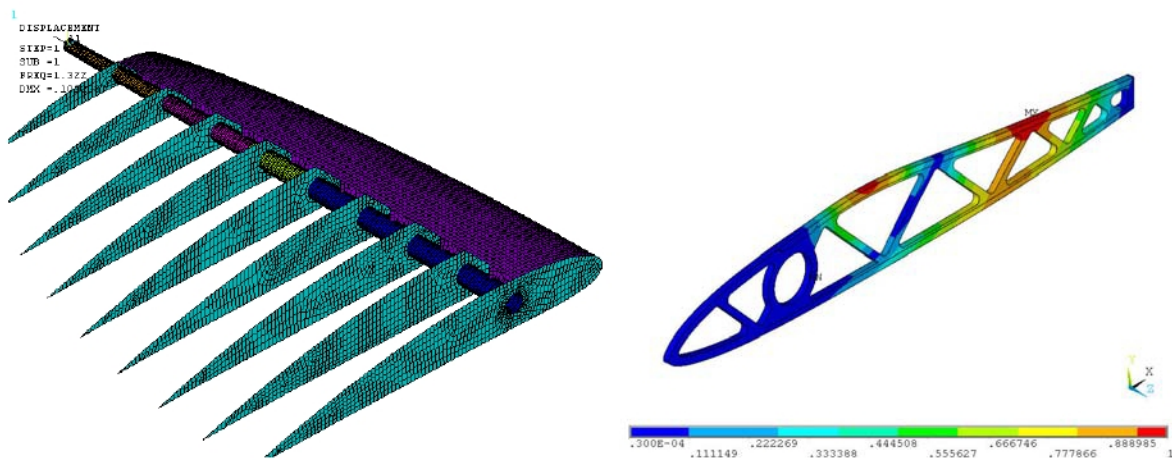


Case study "Sailrocket": World's Fastest Sailboat
Principal Designers: Aerotrope



Aerodynamic design and analysis using NewPan panel methods code



CFRP/GRP structural design and analysis using Ansys FEA



Boat at speed spot in Walvis Bay, Namibia



Sailrocket photos © Helena Darvelid/ Sailrocket

Aerotrope has been part of the Vestas Sailrocket team since the beginning in 2005.

Our engineers designed the wingsail for VSR1 and VSR2, as well as its fuselage and the hydrofoil.

For Vestas Sailrocket 2 we were principal designers, co-developing several concepts and taking part in final selection.

Sailrocket 2's main innovation lies in the way in which the sail and keel elements are positioned so that there is virtually no overturning moment and no net vertical lift. The record breaking speeds were achieved when fences were added to the base cavitating hydrofoil during the sailing campaign November 2012.

Aerotrope set about designing the new platform and rigid wing, and took on the re-design of the foil after the first version did not produce the expected results. Our engineer Wang Feng wrote a performance prediction programme (PPP) that ensured we could avoid stability problems (such as the crashes and backflip of the first Sailrocket) while pushing for maximum speed.

Our calculations confirmed that we should move VSR2's aerodynamic centre behind the centre of gravity, which was not the case in Sailrocket I. With the new design, the point of becoming airborne was no longer a problem for the boat.

Sailrocket 2 finally broke the outright world speed sailing record three times during its sailing campaign in Walvis Bay, Namibia, in November 2012. The course in this lagoon is only just long enough to ratify the official distances of 500 meters or the nautical mile (1,852 meters).

The Records:

12th Nov: 61.92 knots peak, 54.08 knots average over 500m. (Class B record)

16th Nov: 64 knots peak, 52.53 knots average. (Outright World Record No.1)

18th Nov: 63.98 knots peak, 59.33 knots average over 1,852m. (Nautical Mile Record & Outright Record No.2)

24th Nov: 68.01 knots peak, 65.45 knots average (75.3 mph/ 121.2 kmh), over 500m (Outright World Record No.3).