Altair® HyperWorks®

The Enterprise Solution for Product Innovation

RADIOSS™

A Proven Transient, Dynamic Solver to Simulate Real-World Performance

RADIOSS is a comprehensive transient, dynamic finite-element solver to simulate impact, safety-related performance, manufacturing processes and fluid-structure interaction problems.

Over the past 20 years, RADIOSS has become the nonlinear solver of choice of leading manufacturers, government agencies and researchers.

From consumer product drop-testing to vehicle crash analysis, from terminal ballistics to explosions, RADIOSS provides a world-class solution to solve today's most complex physics problems.

RADIOSS™

RADIOSS is a finite-element solver technology for explicit or implicit analysis. Leveraging a wide range of formulations such as Lagrangian, Eulerian, Arbitrary Euler-Lagrange (ALE) and Smooth Hydrodynamic Particles (SPH) RADIOSS is a robust solver solution for mechanical, structural, fluid and fluid-structure interaction problems for static, dynamic or transient loading conditions.

RADIOSS accurately simulates the performance of structures that are subjected to large strains, displacements and rotations by using a comprehensive library of material laws.

Full Frontal Crash Simulation

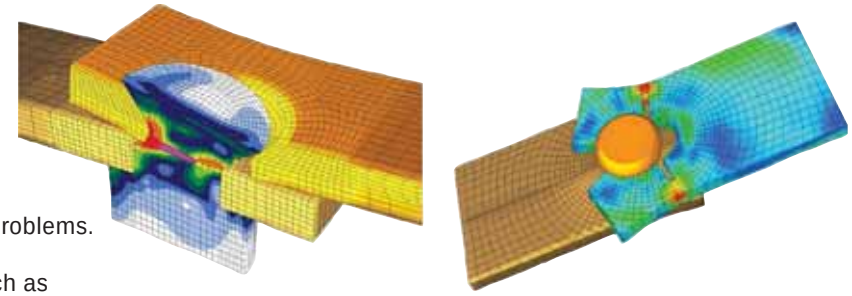
BENEFITS

Performance and Scalability

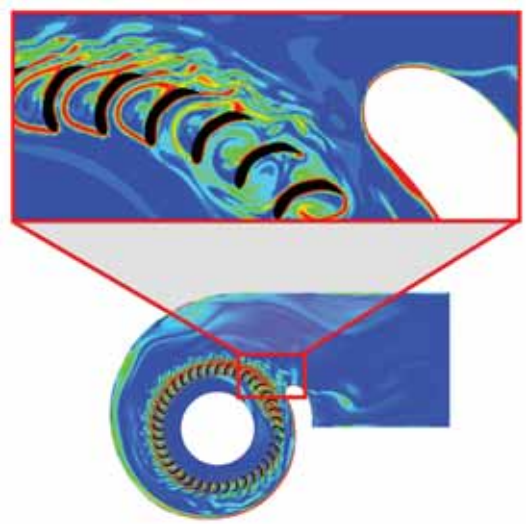
- Highly parallelized for efficient computing
- Results consistency regardless of number of processors

Technical

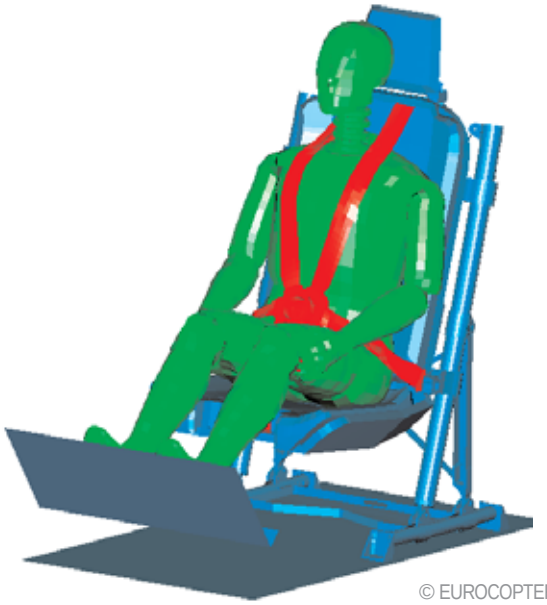
- Efficiently and accurately solves the toughest contact problems.
- Multi-physics solver handles the toughest problems such as mechanical, structural, fluid or fluid-structure interaction under dynamic loadings. In addition, it provides solutions for linear and nonlinear problems under static loadings and a transient analysis for thermal problems.
- Robust and effective solver provides a highly paralleled and linearly scalable solution.
- Highly accurate regardless of the number of processors for explicit analysis.
- Versatile and comprehensive collection of material laws and rupture models.
- Easy setup for robustness and optimization studies through a tightly integrated connection with HyperStudyDSS.
- RADIOSS features a Navier Stokes solver that includes explicit turbulence models for fluid-structure or transient aero-acoustic analysis.
- RADIOSS provides a direct coupling between explicit and implicit solutions and is a single-source solver with a common internal force computation.



