



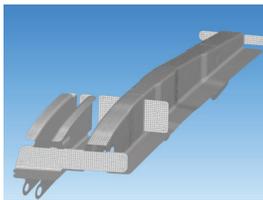
ANSYS® + EADS Innovation Works

As a leading global aerospace and defense company, EADS depends on the development and integration of state-of-the-art technologies in its products to provide the necessary competitive edge. We are using ANSYS software to develop composites that reduce aircraft weight. Using ANSYS Composite PrepPost within ANSYS Workbench provides accurate results that allow us to reduce modeling time by up to 65 percent over traditional solid modeling.

Tamas Havar
*Manager Lightweight Design
EADS Innovation Works*

A leading global aerospace and defense company saves up to 65 percent modeling time over traditional methods using ANSYS Composite PrepPost.

Every pound of decreased weight in an aircraft translates directly into reduced fuel and, therefore, cost savings. When engineering aircraft and aircraft parts, weight savings can be achieved using light but strong materials in the form of composites. By making more aircraft parts with composite materials, aircraft manufacturers gain a critical edge in both economics and meeting green transportation goals.



Simulation model of load introduction rib

Business Challenges

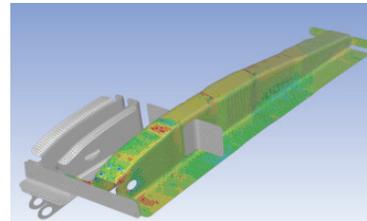
The load introduction rib (LIR) is part of an aircraft's wing flap. Aerodynamic loads are transferred through the LIR onto the wing. Engineers must analyze the wing flap under conditions of a jammed flap mechanism, a load scenario that traditionally requires a detailed model of the flap mechanism. To evaluate failure criteria of a composite LIR, engineers at EADS Innovation Works used an ANSYS Composite PrepPost model and a shell model, and compared accuracy and workflow efficiency with a traditional solid model.

Technology Used

ANSYS[®] Mechanical™, ANSYS Composite PrepPost, ANSYS Workbench™

Engineering Solution

- The composite design of the LIR was modeled using shell elements.
- ANSYS Composite PrepPost modeled the composite layup. This innovative approach allows modeling composites by building up plies in the same way that they are manufactured.
- Connections by rivets were defined based on CAD information using beam elements.
- The post-processing capabilities of ANSYS Composite PrepPost allowed evaluation of



Failure criteria for load introduction rib

failure criteria, including transverse shear stresses and interlaminar normal stresses.

Benefits

- ANSYS Composite PrepPost provided simple pre- and post-processing of composite designs within ANSYS Workbench, significantly reducing modeling times.
- A unique feature of the technology enabled evaluation of out-of-plane normal and shear stresses in a composite shell model.
- Concept studies of complex composite designs are possible without extensive simplifications.
- Comparison between the ANSYS Composite PrepPost shell model and the solid model showed nearly identical results.
- ANSYS Composite PrepPost and ANSYS Workbench allowed time savings of up to 65 percent over the traditional solid modeling method.

Company Description

EADS is a leading global aerospace and defense company, whose business depends heavily on the development and integration of state-of-the-art technologies in its products to provide the necessary competitive edge in its markets. A global network of Technical Capability Centres, collectively known as EADS Innovation Works, act as corporate Research and Technology (R&T) laboratories to guarantee the company's long-term technical innovation potential. The structure of this network is consistent with the EADS R&T strategy and encompasses the skills and technology fields that are of critical importance to EADS.

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