DYNA **MORE**

I herewith register for the following event:

Seminar: Modelling of Polymers and Elastomers
4 - 5 November 2013, Stuttgart, Germany
  Industry: 1,100 €   University: 550 €

Information day: Composite Analysis
6 November 2013, Stuttgart, Germany
Free of charge

Seminar: Introduction to Composite Modeling
7 - 8 November 2013, Stuttgart, Germany
  Industry: 950 €   University: 475 €

Students free of charge, provided there are vacancies.

Sender

First name: _____

Last name: _____

Company: _____

Dept.: _____

Street: _____

ZIP-code city: _____

Tel.: _____

Fax: _____

E-Mail: _____

Date, signature: _____

Please complete and fax or send to DYNAmore GmbH,
Industriestr. 2, D-70565 Stuttgart, Germany
Fax: +49 (0)711-459600-29, seminar@dynamore.de

All prices are subject to VAT, if applicable.

LS-DYNA

LS-DYNA is a highly-advanced general-purpose finite-element program that is capable of simulating complex real world problems far beyond the code's origins in nonlinear, transient dynamic finite-element analysis using explicit time integration. Thus, it is not only used by the automotive industry but is also highly appreciated in the aerospace, construction, military, manufacturing, and bioengineering industries and research institutes. The shared and distributed memory solver provides very short turnaround times on desktop computers as well as on various cluster and HPC systems.

With LS-DYNA, the Livermore Software Technology Corporation (LSTC) provides a fully loaded tool box with efficient spatial and temporal discretization methods, which enable the seamless solution of coupled problems requiring

  "multi-physics",   "multi-processing",
  "multiple stages",   "multi-scale".

This includes the class of volume- and surface-coupled problems and refers to the coupling possibilities of the structural solver with the solvers for incompressible and compressible fluids, temperature and electromagnetism. Herein, LS-DYNA allows to switch between or even combine explicit and implicit times stepping schemes. The spatial discretization can be carried out using FEM, BEM or meshfree methods like SPH, EFG, CPM, PFEM and DEM and combinations thereof.

Moreover, within LS-DYNA, it is possible to join different simulation phases without the necessity to define a tedious and time-consuming transfer to other software packages. Following this, a combination of the features provided by LS-DYNA easily allows for an integrative simulation of different mutually interacting physical phenomena on multiple scales.

For pre- and postprocessing, LS-DYNA comes with the LS-PrePost tool. The software package LS-OPT for optimization and robust design is also supplied with LS-DYNA. With the option of multidisciplinary simulations, LS-DYNA significantly increases potentials for developing innovative products. These advantages contribute towards reducing development costs. All above-mentioned features and software packages are supplied as a single unit and the licensing scheme enables the different disciplines to be combined without limitations.

DYNAmore GmbH
#### Gesellschaft für FEM Ingenieurdienstleistungen

DYNAmore is dedicated to support engineers to solve non-linear mechanical problems numerically. Our tools to model and solve the problems are the finite-element software LS-DYNA as solver and LS-OPT for optimization.

We sell, teach, support, and co-develop the software LS-DYNA and LS-OPT. In addition we provide engineering services for numerical analysis and integrate simulation software in your CAE environment. The majority of our customers are from the automotive and aerospace industry.

Many companies value the services of DYNAmore. Some examples of our customers:

- 13 of the 15 biggest car companies
- 11 of the 15 world wide biggest automotive suppliers
- All OEMs located in Germany
- 9 of the 10 largest German automotive suppliers
- The vast majority of German engineering services companies for crash simulation
- Almost all OEMs world wide use the dummy model developed by DYNAmore

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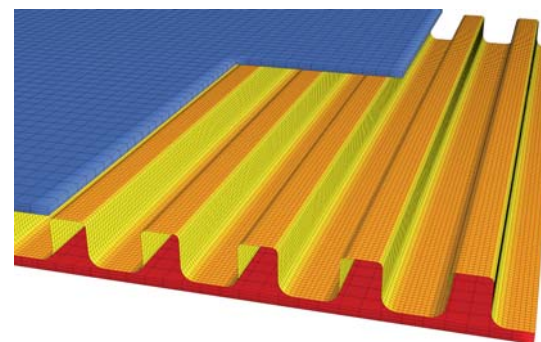
Invitation to the event series

Simulation of Polymers, Elastomers and Composites in LS-DYNA

Seminar:
Modeling of Polymers and Elastomers   4 - 5 Nov.

Information day (free of charge):
Composite Analysis   6 Nov.
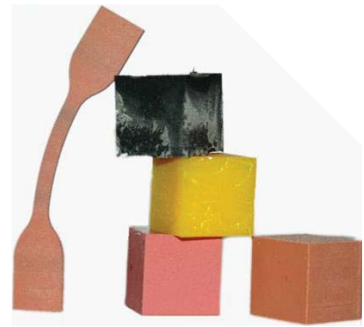
Seminar:
Introduction to Composite Modeling   7 - 8 Nov.

Modeling of Polymers and Elastomers with LS-DYNA

In recent years foam-, rubber- and glue-materials have become more and more important for a large variety of industrial applications. Especially foams are widely used in the automotive industry because of their energy absorbing properties and the advantageous stiffness to density ratio. Compared to other commonly used materials as for example steel or aluminum, the material behavior of foams is much more complex. The modeling of foams for a finite element simulation therefore represents a challenging task for the simulation expert. Rubber- and Glue-Materials are in general nonlinear elastic. Especially rubber materials show a very strong rate-dependent behavior, which has to be considered in the constitutive material formulation.

