L&L Products Europe

e-Xstream ENGINEERING
MSC Software Company

Impact on a stiffener for lower B-pillar

CUSTOMER: L&L Products

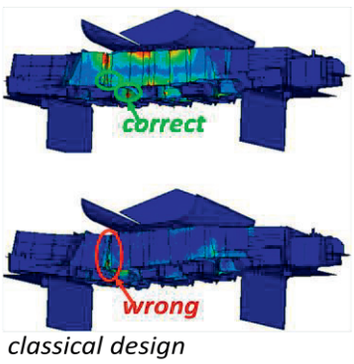
- Provider of individual and innovative engineering solutions to the automotive industry
- Known for superior engineering through the use of state-of-the-art simulation methods in the product development chain

CHALLENGE

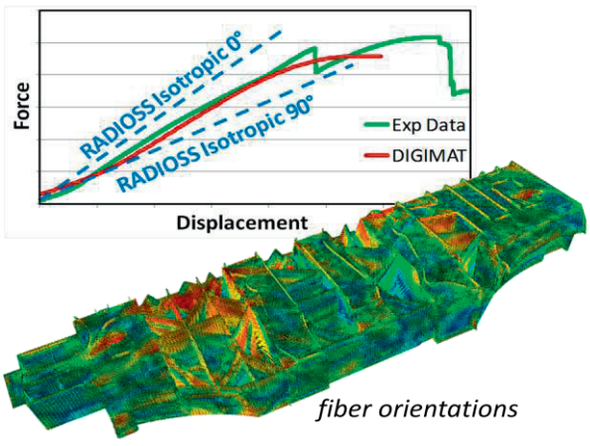
- To move towards greener technology by replacing classical metal design by composite structures
- To use the outstanding performance of composite materials whilst tackling all additional difficulties arising from the injection molding process
- High quality prediction of impact on a short fiber reinforced stiffener beam

WHAT IS THE DIGIMAT ADVANTAGE IN FUTURE CAE?

DIGIMAT



classical design



fiber orientations

DIGIMAT SOLUTION

- Strain rate dependent micromechanical material model for AKULON K224 HG7 supplied by DSM
- Mapping of MOLDFLOW fiber orientations onto the structural mesh
- Solution of a nonlinear multi-scale analysis with DIGIMAT coupled to RADIOSS

RESULTS

- Excellent correlation on the force-displacement curve with experiment
- Excellent correlation on the failure location compared to experiment
- Drastic improvement of predictivity enables robust and lightweight design focusing on cost efficiency based on advanced DIGIMAT CAE technology

MATERIALS
Reinforced Plastics

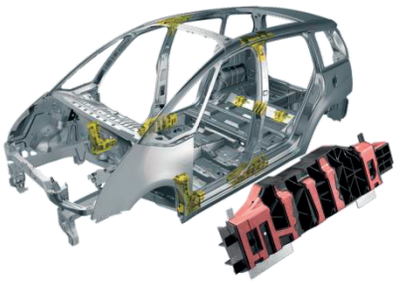
PERFORMANCES
Stiffness, Failure

DIGIMAT
Digimat-MF, Digimat-CAE, Digimat-MX, Digimat-MAP

CAE TECHNOLOGY
Radioss, Moldflow

INDUSTRY
Automotive

APPLICATION
Crash



Courtesy of L&L Products

"The key advantage provided by DIGIMAT coupled to Radioss and other CAE software is a drastic predictivity improvement for glass filled polyamide materials. With an improved predictivity, optimal and robust lightweight design is possible in the future."

F. Braymand, Simulation Manager at L&L Products

Digimat

The nonlinear multi-scale material & structure modeling platform

Digimat material modeling platform means developing innovative, optimized and cost-effective products. As a unique nonlinear multi-scale material and structure modeling platform, Digimat offers:

Digimat MF: Mean-Field homogenization software used to predict the nonlinear behavior of multi-phase materials.

Digimat FE: Finite Element based homogenization software used to model the nonlinear behavior of Representative Volume Elements (RVE) of material microstructures.

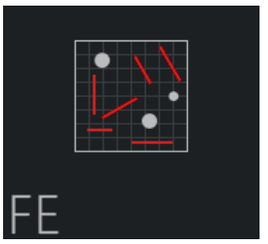
Digimat MX: Material eXchange platform used to prepare, store, retrieve and securely exchange Digimat material models between material suppliers and end-users**.**

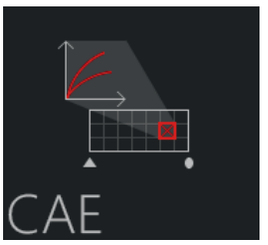
Digimat CAE: Digimat linear and nonlinear interfaces to major processing and structural FEA software to enable multi-scale analyses of composite structures.

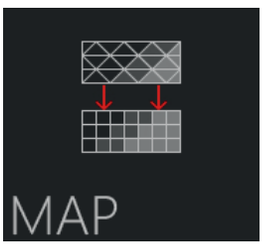
Digimat MAP: Shell & 3D mapping software used to transfer fiber orientation, residual stresses and temperatures between dissimilar processing and structural meshes.

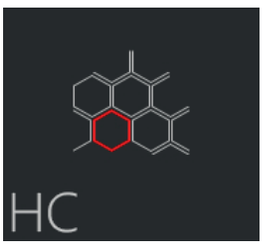
Digimat RP: Easy and efficient solution for the design of fiber reinforced plastic parts.

Digimat HC: Easy and efficient solution for the design of honeycomb sandwich panels.









e-Xstream ENGINEERING

MSC Software Company

The material modeling company

e-Xstream engineering is a provider of simulation software & engineering services, 100% focused on advanced material modeling. e-Xstream was founded in 2003 in Belgium and Luxembourg. e-Xstream is an MSC Software company since September 2012 with more than 1100 associates working from over 20 offices around the world.

e-Xstream engineering develops and commercializes Digimat – the nonlinear multi-scale material and structure modeling platform that fastens the development of optimal composite materials and parts.

Digimat customers are material experts and structural engineers who accurately predict the behavior of multi-phase composite materials and structures. Digimat is used by all major material suppliers and users across all industries (Automotive, Aerospace, Electric & Electronics, Leisure, Defense ...).

With this important customer base worldwide, e-Xstream combines deep expertise in material modeling and numerical simulations with the business understanding of the large variety of materials used across all industries.

www.e-Xstream.com