



CASE STUDY /

Ansys Composites Capabilities Help Reduce the Weight Of a Luxury Superyacht — AR Engineers GmbH

“Luxury superyachts must be designed to meet rigorous weight requirements so that these exceptional vessels perform in the way their demanding owners expect. In developing an initial design that would result in an overweight yacht, our team used Ansys Composite PrepPost to design doors from composites materials to reduce this weight. The software helped us deliver a preliminary door design from this new material within five days so that cost estimates could be generated. In the end, the doors’ weight was decreased by 70%.”

Axel Reinsch
CEO / AR Engineers GmbH

Superyachts are designed, engineered and manufactured to perfection. Their high quality guarantees extraordinary handling in difficult sea conditions and combines maximum power with reduced emissions. This exceptional performance is often obtained by using carbon composites materials.

/ Technology Used

- Ansys® Mechanical™
- Ansys Workbench™
- Ansys Composite PrepPost™

/ Business Challenges

When the designers of a luxury superyacht calculated the weight of an initial design, the vessel was approximately 300 tons above goal. The designers asked experts at AR Engineers to find ways to reduce weight. Carbon composites are lightweight and have high strength, so the engineering team investigated using carbon composites materials for several access doors used by yacht crew and service members. The team used Ansys Composite PrepPost to determine feasibility and to optimize the composites design.

/ Engineering Solution

- Use Ansys Composite PrepPost to model and analyze the composite layup of the doors.
- Simulate the composites design using a parametric model from CAD.
- Show feasibility of the composite design under loading conditions required for certification by Germanischer Lloyd, the classification society for marine vessels.
- Analyze composite failure behavior, buckling and deformations.

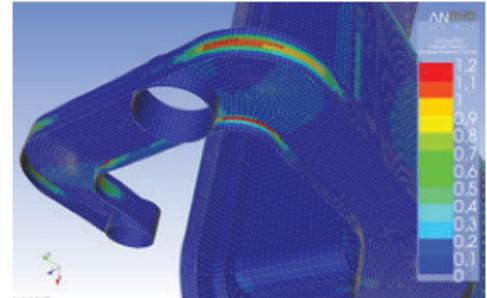
/ Benefits

- Ansys Composite PrepPost proved that the composites design was feasible so that a very accurate cost estimate could be provided within five days.
- The parametric model and intuitive composite workflow allowed simple design studies and quick changes to the composite layup.
- Ansys Composite PrepPost provided detailed evaluations of connection points.
- The engineering team reduced the weight of the doors by 70% using Ansys simulation to help the yacht meet weight specifications.

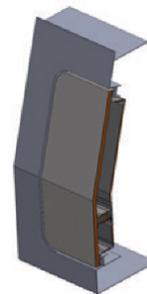
/ Company Description

AR Engineers supports customers worldwide in the development of lightweight products. The company works with industry leaders throughout the marine, automotive and wind energy sectors. With over 10 years of experience in design, simulation and implementation of composites products, the company provides extensive composites know-how combined with product planning and innovative technology.

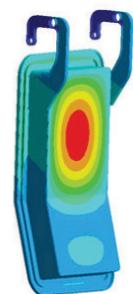
Simulation at AR Engineers GmbH is supported by Ansys channel partner CADFEM GmbH.



Ply-wise failure evaluation of composite layers.



CAD model of access door.



Total deformation of door due to water pressure.

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