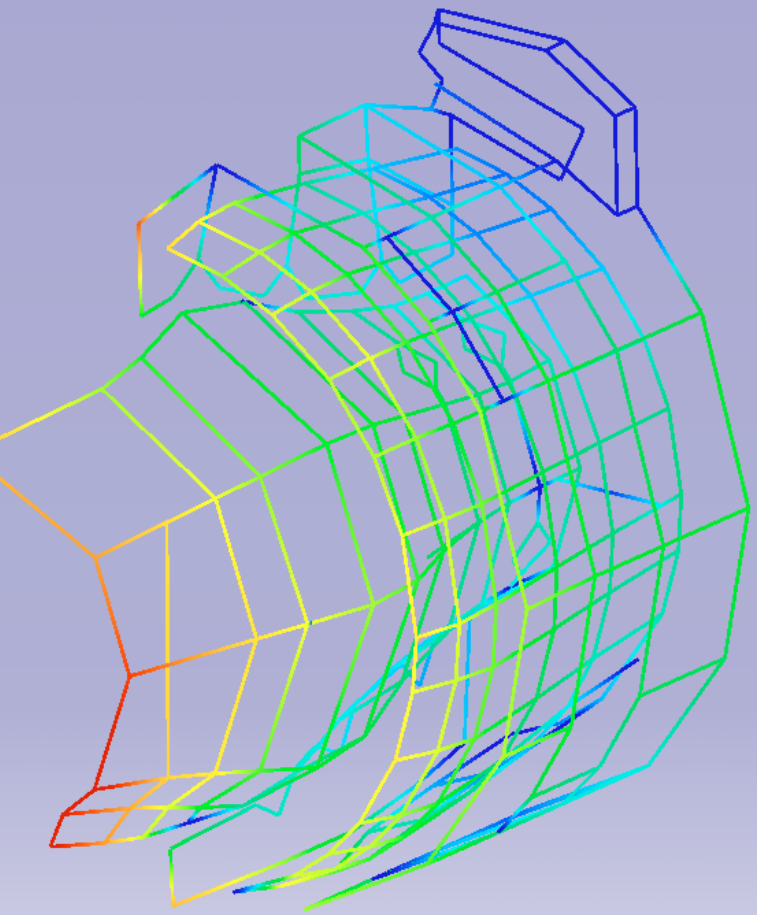
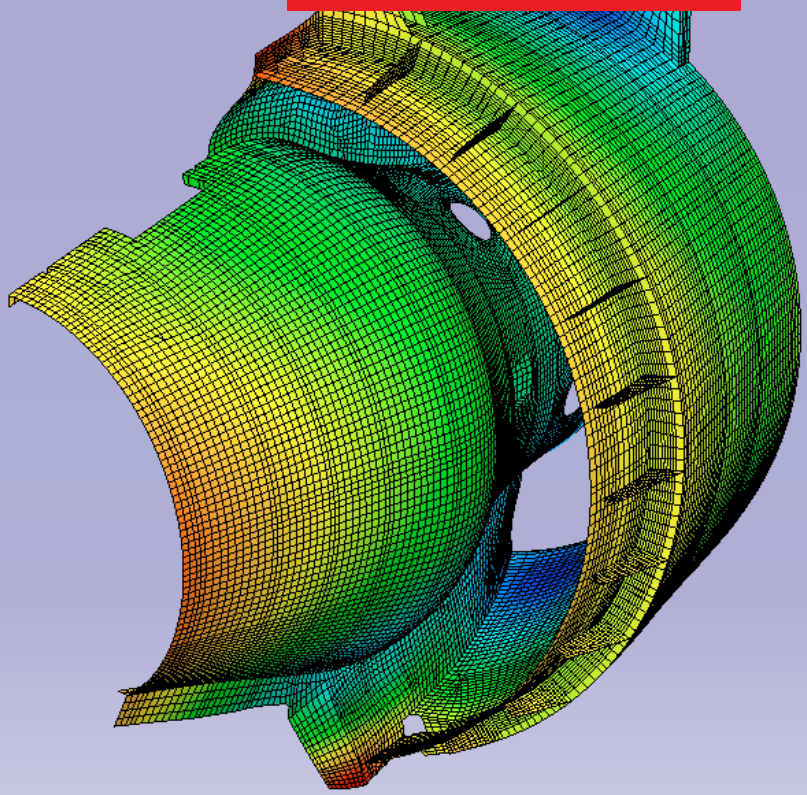
Leading partner in
Test & **Mechatronic Simulation**





LMS Virtual.Lab Noise & Vibration and Correlation

Predict noise and vibration and perform systematic validation

LMS Virtual.Lab Noise & Vibration helps to analyze, refine and optimize the noise and vibration of a system under development, from the component- up to the system-level. LMS Virtual.Lab Correlation allows engineers to validate and further improve simulation models.

