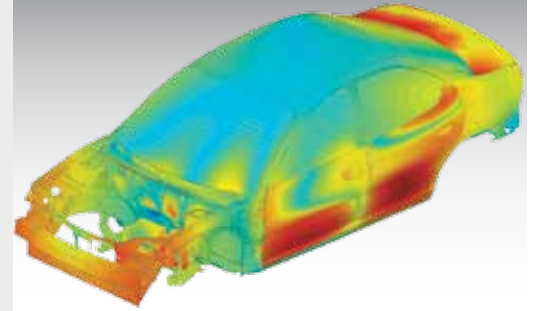


# Simulation Services for Acoustics Engineering

## Global Engineering Services



### Industry Experience

Our team of engineers and scientists have a expertise in acoustic simulation across a wide range of engineering disciplines and industries. You can rely on us to get the job done right.

### Engineering Expertise You Can Trust

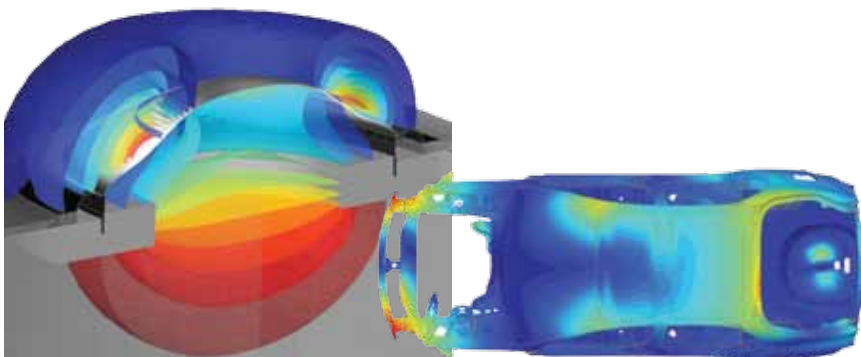
Our extremely skilled engineers are experts at utilizing Computer Aided Engineering (CAE) for analyzing acoustic behavior. Our team is highly efficient in applying the Actran™ family of software for solving almost any type of acoustic challenge - starting from the CAD model through the mesh generation up to the post- processing and analysis of results.

### Flexible Services Offerings

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

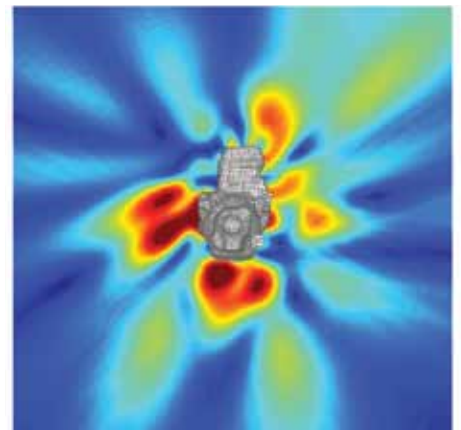
MSC's acoustic services team can help your company in a variety of ways:

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



### Free Field Technologies:

Free Field Technologies (FFT) is a wholly owned subsidiary of MSC Software Corporation that has more than 300 customers around the world active in the Automotive, Aerospace, Electronic and Heavy Equipment industries as well as in the Educational and Research sectors.



## Areas of Expertise

- Sound radiation by vibrating structures: powertrain, engine components, compressors, electrical motors, loudspeakers and more.
- Intake and exhaust noise, including complex mufflers and silencers.
- Calculation of transfer matrices coefficients for air conditioning units and distribution systems.
- Sound absorption inside passenger compartment of cars, trains and aircrafts.
- Sound propagation in complex media with mean flow or temperature gradient.
- Audio devices such as telephones, hearing aids or musical instruments.

## Sample Projects

### • Acoustic Radiation of a Vibrating Structure

Analysis of noise radiated by structures that vibrate in an open environment such as an engine, gearbox or turbo compressor.

### • Acoustic and Vibro-Acoustic Performance of Ducted Systems

Assessing the acoustic and vibro-acoustics performance of an exhaust (or intake) line by computing the pipe and shell noises accounting for porous materials (rockwool, glasswool), porous plates and temperature gradients.

### • Aero-Acoustic Analysis in Vehicle Interiors

Predicting the aero-acoustic noise generated by automotive climate control systems to reduce noise in a vehicle interior. Actran's unique aero-acoustic features are used to compute the acoustic source terms from unsteady CFD results and propagate them in the environment.

### • Aero-Vibro-Acoustic Analysis

Computing the interior noise levels generated by turbulent air flow created by external fixture such as side mirrors.

### • Acoustic Transparency of Flexible Panels

Evaluating the acoustic transmission through flexible structural components like floor panels, dash boards, door panels and windshields.

### • Noise Transmission due to Turbulent Boundary Layer (TBL)

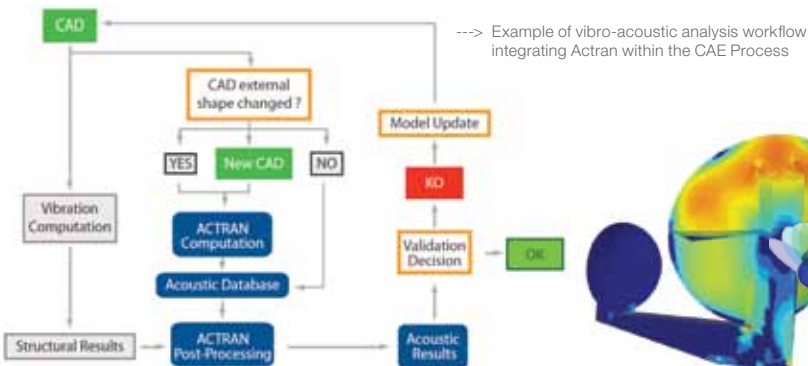
Study of the performance of acoustic insulation in an aircraft fuselage panel subjected to a TBL during flight.

### • Environmental Control Systems (ECS) Noise

Understanding the effect of duct shapes, materials and acoustic treatments on noise propagation through ECS ducts.

## Actran Software Suite

Actran is a high performance, high productivity, high accuracy modeling environment suiting the needs of the most demanding engineers, researchers and teachers and empowering them with the tool they need for solving the most challenging acoustic problems.



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