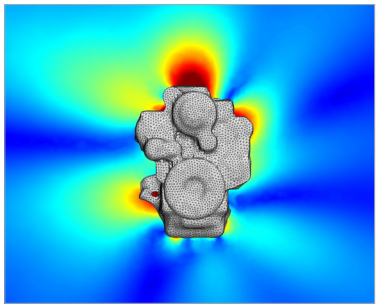
Actran™

Powerful Acoustic Simulation Software

FFT
MSC Software Company

The Actran software suite is intensively used by leading companies in automotive, aerospace, consumer electronics, and other industries to improve the acoustic performance of their products. Actran offers general purpose acoustic, vibro-acoustic and aero-acoustic capabilities. Thanks to its extensive modeling capabilities, intuitive graphical user interface, and powerful solver implementation, Actran is the ideal companion for engineers who need to simulate advanced acoustic problems easily, efficiently, and accurately.

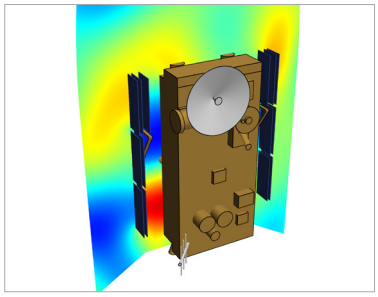


Actran Acoustics

Your solution for interior and exterior acoustic propagation, weakly coupled vibro-acoustics, and duct acoustics

Actran Acoustics is the core module of Actran. It contains a wide range of modeling features, allowing to predict interior and exterior noise propagation problems. Actran Acoustics can account for complex effects such as flow and temperature effects, absorbing materials, visco-thermal losses, and more. Actran includes time domain and frequency domain solvers and interfaces with structural FEA (such as MSC Nastran™) and MBD (Adams™) solvers to compute the acoustic radiation from vibrating structures.

Examples of application: Acoustic radiation of vibrating structures such as internal combustion or electric engines, gearbox and compressors; Duct acoustics (mufflers, silencers, air conditioning units, distribution systems); Pass-by Noise

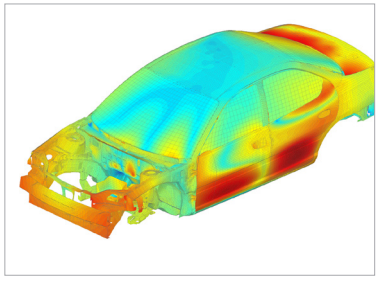


Actran Vibro-Acoustics

Your solution for strongly coupled vibro-acoustics

Actran Vibro-acoustics is an add-on module that extends the features of Actran Acoustics with capabilities to solve structure dynamics and the interactions between a structure and an acoustic fluid. Structures are modeled directly in Actran or represented by their modes computed by an external FEA solver. In addition, complex absorbing materials such as foams can be introduced in the model. Structures can be loaded with excitations representing the most realistic conditions: from simple loadings to diffuse sound field or turbulent boundary layer stochastic excitations.

Examples of application: Sound transmission through panels (windows, sealing, cockpits, fuselage); Acoustic fatigue of spacecraft structures; Vibro-acoustic strong interactions (loudspeaker, submerged structures, piezo-electric actuators)

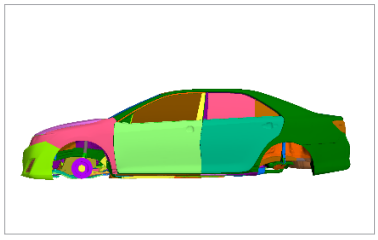


Actran for Trimmed Body

Your solution for NVH of trimmed vehicle bodies

Actran for Trimmed Body is a powerful tool to model and analyze the effect of acoustic trim components on complex structures. Structure models computed by FEA solvers such as MSC Nastran™ are complemented by a detailed model of acoustic trim components to account for structural damping, insulation, and acoustic absorption. Actran for Trimmed Body allows users to accurately predict the noise perceived by passengers from any kind of vibration (e.g. engine or suspension mounts) or noise source (e.g. wind noise, exhaust or engine air-borne propagation).

Examples of application: NVH analysis of car trimmed body; In-flight passenger comfort; Truck Cabin noise

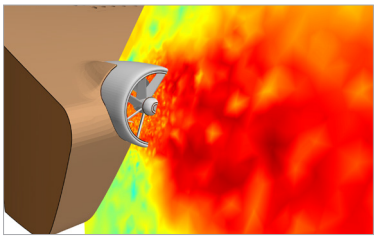


Actran SEA

Your solution to extend your vibro-acoustic analysis range

The Actran SEA module offers the possibility to extend the usability of existing vibro-acoustic finite elements models to mid- and high- frequencies. Based on automatic or user-defined subsystems definition, the SEA parameters are efficiently extracted from the Finite Elements model. Even without SEA expertise, sound and vibration analysis at mid and high frequencies can be performed, along with energy transfer path analysis.