LMS Virtual.Lab combines all the necessary tools to create system-level hybrid (combining FE and Test) models, build realistic load cases and simulate noise and vibration responses. It includes a wide range of visualization and analysis tools to explore noise and vibration performance and accurately pinpoint the most critical contributors. User-friendly tools enable engineers to quickly perform design modifications and assess the effect on the noise and vibration performance in minutes.

LMS Virtual.Lab Noise & Vibration and Correlation offers direct access to standard FE and test data including a unique export to LMS Test.Lab. It allows to quickly compare and validate FE models to test data and identify possible modeling errors to systematically improve existing simulation models.

- → Cascade system targets down to component targets
- → Integrate test information in simulation models for more efficient and accurate predictions
- → Analyze critical noise and vibration contributors and identify optimal design modifications
- → Refine noise and vibration performance before building the first prototype efficiently
- → Compare and validate FE models based on test data

Making virtual simulation realistic
www.realworldready.com

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LMS Virtual.Lab Noise & Vibration and Correlation - Rev 11

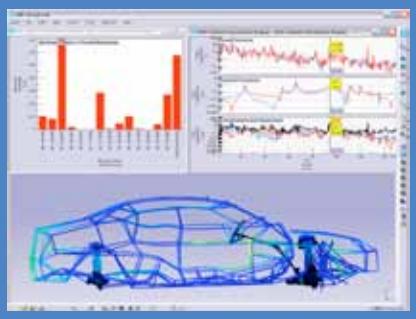
Always innovative

Premium NVH structural FEM solver

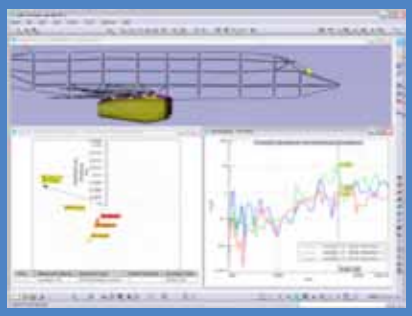
A comprehensive FEM solver included in the NVH product portfolio supports the NVH hybrid engineering process. Test components (e.g. from LMS Test.Lab) can be coupled to FE-based components, calculated through the newly integrated NVH FEM solver. The element library supported in this solver is comprehensive, including 1D, 2D and 3D elements made of isotropic, orthotropic, anisotropic, layered and composite materials.

Kinematic connectors in system-level NVH

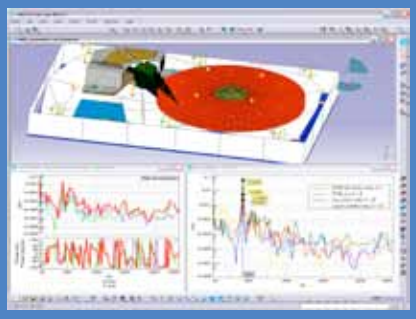
The NVH modules allow coupling of the dynamics of individual components represented by modes or transfer functions or by FE or test. The coupling properties between these components are now extended to include kinematic connectors, beyond the existing flexible and rigid connectors. As such, system-level transfer functions or system-level modes can be calculated efficiently through the integrated FBS or modal coupling solver, where the subsystems are coupled by kinematic connectors.



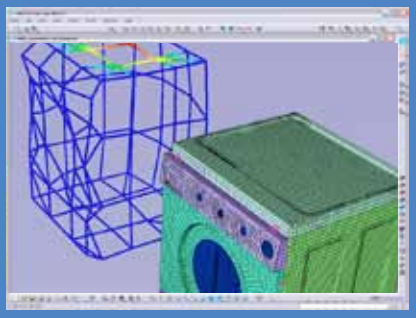
Full vehicle NVH performance assessment



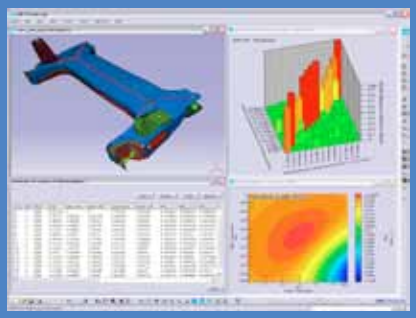
Engine unbalance related noise prediction



Transfer Path Analysis of a hard drive system



Finite Element models validation



Integrated sensitivity and updating functionality

Other highlights

- Assess full vehicle NVH performance for road noise or engine noise-based on efficient system-level NVH solvers (FRF-based or modal-based).
- Efficiently apply the loading adapted to the situation including full engine run-up or road load inputs.
- Get responses fast for full operating conditions using the integrated vibration response solvers (FRF-based or modal-based).
- Perform detailed contribution analysis to pinpoint the cause of NVH problems.
- Analyze the effect of design modifications on the NVH performance within minutes using the Fast Modification Prediction Tools.
- Optimize the NVH performance of assembled systems using the integrated DOE and optimization tools, e.g. in support of mount optimization, component optimization and more.

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