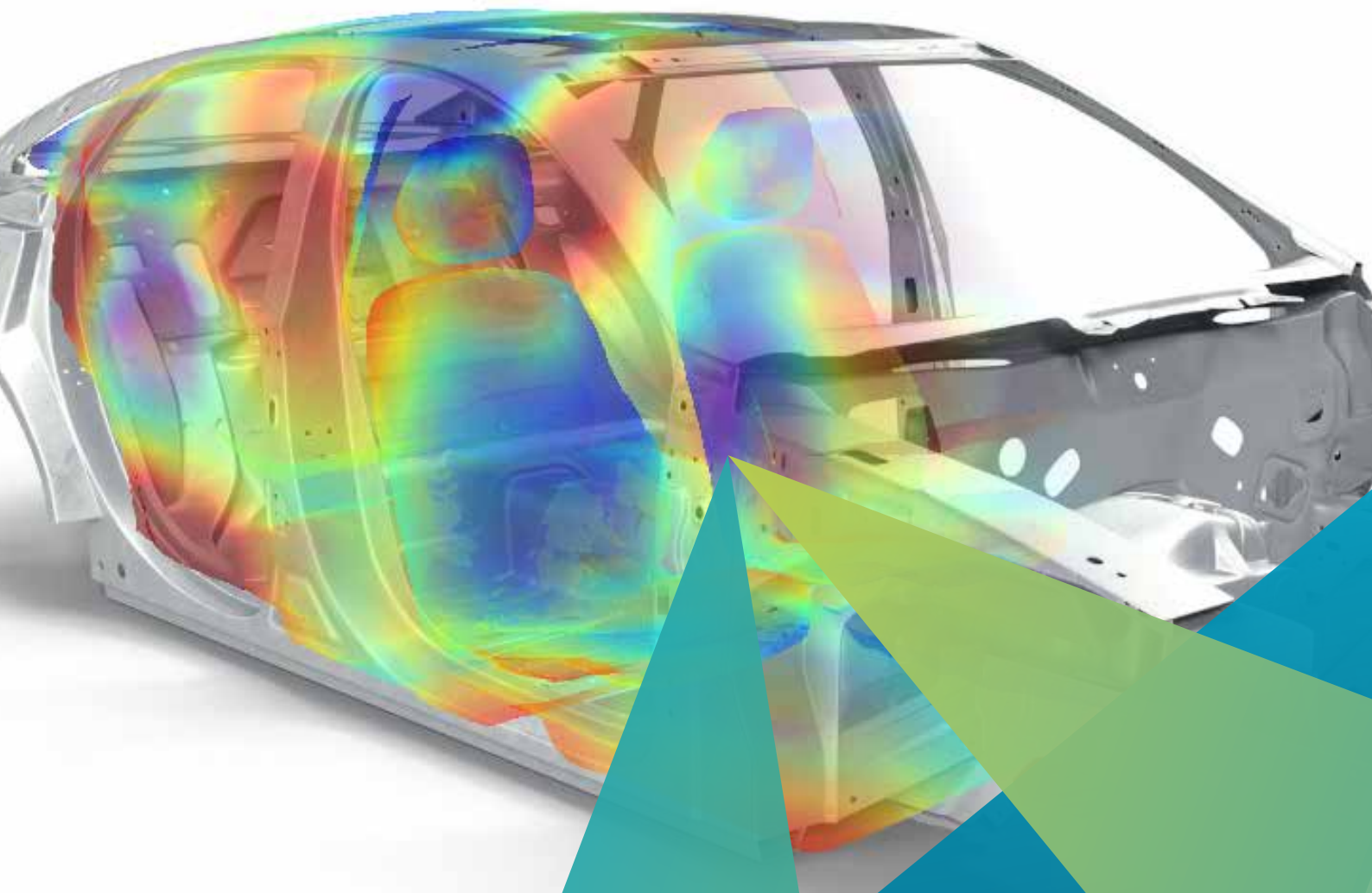


Actran for Trimmed Body

Advanced vibro-acoustic analysis combining Actran and Nastran



Product overview

Combine the strength of Actran and Nastran for advanced vibro-acoustic modeling

Actran is a powerful tool for modeling and analyzing complex vibro-acoustic systems and specifically trimmed vehicle bodies. Trim components are usually made of materials with high damping and strong acoustic absorption characteristics; as such they have a significant influence on the overall vibro-acoustic behavior of the vehicle body.

Actran models are usually available in physical coordinates in order to simulate accurately the complex damping mechanism provided by the trim components.

Nastran is the reference tool for vibro-acoustic analysis of lightly damped structures and cavities. It features efficient modal solution sequences, making it suitable for handling large models like automotive vehicle body-in-white or aircraft fuselage.

Actran for Trimmed Body provides CAE engineers with advanced features for mixing the best of both tools: Actran physical model and Nastran modal model.

