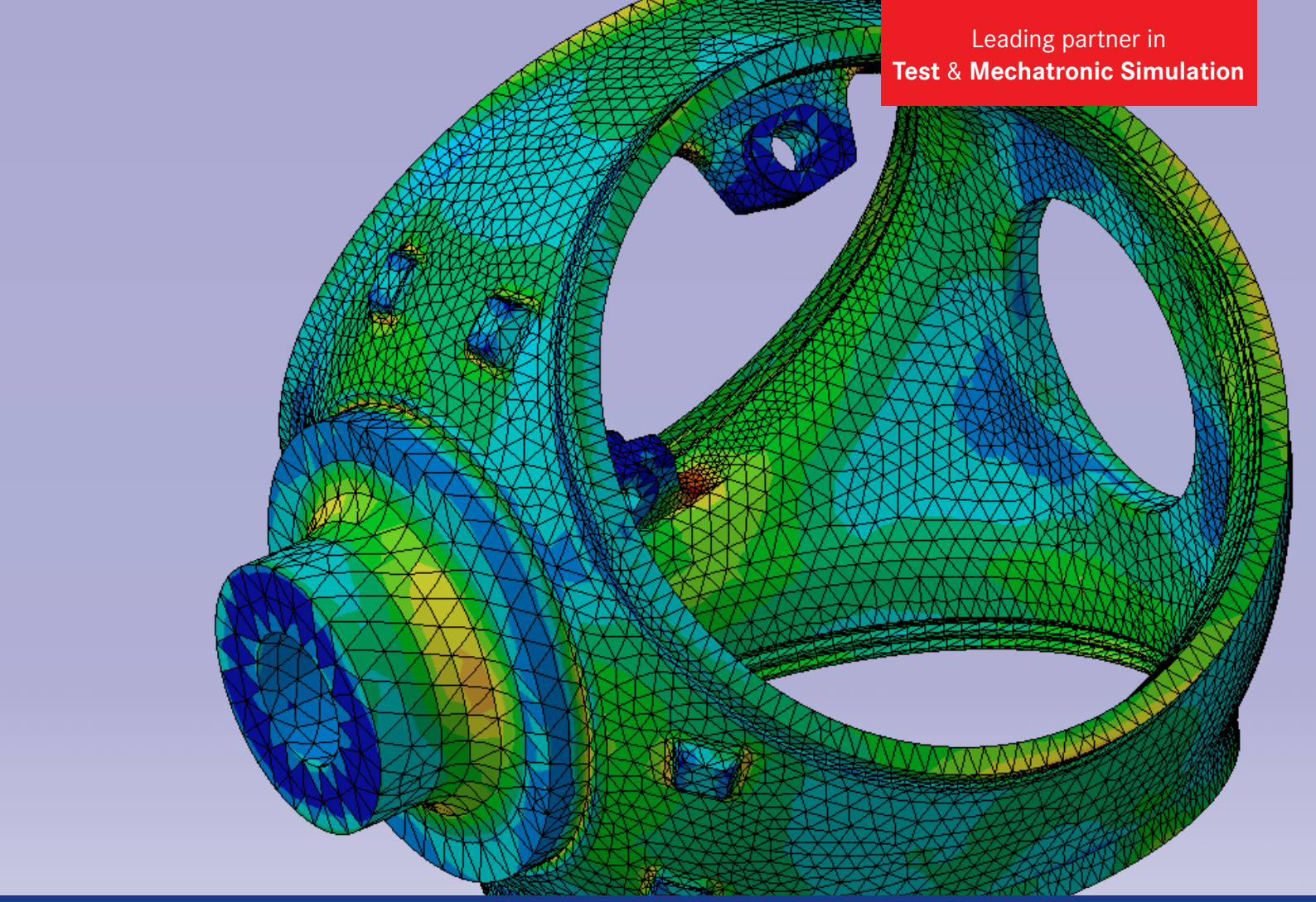
Leading partner in
Test & **Mechatronic Simulation**



LMS Virtual.Lab Durability

Design for optimal durability performance

LMS Virtual.Lab Durability offers an integrated solution in designing light weight, reliable and fatigue resistant products right from the start. It predicts fatigue hotspots on the component and the full system. This feature proves to be of great value for making the right design decisions early in the development process.

LMS Virtual.Lab Durability provides direct feedback on critical fatigue areas and the root cause of fatigue issues. This immediate insight enables engineering teams to validate more design variants in relation to fatigue life within ever-shorter development cycles.

