



Locations:

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Airbag Particle Method Modeling (APM)
(a/k/a CPM Airbag Modeling)

Instructor: Alexander Gromer

1 Day - \$200, Students \$100 w/student ID

Includes on-site continental breakfast, lunch, breaks and class notes

Includes 30-day LS-DYNA® demo license to practice

Prerequisite: Attendees should have basic knowledge of LS-DYNA®

Description: First, this one-day course presents the fundamentals to create an airbag model in LS-DYNA®. A brief overview of the uniform pressure (UP) approach is discussed. Then the theoretical background and implementation of the newer airbag particle method (APM) is introduced. This latter method is based on a particle approach using molecular kinetic theory and has become state-of-the-art for all airbag applications due to its high accuracy, numerical robustness, and efficiency.

Besides the description of *AIRBAG_PARTICLE as well as the related keywords regarding definition of the control volume, number of particles, definition of vents, gas properties, etc. further modeling aspects affecting the airbag's behavior are discussed. State-of-the-art techniques as well as most recent implementations in LS-DYNA with their influence on the deployment behavior are presented.

Contents:

- Introduction
 - Basics
 - Different aspects of airbag modeling in LS-DYNA®
 - The uniform pressure method
 - o Available keywords related to different UP models in LS-DYNA®
 - o Wang-Nefske approach, hybrid gas generators and jetting definition for UP airbag models
 - o Available keywords and application of APM in LS-DYNA®
 - Merits and limits of UP modeling
- Airbag Particle Method (APM)
 - Influence of different parameters on the airbag's behavior
 - Merits and limits of APM modeling
- Material definition and reference geometry
 - Definition and influence of a reference geometry
 - Material definition using *MAT_FABRIC (non-linearity, anisotropy, porosity and validation)
- Contact definition and folding simulation
- Model set-up
 - Modeling advice regarding APM airbag models
 - Discussion of tank tests and airbag validation
 - Process chain for airbag modeling
 - Post processing of results
 - Examples