

Altair HyperCrash is a highly tuned pre-processing technology specifically designed to automate the creation of high-fidelity models for crash analysis and safety evaluation. Through a comprehensive and procedure-oriented toolset, Altair HyperCrash improves and simplifies the complex problems of creating a quality crash model.

Product Highlights

- Pre-processor for creation of high-fidelity models for vehicle crash analysis and safety evaluation
- Management of highly complex models including submodeling and include files
- Dummy positioning, seatbelt routing, and seat deforming
- Airbag folding, including reference geometry generation
- Mesh quality module, model, and penetration checker

Benefits

- Reduce model assembly and load-case set-up time from days to hours with advanced model management procedures
- Altair HyperCrash has built-in solver rules to avoid modeling mistakes during creation of most entities
- Easily manage penetrations, intersections, model assembly contact management, and dummy positioning
- The Altair HyperCrash database enables organizations to seamlessly support standard and proprietary corporate engineering procedures and data structures
- Altair HyperCrash enables part replacement at all modeling levels – component, subsystem and complete assembly
- A generic data model simplifies and optimizes model creation and modifications

Capabilities

GUI

Altair HyperCrash employs a modern graphical user interface (GUI) to provide

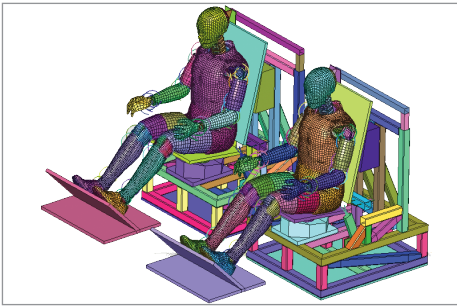
streamlined processes for building complex crash simulation models. Users can visualize, organize, and manage all levels of modeling data and information with a point-and-click access to the tree-style model browser. In addition, Altair HyperCrash provides a fast intuitive toolset for preparation and set-up of analysis input decks.

Multiple Solver Support

Altair HyperCrash is a multi-solver pre-processor with comprehensive interfaces to Altair Radioss™ and LS-DYNA. A huge library of dummies is supported. The model checker prevents user errors before the export of a model and numerous tailored panels help to set up models for both solvers. Altair HyperCrash also has an interface to read and edit PAM-CRASH models.

- Comprehensive support for over a thousand keywords
- Complete dummy positioning module
- Conversion between all supported solvers
- Belt systems

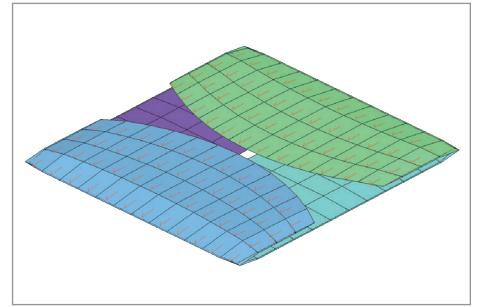
Learn more:
altair.com/hypercrash



Dummy positioning



Airbag folding



Review of material orientation check in an airbag model

- Joints
- Connections

Mesh Editing And Model Connections

Users can modify and edit crash meshes from within Altair HyperCrash or take advantage of the seamless integration with HyperMesh. Dependencies like contacts, loads and boundary conditions will be updated automatically. HyperCrash also offers many methods and options for editing and tuning a mesh for a crash analysis:

- Adding, duplicating, and moving nodes
- Finite element creation (1D, 2D, and 3D)
- Split parts or move elements from part to part
- Renumber selected entities, parts, or the complete model
- Clean the model by removing unused entities
- Create, modify, and check rigid bodies
 - Full support for connection types (Spotweld, Mastic, Adhesive, and more)
 - User defined connection representations

Safety Tools Module

This module provides a streamlined, user-friendly interface to set up, edit, and define all safety-related characteristics for crash simulation and analysis. In addition to the standard set of safety tools, HyperCrash

contains a unique seat-deformer utility that allows the seat foam - on both the lower and back of the seat - to be deformed based on the intersection between the dummy and the seat.

Safety features include:

- Dummy positioning
 - Interactively position dummy (torso, head, limbs)
 - Load and save dummy positions
 - Merge dummy in the model
 - Works with LS-DYNA & FTSS dummies
- Seat belt creation and routing
- Airbag toolset for creation and folding
- Seat deformer: Deform the seat automatically to remove the initial intersections with the dummy

Mass Balance

The Mass Balance module completely manages the mass and inertia properties of each part as well as the entire crash model.

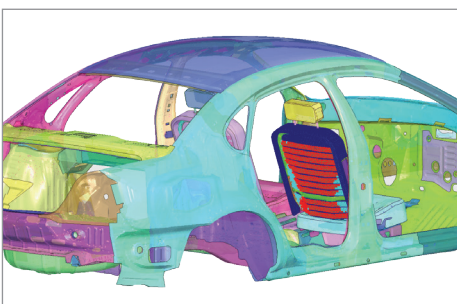
After the masses are set for all parts and components, HyperCrash automatically balances the total mass of the model according to the mass on the front and rear tires. HyperCrash can display, check, and report the center-of-mass locations for each part, rigid body and the complete model.

The mass of each part can automatically be fitted to the mass of the CAD part.

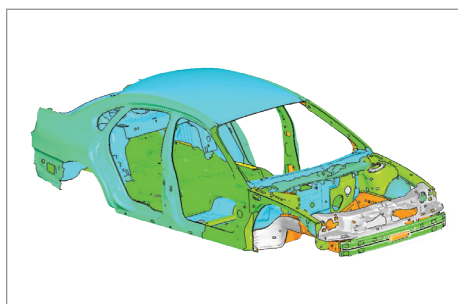
Quality

The Quality module is a configurable and customizable set of utilities for evaluating the quality of a model by performing hundreds of different checks on the part, component, and model level. A variety of checks are executed, ranging from simple element checks to part connectivity and modeling errors in the input deck. Users visually review the state of each check represented by status color (red, orange and green).

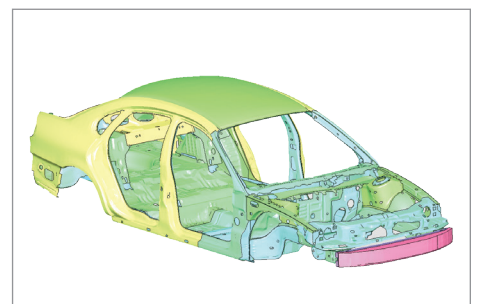
- Model Cleaner
 - Remove unused options
 - Check connectivity for failed welds, unconnected parts, and topology of connected parts
 - Automatically remove initial penetrations
- Model Checker
 - Exercises hundreds of unique checks
 - Model robustness for crash-worthiness criteria
 - User-defined criteria checks and filters



Contact status check based on solver algorithms



Thickness contour plot



Yield stress contour plot