



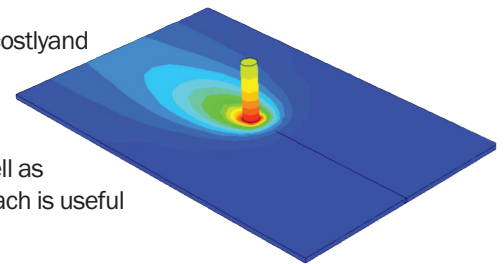
Altair Manufacturing Solutions

Altair introduces Manufacturing Solutions in HyperWorks 8.0, which is a unique and unified framework for the simulation of sheet metal forming; hydroforming; aluminum and polymer extrusion; injection molding; friction stir welding; and forging processes. It leverages the strength of HyperWorks' automation

language to deliver process-driven workflows for specific methods of manufacture. These process-centric automations increase the understanding and ease-of-use for CAE and non-CAE personnel to improve product manufacturability and process efficiency.

Friction Stir Welding

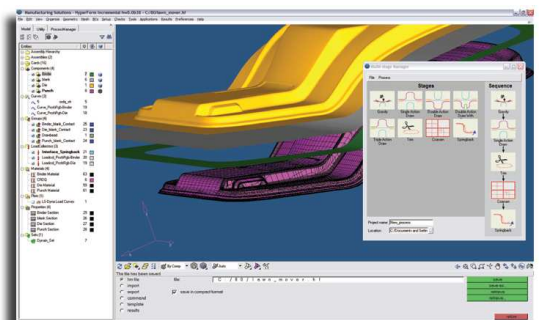
Simulation is used before the Friction Stir Welding (FSW) process to minimise the number of costly and time consuming weld trials needed to optimize FSW conditions and tooling. Altair's FSW simulation technology is based on finite element methods which simulates the thermomechanical performance of the tool and work piece. Simulated FSW parameters include: forces, moments, spindle motor torque and temperature distribution in the tool; as well as forces, deformation and temperature distribution in the work piece. This computational approach is useful to identify FSW process windows for a large number of materials, pin and joint types.



Metal Forming Simulation

Altair HyperForm is a finite element based sheet metal forming simulation tool. This easy-to-use, advanced virtual manufacturing software provides a complete desktop environment for:

- Forming, super plastic forming, multi-stage forming, springback and Hydroforming
- Early manufacturing feasibility assessment using HyperForm's fast and accurate inverse solver technology.
- Parametric die design
- Interactive morphing of die geometry
- User-friendly and automated incremental forming analysis using HyperForm Rapid Macros with RADIOSS and LS-Dyna solver technology
- Formability optimization using Altair HyperStudy

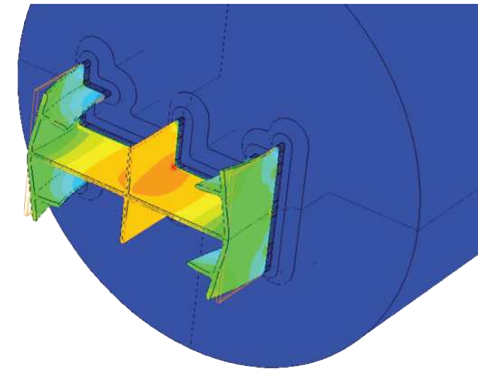


Extrusion

Altair HyperXtrude is a finite element based simulation tool for analysis and design of aluminum extrusion dies and process. HyperXtrude accurately simulates the material flow and heat transfer during extrusion processes thereby allowing the user to significantly reduce die design time and costly die tryouts. HyperXtrude is developed to meet the needs of extrusion process/product design engineers. HyperXtrude is capable of solving both metal and polymer extrusion problems.

HyperXtrude improves the productivity of design engineers by :

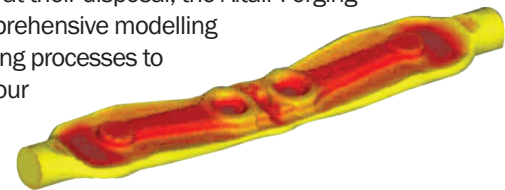
- Minimising die design time and cost through robust, reliable and fast analysis
- Helping troubleshoot existing dies
- Validating new die designs
- Automatically optimizes bearing length and porthole design



Forging

Forging is a powerful new interface to DEFORM for performing advanced forming operations in a virtual environment. The process driven setup is fully automated, designed to save your engineers' time and your organisation's money by removing the need to perform trial and error physical tests on forming operations. Today's competitive pressures require companies to take

advantage of every tool at their disposal, the Altair Forging interface provides comprehensive modelling functionality of the forging processes to improve the quality of your designs.



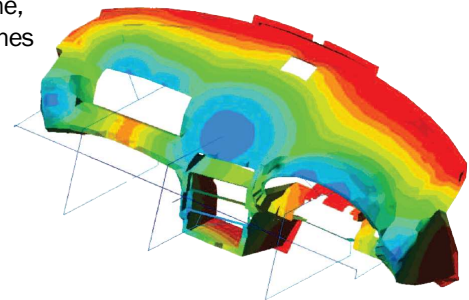
Plastic Injection Moulding

The Moldflow interface in Altair HyperWorks represents major enhancements over previous versions with regard to the broad support it provides for MPI (Moldflow Plastics Insight) attributes and the ease with which a model can be setup for Moldflow analysis. One of the important features in the interface is the macro menu system that creates a step-by-step process flow to setup a Moldflow data deck.

Interface Highlights :

- Powerful automatic midsurface generation and editing tools
- Support for all MPI element types

- Easy to use GUI to edit and update all property cards
- Diagnostic tools to check element thickness, aspect ratio, occurrence number, mesh match ratio and element overlap.
- Direct export for Midplane, Fusion and Flow3D meshes in UDM or MFL format
- Results translation and post-processing using HyperView



Robustness and Optimization

Geometry morphing, advanced optimization and robustness capabilities are now available throughout Altair's manufacturing solutions. These include industry leading morphing functionality and specialised morphing capabilities for die engineers to quickly modify die-entry radii, wall angles and other die face features. All shape changes can be automatically exported as IGES surfaces for easy data exchange with native CAD systems. Shape changes can also be defined as shape variables to efficiently perform Design-of-Experiments, optimization and stochastic studies using Altair HyperStudy.