Example of application: Boat noise onboard prediction, vehicle transfer path analysis, interior acoustic comfort

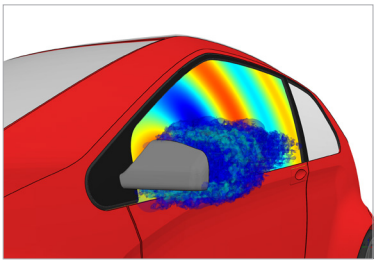


Actran Aero-Acoustics

Your solution for predicting flow-induced noise

Actran Aero-Acoustics is a module featuring advanced capabilities to accurately predict noises generated by turbulent flows. Based on unsteady CFD flow simulation results, Actran Aero-Acoustics computes the equivalent noise sources and their acoustic propagation. Actran can interface with MSC SC/Tetra™, ANSYS Fluent™ and CFX™ , StarCCM+™ , Powerflow™ , OpenFOAM™ and others.

Example of application: Flow noise in air conditioning or exhaust systems; Side mirror noise; Noise generated by rotating axial or centrifugal fans; Airframe Noise (landing gear, trailing edge)

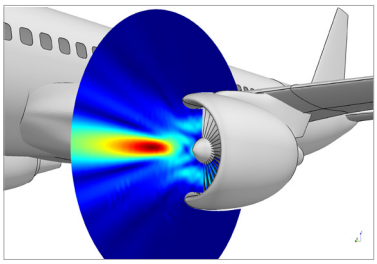


Actran SNGR

Your solution for fast flow noise computation

Actran SNGR features innovative capabilities to predict the noise generated by turbulent flows in a much faster way than with classical aero-acoustic approaches. It uses RANS CFD analysis results to synthesize the aero-acoustic noise sources which allow a drastic reduction of the complete calculation process. Actran SNGR is particularly useful when relative levels between different designs are needed such as in an optimization process.

Example of application: Flow noise in air conditioning or exhaust systems; Side mirror noise; Noise generated by rotating axial or centrifugal fans; Airframe Noise (landing gear, trailing edge); Wind noise around complete car body

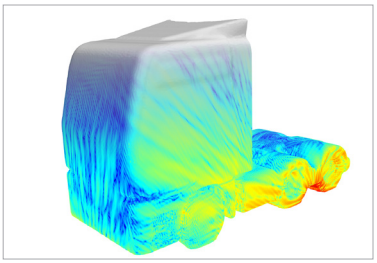


Actran TM

Your solution for turbomachinery noise

Actran TM is the aeronautic industry standard to analyze the sound radiated by turbomachinery and optimize the related acoustic treatments. One of the challenges of acoustic CAE methods is handling large models associated with high wave numbers and large geometrical sizes and complexities. Actran TM provides efficient solver technologies and advanced parallel processing to address this challenge. Actran TM can be complemented by Actran DGM to solve problems involving complex shear layers and flow gradients occurring at the engine exhaust.

Example of application: Optimization of acoustic treatments for aircraft turbofan engine inlets or helicopter turbines; High frequency propagation in duct systems (ducted cooling systems, car exhaust)

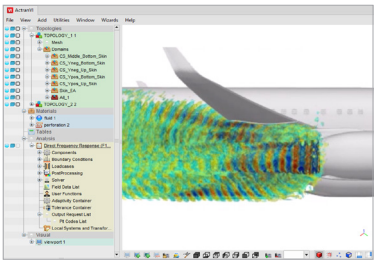


Actran DGM

Your solution for acoustic radiation in large domains, complex flows, and high frequencies

Actran DGM solves the linearized Euler equations in time domain with Discontinuous Galerkin Method. This grants Actran DGM the unique capability to solve acoustic propagation in complex flows such as high temperature gradients, shear layers, or supersonic flows. With its adaptive high order elements, remarkable scalability, and GPU acceleration capabilities, Actran DGM is particularly well suited for studying acoustic radiation from large structures or at high frequencies.

Example of application: Noise propagation at exhaust of turbomachines; Ultrasonic sensors; Noise radiation from large structures (complete vehicle bodies, wind turbines)



Actran VI

Dedicated pre & post-processing for the Actran suite

The Actran software suite is supported by an intuitive Graphical User Interface (GUI) dedicated to Actran model pre- and post-processing. Actran VI features its own meshing tools specifically designed for generating, modifying, and improving meshes for vibro- and aero-acoustic analyses starting from any existing CAD or mesh file. Actran VI also includes pre-processing tools to ease the creation and edition of any Actran model. A large variety of post-processing tools such as plots, maps, animations, and waterfall diagrams are also available to help users extract the most information out of each calculation. The Actran GUI and solver are thoroughly supported by Python API and sessions files, which make automation or optimization accessible to any user.

Take the acoustic performance of your products to the next level with a complete simulation solution used by leading companies around the world!

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