LMS Virtual.Lab Durability offers the most complete and accurate methodologies to assess seam weld fatigue and spot weld fatigue. An analysis of lightweight materials like composites is also possible, taking into account the influence of the production process. In addition, the user can incorporate factors such as temperature and creeping. The analysis can be seamlessly integrated into load prediction and test rig simulation with LMS Virtual.Lab Motion. This allows the simulation and improvement of complex multi-axial fatigue tests as well as shaker table validations.

- → Validate more design variants for fatigue life within ever-shorter development cycles
- → Improve the fatigue behavior of welded structures
- → Optimize durability performance with lightweight and eco-friendly materials
- → Understand better and improve fatigue testing

Making virtual simulation realistic
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LMS Virtual.Lab Durability - Rev 11

Always innovative

Ensure reliable connections: more accurate and faster simulation of seam welds

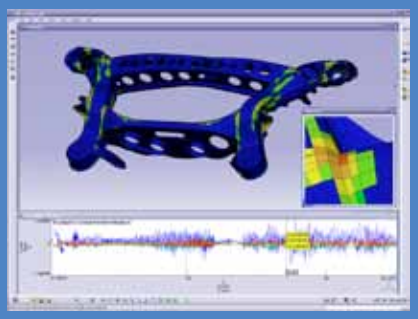
LMS Virtual.Lab Durability provides an enhanced tool to automatically identify all typical seam weld topologies in an FE-mesh. It eliminates the need for engineers to tediously model each seam weld connection manually and it offers significant speedups for large welded assemblies.

All commonly accepted methodologies from structural stress to notch stress methods can directly be applied to the welds detected without modifying the FE-meshing. Size effects in the notches can be accounted for by the new effective stress concept. This widens the applicability from very thin (<1mm) to very thick (>100mm) sheets.

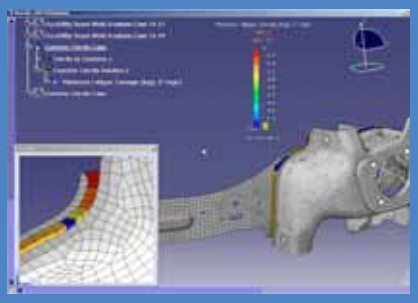
The extension of the shell element seam weld techniques to solid element meshes enables the user to analyze the notch stresses without modeling the notches in the finite element mesh. This makes accurate weld fatigue analysis much more accessible to engineers in different industries.

Lighter but durable design: fatigue for short fiber composites

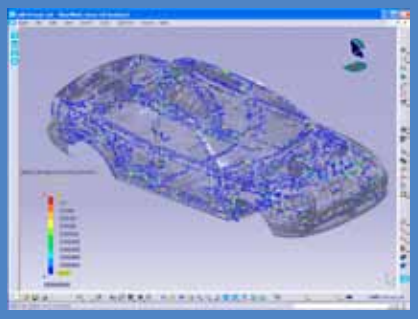
The accurate simulation of short fiber composite structures is possible through the interfacing of LMS Virtual.Lab fatigue methods and e-Xstream DIGIMAT™, a software solution that allows the modeling of short fiber composites amongst others.



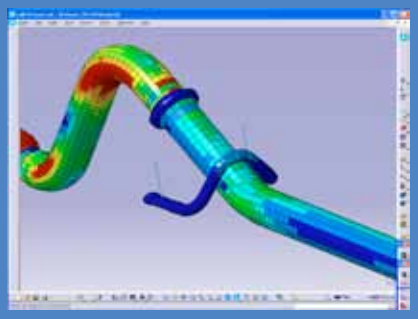
Reliable solver for durability simulation



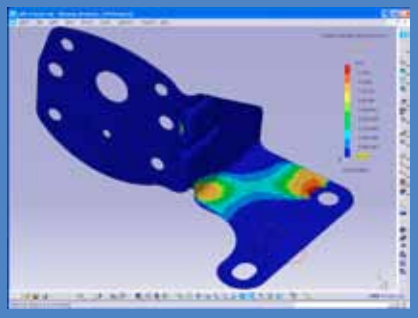
Accurate fatigue life prediction of seam welds



Accurate fatigue life prediction of spot welds



Effect of high temperature changes



Shaker table test simulation with vibration fatigue

Other highlights

- Take into account mean stress influence by the interpolation of several SN-curves.
- Complete application for certification easily by allowing multiple loads events of a fatigue test schedule to run concurrently.
- Support ABAQUS Fasteners spot weld mesh.
- Include creeping and thermal fatigue in a fast and accurate manner.

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