Three types of combined models may be created:

1. Actran for Trimmed Body is able to merge a set of Actran models of individual trim components with a Nastran body-in-white model in order to create a fully trimmed body vibro-acoustic model.
2. An Actran model may be set in its real-life working environment by connecting it to an existing dynamically reduced Nastran model using superelements (e.g. a detailed Actran model of a layered windshield may be connected to a Nastran model of the vehicle body).

Key features

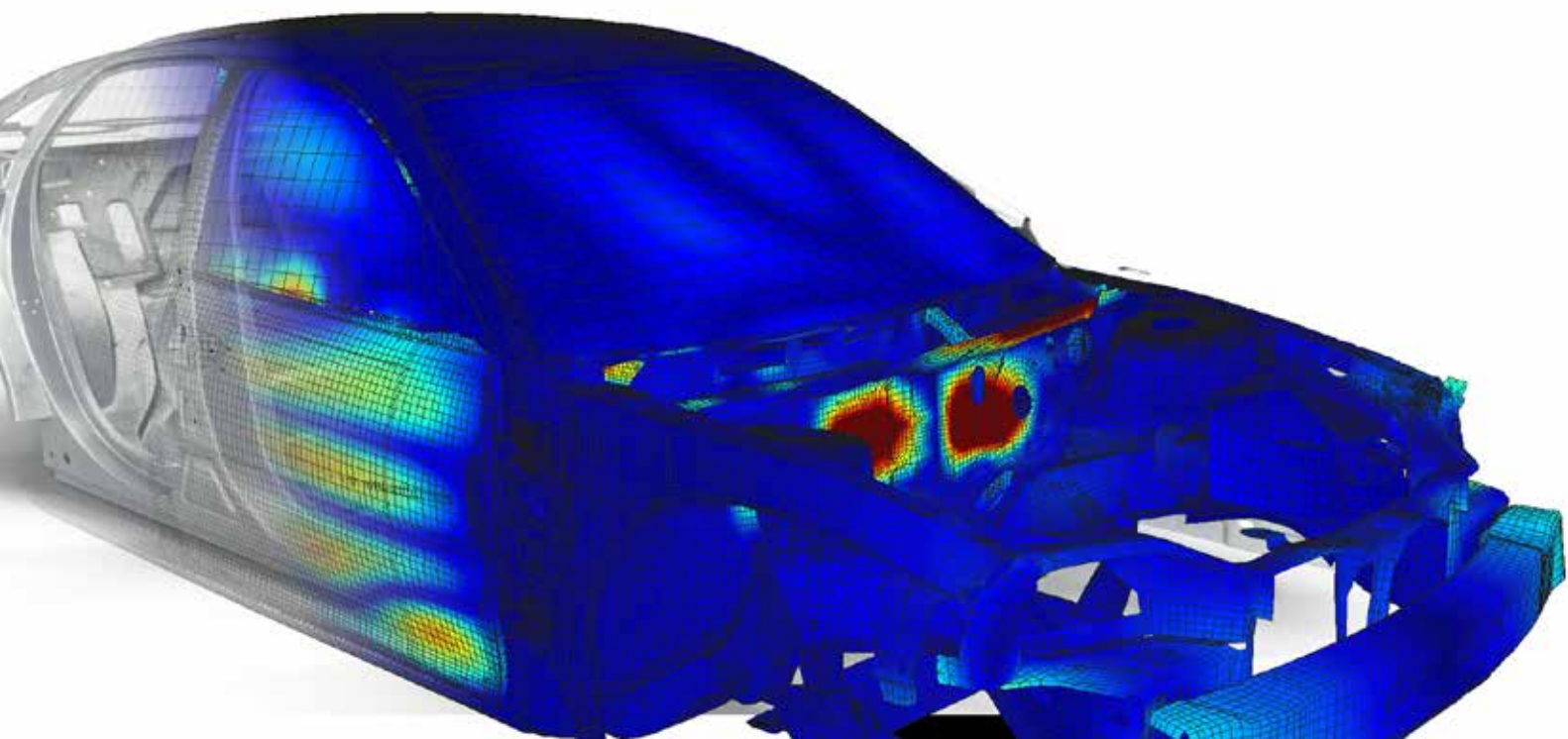
- Automatic mesh generation of 3D trim
- Analysis of fully trimmed models combining Nastran body-in-white models with Actran trim models
- Import of Nastran super-elements into Actran
- Export of Actran components to Nastran using DMIG data blocks
- Support of most Nastran brands (MSC, MD, NX, NEi)
- Available platforms: Windows 32 & 64 bits, Linux and most Unix platforms
- Integration in Actran VI

3. A Nastran model may be enriched by including a reduced Actran model of a specific component. The Actran component is defined as a DMIG data block in the Nastran deck.

