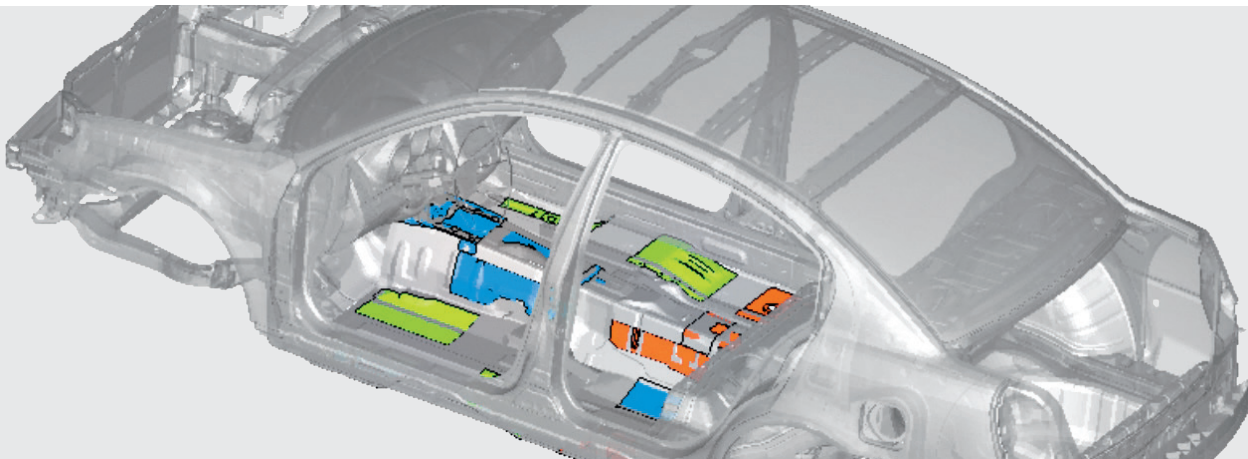


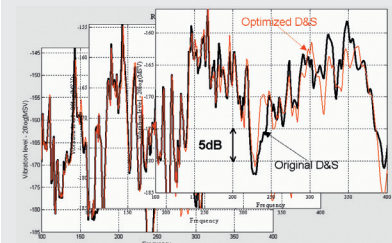
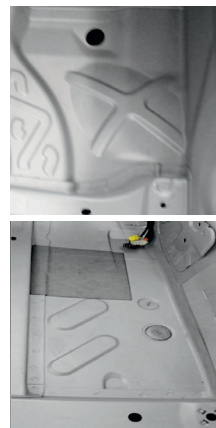
# GOLD – Genetic Algorithms Optimization of Body Mid-Frequency Vibration



GOLD is a unique simulation tool for the simultaneous optimization of a damping package and vehicle body panel shape.

It exploits the Finite Elements (FE) analysis performed with NASTRAN (Superelement Technique for full body optimization) and uses an Autoneum modeling technique to simulate the application of damping material on vehicle body panels.

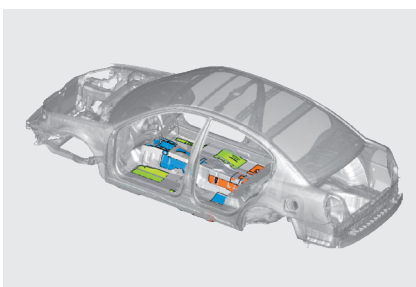
GOLD automatically updates the FE model with possible shape modifications as set by the user: beadings, ribs and soapfilms. Thanks to the Genetic Algorithm core it can handle a very high number of design variables.



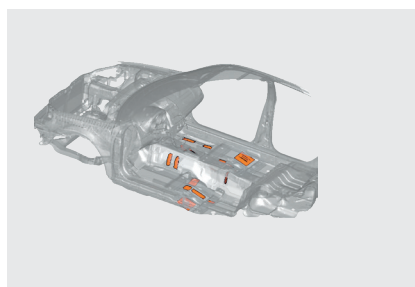
Optimization CPU time: In 4 days, 900 solutions explored, 20% damping weight reduction.

**Example:**

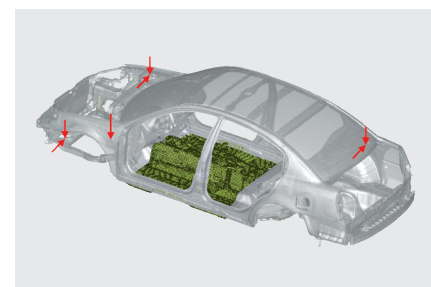
Reduction of damping package weight by 20% in floor area. Same or better performance as original (same panel vibration).