Rivet Failure Analysis

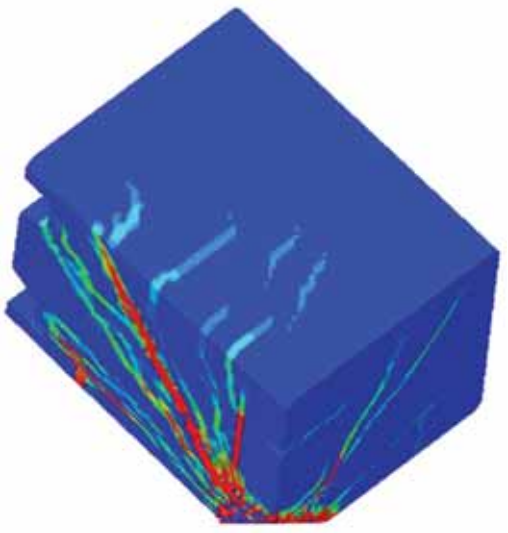


Centrifugal Fan Noise



© EUROCOPTER

Sled Test on Hybrid2 Dummy



© ANDRA

Nuclear Container Calibration

APPLICATIONS

The RADIOSS solver handles a wide variety of CAE problems while providing a highly accurate and scalable solution.

- STRUCTURE behavior simulation:
  - Structural simulation under dynamic loadings, including crash, shock, impact, earthquake, wave propagation, etc.
  - Linear and nonlinear vibration analysis (modal and frequency domain).
  - Linear and nonlinear static simulations.
- SAFETY simulation, including airbags using a uniform pressure for modeling the gas flow (Coupling Euler Lagrange and Finite-Volume Method), ideal for out-of-position.
- BIOMECHANICS simlulation, including injury mechanisms, prostheses implementation and wear (examples: hip, knee and teeth), understanding lesion mechanisms (examples: sporting injuries and safety).
- MANUFACTURING PROCESS simulation including stamping (multi-staging and single stage), springback analysis, hydro-forming, tube bending, machining, etc.).
- MULTI-PHYSICS simulation:
  - Fluid-structure interaction: Hard-debris impact on a fluid-filled structure, tank-sloshing, hull-slamming, airplane-ditching, landing on soft ground, detonics science, pyrothenic cutting.
  - Aero-acoustics analysis: Determination of noise sources; acoustic-intensity determination of a structure under fluid solicitations.
  - External aerodynamics: Transient air flow around a structure (examples: headlight, fan and moving surfaces) .

WORLD HEADQUARTERS
UNITED STATES
www.altair.com

AUSTRALIA
www.altairengineering.com.au

BRAZIL
www.altairengineering.com.br

CANADA
www.altairengineering.ca

CHINA
www.altair.com.cn

FRANCE
www.altairengineering.fr

GERMANY
www.altair.de

INDIA
www.altair-india.com

ITALY
www.altairengineering.it

JAPAN
www.altairjp.co.jp

KOREA
www.altair.co.kr

SWEDEN
www.altair.se

UNITED KINGDOM
www.uk.altair.com

Altair Engineering, Inc., World Headquarters: 1820 E. Big Beaver Rd., Troy MI 48083-2031 USA
Phone: +1.248.614.2400 • Fax: +1.248.614.2411 • www.altair.com • info@altair.com