MSC Software®

Multibody Dynamics-Acoustics Integration Solution

SOLUTION BRIEF

What is it?

Adams2Actran is an automated Interface to connect an acoustics simulation performed with Actran to the Multibody Dynamics (MBD) solution of Adams.

As a follow-up of the transient dynamics analysis performed in Adams, engineers can obtain initial results and insights of the system acoustic behavior without ever leaving the Adams interface.

With this solution, typical acoustic results can be computed with Actran, and displayed in the Adams/Postprocessor, including sound pressure levels at selected positions around the model, audible wave files for listening to the sound and color maps to visualize the sound radiation.

One of the main advantages of the interface is the simplification and automation of the iterative process that is usually needed to transfer (and convert) data between MBD and acoustic simulation. As a result, two proven solvers, Adams & Actran, are combined in a new and efficient way to increase the productivity for the daily work.
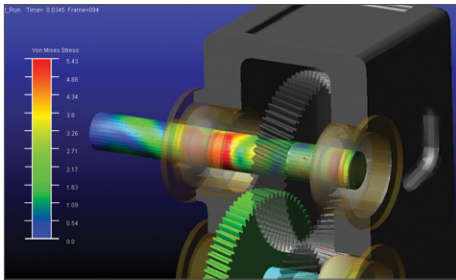
Gearbox model in Adams with flexible parts
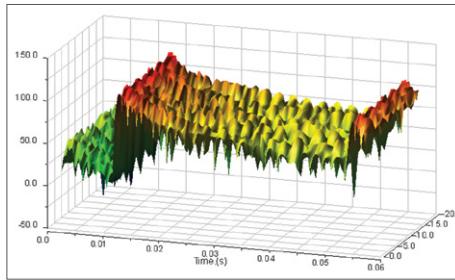
Waterfall diagram of the acoustic pressure in Adams/Postprocessor

Who is it for?

- Adams users / mechanical system engineers, who want to perform acoustic analysis in early conceptual phases
- Acoustic engineers, who want to verify the influence of varying system behavior / boundary conditions early in design
- System engineers, who perform detailed design of products to optimize both vibration and noise behavior

What is the Workflow?

Adams

As the world's most widely used Multibody Dynamics (MBD) software, Adams improves engineering efficiency and reduces product development costs by enabling early system-level design validation. Engineers can evaluate and manage the complex interactions between disciplines including motion, structures, actuation, and controls to better optimize product designs for performance, safety, and comfort. Along with extensive analysis capabilities, Adams is optimized for large-scale problems, taking advantage of high performance computing environments.
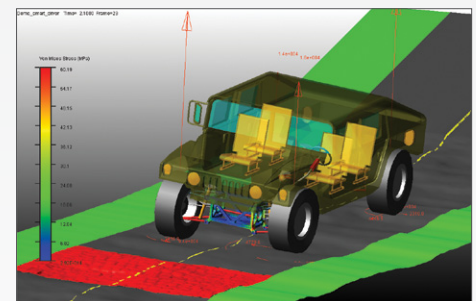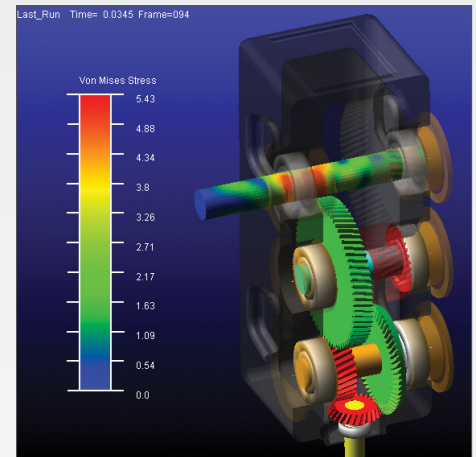
Actran

Actran is the premier acoustics software to solve acoustics, vibro-acoustics, and aero-acoustics problems. 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. With the high performance solution coupled with easy to use modeling environment, engineers can gain insight into the acoustic behavior of their products and improve designs..
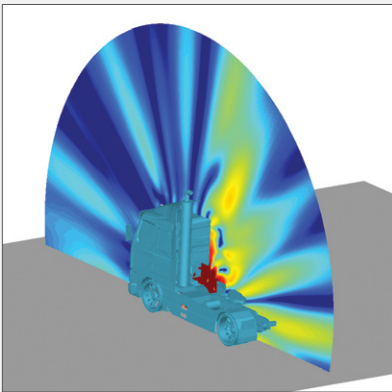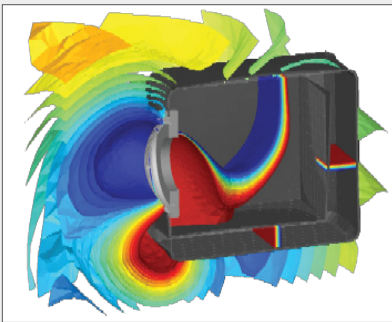
About MSC Software

MSC Software is one of the ten original software companies and a global leader in helping product manufacturers to advance their engineering methods with simulation software and services.

www.mscsoftware.com

What is the Challenge?

Multibody dynamics and structural dynamics are strongly coupled, taking into account mass, inertia, contacts and flexible structures. But acoustic radiation is usually handled by a weak coupling that requires new models and conversion of data. Connecting the two worlds on a daily basis may lead to loss of information and requires additional manual work. Mechanical analysts who design the products are rarely acoustic specialists.

How can we help you?

Engineering Expertise You Can Trust

Getting started is easy.

Our extremely skilled engineers are experts at utilizing Computer Aided Engineering (CAE) for analyzing fatigue behavior. Our team is highly efficient in applying Adams, MSC Nastran and Actran for solving almost any type of NVH challenges.

By combining MBD and acoustics in a single environment, an efficient solution is created from a user point of view. This includes automated modeling of the acoustic model, acoustic computation and post-processing. Mechanical engineers can get an insight of the acoustic behavior of the designed products with minimum effort.
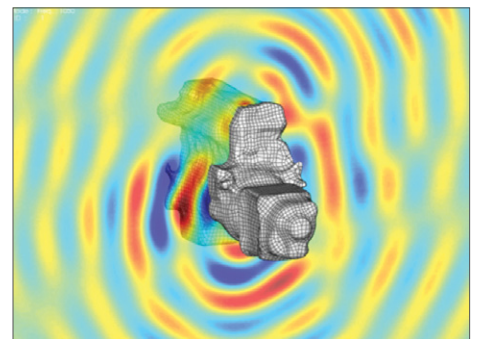
Flexible Services Offerings

We provide consulting support based on your specific requirements. This could range from performing analysis for you on a project basis to providing full time staff members to help you create repeatable processes in-house.

MSC's services team can help your company in a variety of ways:

- Quick Start Project
- Knowledge Transfer
- Mentoring
- Staff Augmentation
- On-site Support
- Methods Development
- Training
- Hotline Support

What are the benefits?

- One model, one environment - two different simulation disciplines
- The Actran analysis will be created and launched automatically with default values
- No need for Actran graphical interface for modeling
- Integrated process chain, manual interaction is not required
- Consolidation of the process stream, reduced throughput times increase productivity
- Reduced error rates due to avoidance of manual data transfer and conversion

Powertrain noise radiation