11 design variables for the position and the thickness of damping patches.



27 design variables for the shape modifications on the panels: 20 beadings, 7 soap films.



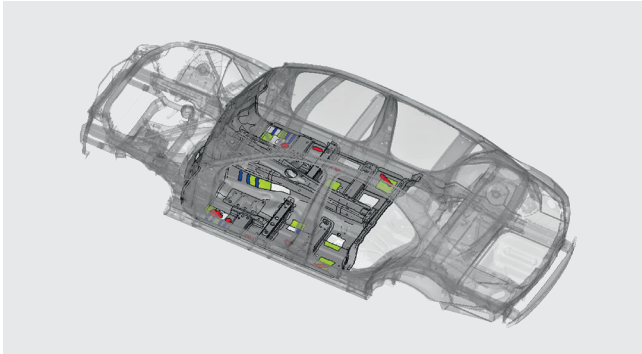
Full vehicle simulation: 7 uncorrelated loading conditions.

Autoneum. Mastering sound and heat.

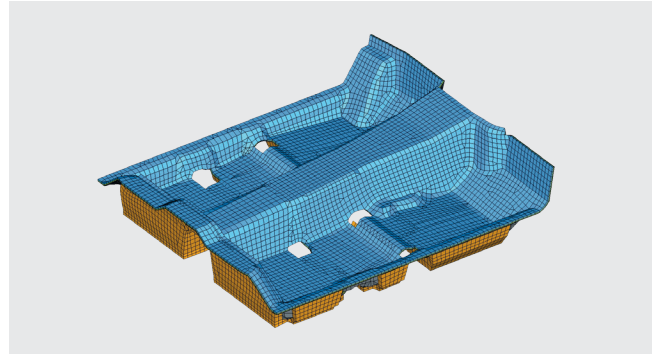
## Autoneum's solution for the optimization of vehicle body structure and acoustic trim

Autoneum has developed a complete tool portfolio that addresses the state of the art in the field of CAE for vibro-acoustics, focusing on body vibration and acoustic trim

performance. Our tools predict and optimize NVH in the concept phase to provide our customers with cost effective solutions and reduced lead times.

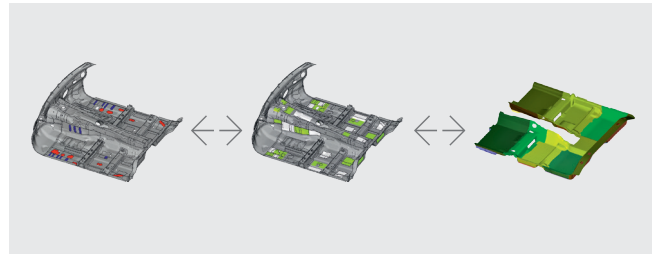


**GOLD** is a unique simulation tool for the simultaneous optimization of the damping package and vehicle body panel shape. It is based on a standard MSC NASTRAN solution.

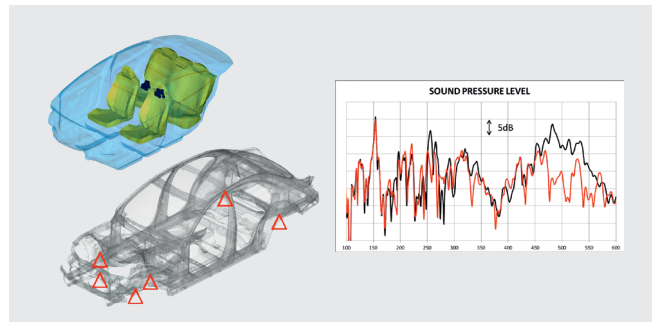


**TREASURI2** allows the Finite Elements (FE) simulation of acoustic trim components containing porous materials, thanks to its full integration into MSC NASTRAN.

As an extension of GOLD and TREASURI2, the new simulation concept **GOLDTrim** features not only the optimization of the damping package (damper pads location, weight, size and material) together with appropriate body panel shapes, but also the optimization of the sound package for dash insulators or carpet insulation systems.



The acoustic trim, the damping package and the body panel shape can be optimized with respect to interior SPL improvement and weight reduction.



Interior SPL improvement up to 600 Hz with sound package weight reduction under structure-borne excitation.

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