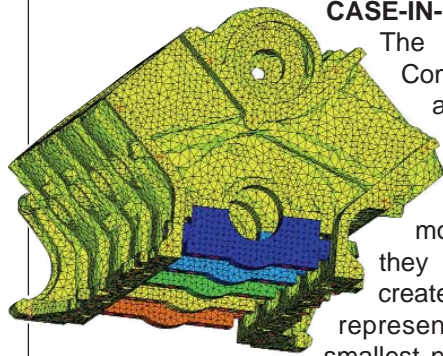


Integrated Simulation Solutions for the Automotive Industry

AUTOMOTIVE

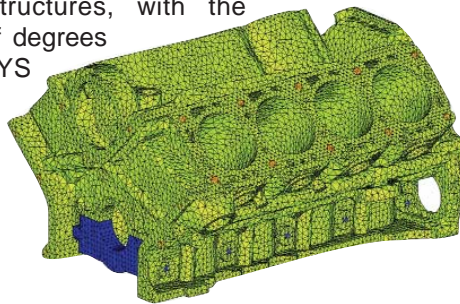
The automotive market is ever changing. Vehicle manufacturers are constantly looking to provide better looking, better performing and more cost-efficient transportation. This automotive “drive” requires new and better technology along with robust and quicker processes. With the need to design more vehicles in a shorter amount of time, CAE is a requirement, and ANSYS, Inc. can solve the challenges.

CASE-IN-POINT



The Engine NVH Analysis Section at Ford Motor Company is responsible for providing CAE design analysis support. Because program timing is being compressed on a regular basis, the demand for quick turnaround on the design analysis is constantly growing. As finite element models become bigger (more degrees of freedom) they tend to drive the analysis time longer. This creates the need for quick FE models that accurately represent the structures, with the smallest number of degrees

of freedom an absolute must. ANSYS AI*Environment was used to build the models in a matter of hours, not days.



ANSYS Simulation Solutions

- ▶ ANSYS® DesignXplorer™
- ▶ ANSYS® Emag™
- ▶ ANSYS® CFX®
- ▶ ANSYS® Mechanical™
- ▶ ANSYS® ICEM CFD™
- ▶ ANSYS® AI*Environment™
- ▶ ANSYS® Multiphysics™

*“One of my recent projects required me to perform a DOE study on a new cylinder block for a program with compressed timing. The DOE required me to build 17 different FE models (tetrahedral elements) of the cylinder block in order to evaluate all the design variables. In the past each block model would have taken over one week to complete. But using ANSYS AI*Environment, I was able to complete two models per day — which resulted in completing the DOE study in time to have the first prototype blocks contain the best combination of all the design features. ANSYS AI*Environment helped me put CAE where it belongs, up-front driving the design.”*

– **Emmett Holmes**
NVH/CAE Analyst
Ford Motor Company

ANSYS provides solutions to:

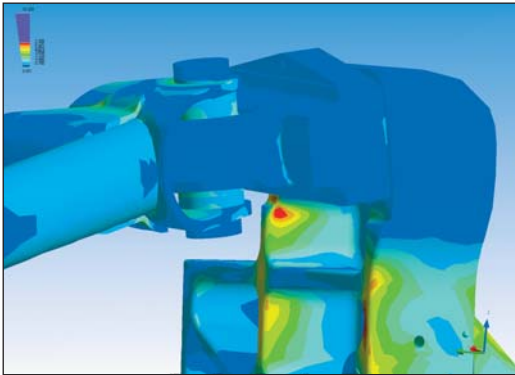
- ▶ Help reduce physical prototype through the use of CAE virtual prototypes
- ▶ Design-level CAE for up-front analysis of large assemblies of parts, providing CAE virtual prototyping of design changes
- ▶ Defeature and simplify assembly-level models to quickly create CAE models for analysis
- ▶ Create in-cabin modeling to improve passenger comfort
- ▶ Create in-cylinder modeling to help in combustion
- ▶ Deal with scan data from STL to use for milling or CAE analysis
- ▶ Optimize a design by comparing multiple design alternatives at one time to lower vehicle weight, optimize component strength and more

CASE-IN-POINT

ANSYS technology is a key part of Pratt & Miller's success in using simulation-driven design throughout its process of developing winning racecars and continually improving vehicle performance. Fast turnaround of development projects is essential in the racing business to minimize vehicle downtime and implement improvements as soon as possible, often in a matter of hours. Features such as automatic contact element-generation enable Pratt & Miller to study suspensions,



powertrains and other complex assemblies quickly and accurately.



ANSYS study of an automotive front suspension shows a high-stress area as a red hot-spot in which the upright fails on impact.

About ANSYS, Inc. Solutions

ANSYS designs, develops, markets and globally supports engineering simulation solutions used to predict how product designs will behave in manufacturing and real-world environments. Its integrated, modular and extensible set of solutions addresses the needs of organizations in a wide range of industries. ANSYS solutions qualify risk, enabling organizations to know if their designs are acceptable or unacceptable — not just that they will function as designed. ANSYS helps organizations achieve:

- Innovative and high-quality products and processes
- Fewer physical prototypes and test setups
- Faster return on investment due to reduced development time
- A more flexible and responsive information-based development process, enabling the modification of designs at later stages of development
- A front-end simulation strategy that offers a superior method for bringing products to market in less time and with fewer costs

The ANSYS Advantage

ANSYS software provides customers with a competitive advantage:

- ▶ Lowering the cost to do CAE analysis by providing wizards and process-based tools to reduce training time and analysis hours
- ▶ No CAD, no problem. ANSYS can take faceted scan data and use this as geometry to create an analysis model
- ▶ High accuracy CAE hex models to provide better correlation to physical tests
- ▶ ANSYS® Workbench™, which provides a unified product development environment offering integration across a wide range of design processes — ranging from geometry modeling and editing, meshing and pre-processing, advanced analysis (structural, thermal, electro-magnetics, CFD, etc.) and robust design optimization
- ▶ Specialized tools for cabin modeling, combustion modeling, wheel tools and more — with a scripting environment to help tailor these tools for focus areas

About ANSYS, Inc.

ANSYS, Inc., founded in 1970, develops and globally markets engineering simulation software and technologies widely used by engineers and designers across a broad spectrum of industries. The Company focuses on the development of open and flexible solutions that enable users to analyze designs directly on the desktop, providing a common platform for fast, efficient and cost-conscious product development, from design concept to final-stage testing and validation. Headquartered in Canonsburg, Pennsylvania, U.S.A., with more than 25 strategic sales locations throughout the world, ANSYS, Inc. and its subsidiaries employ approximately 600 people and distribute ANSYS products through a network of channel partners in over 40 countries.



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