The program LS-DYNA offers its users a wide range of material models that have been developed exclusively for the modeling of foams and rubbers. The choice and the application of such special material models require a good basic knowledge of the theoretical as well as the numerical background.

It is the objective of this seminar to give an overview of the available material models for foams, rubbers and glues in LS-DYNA and on how to apply them properly. Additionally, the theoretical background of these models will be presented. Furthermore the topics parameter identification, experimental set-up and evaluation of experimental results will be discussed.

Small example problems will illustrate various application cases of the material models implemented in LS-DYNA.

Contents

- Presentation of various applications
- Discussion of the material behavior of polymers
- Foams
  - Reversible, crushable and semi-crushable foams
  - Appropriate material models for LS-DYNA
  - Preparation of test results and assumption
- Rubber Materials
  - Quasi-static and dynamic behavior
  - Incompressibility
  - Experimental set-up, data preparation
  - Parameter Identification
- Glue Materials
  - Structural glue, installation glue, pane glue
  - Modeling of a glue line
  - Material behavior and material modeling of glue
  - Tests for the evaluation of material parameters
- Thermoplastics
  - Material models for small deformations
  - Material models for large deformations
  - Experimental set-up, data preparation
  - Validation and verification

Date: 4 - 5 November
Location: DYNAmore headquarter Stuttgart
Lecturer: Prof. Dr. Stefan Kolling, TH Mittelhessen
Language: English
Fee: 1,100 € per participant
             50% academic discount, students free of charge, provided there are vacancies.
             All prices are subject to VAT, if applicable
Registration: www.dynamore.de/2013poly-e
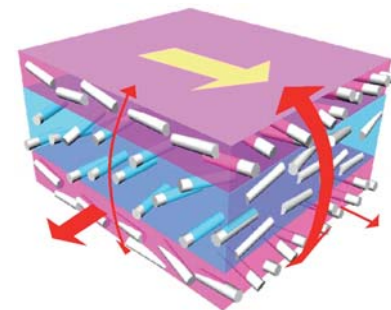
Courtesy of BASF AG

Composite Analysis with LS-DYNA

Due to the increasing importance of lightweight constru-ction, where the aim is not only to economize on weight but also to improve rigidity and strength, the use of composite materials has increased dramatically over recent years. If considerations are made regarding the use such materials for crash-relevant components, the requirements of simulation tools increase enormously – especially in automotive construction. As a consequence, numerous enhancements have been implemented in LS-DYNA.

The aim of this information day is to inform participants about the state of the art in simulating composite materials.

Agenda

13:30	Welcome
13:40	Efficient Methods for Stiffness and Failure Prediction for Short- and Long-fiber Reinforced Plastics Dr. Jan Seyfarth (e-Xstream engineering)
14:30	Micro-/Macro Modeling of Continuous Fiber-reinforced Composites and Thermo-formable Sheets with the DIGIMAT Material Modeling Platform Dr. Jan Seyfarth (e-Xstream engineering)
15:30	Coffee Break
16:00	On the Simulation of Draping, Thermo-forming and RTM Processes – Recent Developments in LS-DYNA Dr. Thomas Klöppel (DYNAmore)
16:30	Active Research Topics on Composite Simulation at DYNAmore Christian Liebold (DYNAmore)
17:00	Questions & Answers

Date: 6 November
Location: DYNAmore headquarter Stuttgart
Language: English
Fee: Free of Charge
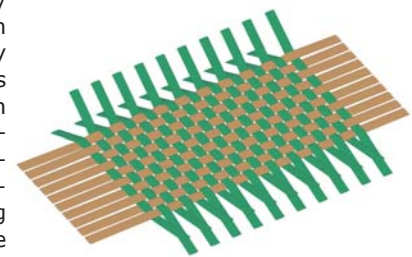Registration: www.dynamore.de/2013infocomp-e

In cooperation with

Introduction to Composite Modeling with LS-DYNA

Increasing requirements on resistance and durability in conjunction with weight reduction have advanced the development of composite materials very strongly within the last decades. Composites are no longer used for special applications or subordinate components, but increasingly for components in volume production. Hence concepts are on demand to capture the complex mechanisms of load transfer and failure within numerical simulations.

Very important subgroups of "Composites" are long fiber reinforced composite materials. They typically consist of high-strength carbon or glass fibers which are unidirectionally embedded in thin layers of an epoxy resin matrix. This seminar gives an overview on poten-tial modeling tech-niques of this sub-group. The strong anisotropy of these composite struc-tures leads to complex mechanical behavior which has to be captured in the simulation. Therefore, the available material models in LS-DYNA are introduced and discussed in-depth. Furthermore, different possibilities to model the phenomena of delamination are shown. The applicability and limits are demonstrated by means of small numerical examples.

Contents

- Introduction in composite materials
- Laminate theory
- Material modeling (material models in LS-DYNA, failure criteria of Chang-Chang, Tsai-Wu- and Hashin)
- Modeling of delamination
- Examples and visualization of results with LS-PrePost

Date: 7 - 8 November
Location: DYNAmore headquarter Stuttgart
Lecturer: Dr. Stefan Hartmann, Dr. Thomas Klöppel, Christian Liebold (DYNAmore)
Fee: 950 € per participant
             50% academic discount, students free of charge, provided there are vacancies.
             All prices are subject to VAT, if applicable
Language: English
Registration: www.dynamore.de/2013comp-e