The first monocoque designs of the KTM X-Bow were engineered without the use of ANSYS Composite PrepPost. When we did employ the ANSYS software for composites, we were able to reduce the monocoque’s weight — a very important aspect of sports car design — by 20 percent.

Peter Martin  
CEO  
KTM Technologies GmbH
The KTM X-Bow is a unique and exceptional super sports car, developed by KTM Technologies. It is the world’s first production car with a monocoque, in which the external skin of the vehicle provides structural support. This monocoque is made from carbon composites materials.

**Business Challenges**

Light weight and high strength make carbon composites the ideal material for the car. Using composites allows KTM to reduce weight and achieve new safety goals. Engineering composite designs from concept to simulation and manufacturing is challenging. The process includes countless opportunities for engineers to choose materials, fiber orientation, manufacturing methods and layup arrangements. The KTM X-Bow monocoque is manufactured using more than 300 pre-cut composite plies. Developing one of the world’s most exciting and modern sports cars requires addressing these challenges in composite engineering.

**Technology Used**

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

**Engineering Solution**

- Use ANSYS Composite PrepPost to model and analyze the composites monocoque.
- Analyze different possible layups, fiber orientations and composites materials.
- Analyze the failure behavior of the composites design under different load scenarios.

**Benefits**

- The intuitive approach of ANSYS Composite PrepPost enables simulation-driven development of the composites monocoque.
- Simulation using Composite PrepPost starts with design concepts, includes the influences of manufacturing, and allows detailed evaluation of the monocoque.
- Different design studies of the composites layup are evaluated within a single day.
- KTM Technologies reduced the weight of the composites monocoque by 20 percent using ANSYS simulations.

**Company Description**

KTM Technologies GmbH was founded in 2008 to bundle competencies in high-tech composites engineering and design for the KTM group, a world leader in developing race-ready off-road and street motorcycles. With the development of the KTM X-Bow, the first four-wheel vehicle in KTM’s motorsports history, KTM Technologies demonstrates the company’s remarkable know-how and success in the field of high-performance composites.

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