Actran for Trimmed Body makes the vibro-acoustic analysis of fully trimmed bodies accurate and efficient. With the hybrid methods, the strength of modal and physical approaches are combined.

Target applications

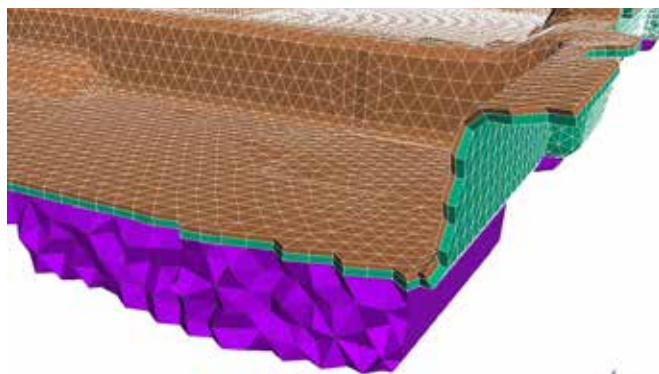
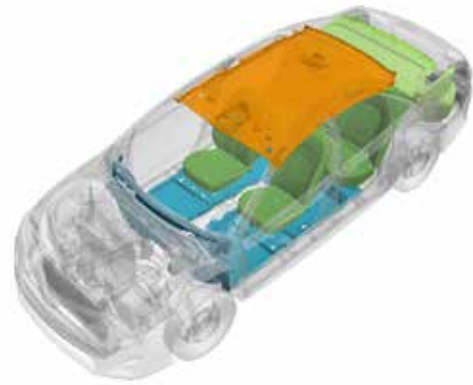
- Trimmed body NVH with accurate modeling of the trim components (headliner, dashboard, floor, etc.)
- Acoustic transmission through components in real-life mounting conditions



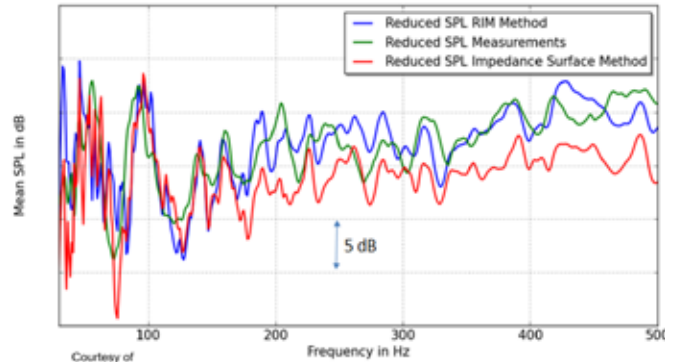


Courtesy of 

Car acoustic trim components package overview



Actran multilayered trim component



Courtesy of



Yoo, J., Brandstetter, M., Jeong, C., Jacquot, J. et al. "Extensive Correlation Study of Acoustic Trim Packages in Trimmed Body Modeling of an Automotive Vehicle," SAE Technical Paper 2019-01-1511, 2019

Full car analysis - Comparison of acoustic trim modeling approaches versus experiments. Actran for Trimmed Body approach (in blue) vs. Simplified trim modeling (in red).

Actran software suite

Actran is a complete acoustic, vibro-acoustic and aero-acoustic CAE software suite. Empowered by the technologies of finite/infinite element methods (FE/IFE), as well as the Discontinuous Galerkin Method (DGM), Actran provides a rich library of materials, elements, boundary conditions, solution schemes and solvers. Actran is a high accuracy, high performance and high productivity modeling tool suiting the needs of the most demanding engineers, researchers, teachers and students for solving the most challenging acoustic problems.

Free Field Technologies (FFT)

Free Field Technologies is focused on three main areas:

- Developing Actran software for acoustic, aero-acoustic and vibro-acoustic simulation;
- Providing technical services, support, training and delivering acoustic engineering projects;
- Researching innovative technologies and methods for efficient and accurate acoustic analysis.

Free Field Technologies is the technical leader in acoustic CAE and with a wide range of customers around the world active in the Automotive, Aerospace, Shipbuilding, Electronic and Heavy Equipment industries as well as in the Educational and Research sectors. FFT is a wholly owned subsidiary of MSC Software Corporation.





Hexagon is a global leader in sensor, software and autonomous solutions. We are putting data to work to boost efficiency, productivity, and quality across industrial, manufacturing, infrastructure, safety, and mobility applications.

Our technologies are shaping urban and production ecosystems to become increasingly connected and autonomous – ensuring a scalable, sustainable future.

Free Field Technologies (FFT), part of Hexagon's Manufacturing Intelligence division, enables manufacturers to design and optimise products with powerful acoustic, vibro-acoustic and aero-acoustic modelling software and solutions. Learn more at fft.be. Hexagon's Manufacturing Intelligence division provides solutions that utilise data from design and engineering, production and metrology to make manufacturing smarter.

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