

WORLD-FIRST COMPOSITE TRAM

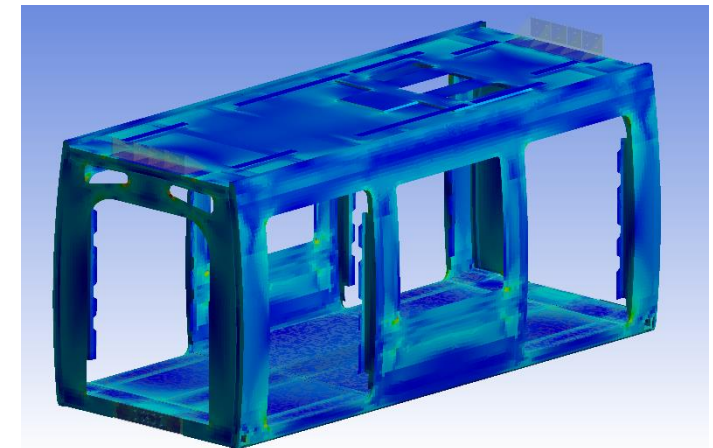


Problem

Fordyno embarked on an ambitious program to design a world-first carbon composite tram – engineers needed to deal with all **the challenges inherent in designing a complex composites structure**. Stiffness performance was found to be critical. Material needed to be added to limit deflections. Due to the cost of the material, it was important to optimise the location and fibre orientation of the individual plies which required many design iterations.

Solution

Using the advanced Ansys Composite PrepPost interface, Fordyno engineers were able to analyse many different lay-up configurations. Materials were strategically added in high strain areas and critical load cases were analysed to ensure that the composite failure criteria indices as well as the deflections were acceptable. The outcome was **a 40% weight saving** compared to the equivalent steel structure.



ANSYS Advantage

“With Ansys Mechanical, Ansys Composite PrepPost and our composites engineering expertise, we were able to analyse various strength, fatigue, deflection and modal load cases and evaluate the results on a ply-by-ply basis using project specific material test data. Unlike legacy tools our engineers have used, Ansys' parametric geometry changes along with ANSYS ACP and bonded contacts allowed us to assemble complex composite structures. **I am confident that we could not have achieved this world-first composite tram in such a short timeframe without our use of Ansys**”.

Karsten Jarke, Engineering Manager, FORDYNO

