Ansys

CASE STUDY /

Expediting Brake Rotor Design Cycle through Ansys Workbench Templates – TRW

"Implementation and use of Ansys Workbench templates have resulted in substantial benefits in design development productivity and competitive advantage for TRW Automotive. It represents the next evolutionary step for CAE in the engineering process."

Greg Roth
Sr. Engineering Manager CAE / TRW Automotive North America

CASE STUDY

TRW Automotive is among the world's largest automotive suppliers and one of the top financial performers in the industry. The company supplies more than 40 major vehicle manufacturers and holds leading positions in all of its primary product categories, including braking systems.

/ Challenges

Vehicle manufacturers require virtual and empirical validation for request for quotation (RFQ) design proposals. Maturity of proposal is often a deciding factor for new business awards. To remain competitive, suppliers must become more efficient. These requirements have driven the necessity among the automotive supplier base to further leverage and expedite upfront CAE.

By developing a design set, a supplier improves its chances for meeting OEMs' business and engineering targets. This translates into evaluating multiple design concepts. A traditional CAE process, which involves a sequential approach to pre-processing, solving and post-processing, takes too long and is inefficient, since the steps must be repeated over and over for each design concept and across various analysis types. If final analysis does not meet performance targets, the process must be started over and valuable time is wasted.

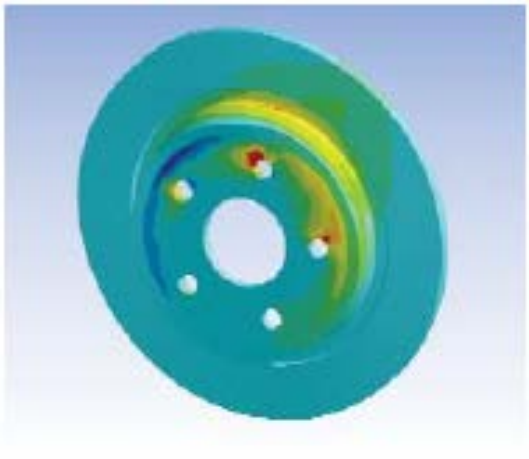
/ Technology Used

- Ansys® Workbench™
- Ansys® Mechanical™

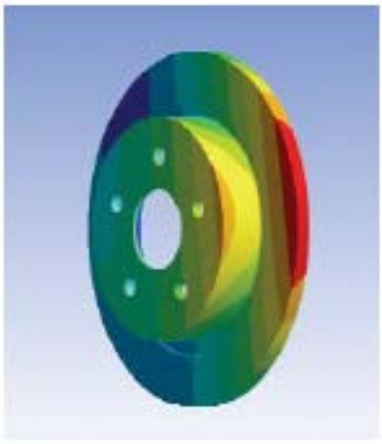
/ Engineering Solution

TRW has developed a novel approach for evaluation of brake rotor designs that greatly improves analysis throughput and expedites the design cycle. A custom template that captures various analysis types specific to brake rotor design needs was built within the Ansys Workbench environment. The brake rotor template automatically reads in CAD model, applies loads and boundary conditions and runs the entire analysis suite. The template approach allows for:

- Simultaneous design evaluation of thermal, stress and dynamic performance.
- Concurrent development of multiple design proposals.
- Full assessment of design performance.



Stress analysis results.

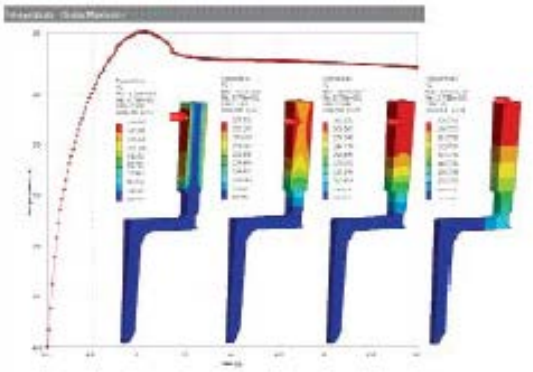


Modal analysis results.

/ Benefits/Results Achieved

The key benefits of the Ansys Workbench template-based approach are:

- Increased automation.
- Increased design and analysis throughput.
- Analysis brought to the upfront of the design cycle.
- More thorough evaluation of design proposals.
- Over 90% reduction in FEA analysis time.



Brake rotor thermal analysis results.

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