ALTAIR FOR CIVIL ENGINEERING

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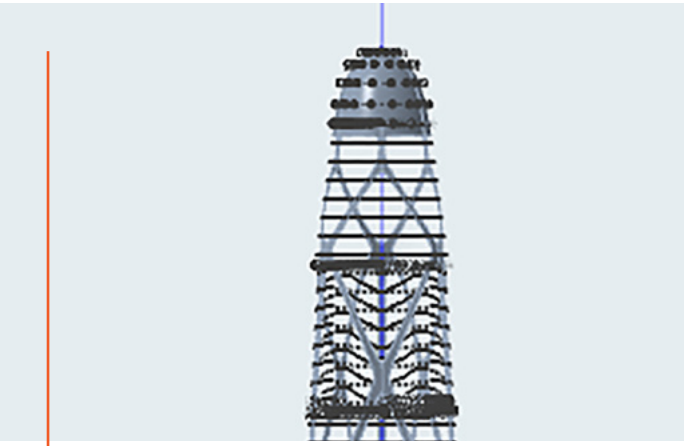
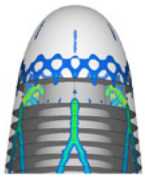
Civil engineers gain insight throughout the development process to rapidly evolve designs, control costs and ensure structures are safe and feasible. Architectural teams can unleash their creativity and see their concepts validated quicker and with fewer design iterations, while structural teams enhance their design process with automatic optimization workflows to achieve maximal performance. Simulation tools help model and accurately predict the unique behavior of advanced composite materials and optimize their shape and manufacturability to meet performance and cost criteria.

PRACTICE HIGH-PERFORMANCE DESIGN

Altair has developed a multi-disciplinary optimization workflow that allows clients to understand structural performance sooner, accelerate design cycles to reduce cost, and virtually validate designs to reduce risk. High-performance design is a holistic approach for developing feasible, safe and robust structures with a simulation-driven approach.

Altair's repeatable and customizable workflow combines wind loads with most advanced optimization techniques. The cost and time to deliver complex steel structures can be reduced thanks to automatic workflows capable of integrating all the major AEC structural solvers via direct link or neutral file formats, the power of size optimization for steel sections in 1D models, and topology optimization for 3D models to find the optimal load path.





Altair provides workflows to integrate and automate component-level and advanced optimization of steel structures

FAST ALTERNATIVE DESIGN WITH MESH-FREE SOLVER

Architecture, Engineering, Construction (AEC) design cycles have two crucial requirements: product performance and timely delivery. Due to immense project pressures, there is often insufficient time to investigate design alternatives or new solution. Altair SimSolid™ is a technological breakthrough that allows civil engineers to analyze fully featured CAD assemblies in minutes, eliminating geometry simplification and meshing. These insights allow engineers to foresee better alternatives in large structural models and rapidly evolve designs within existing project timelines. With SimSolid, design teams can perform multiple iterations of their most complex parts and explore multiple alternatives of large assemblies at blazing speed.

Doppelmayr Seilbahnen GmbH uses SimSolid to rapidly evaluate design feasibility in the construction of cable cars

AERODYNAMIC INSIGHT FROM DESIGN TO VALIDATION

Computational fluid dynamics (CFD) has become a powerful tool deployed throughout the AEC design workflow. For designers, concept-stage aerodynamic simulation helps shape designs to uphold the client's vision while adhering to downstream performance targets.

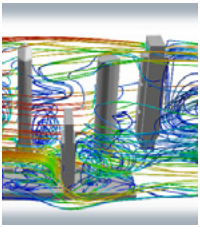
Using digital wind tunnel testing, it is now possible to investigate multiple design alternatives to determine feasibility and update shapes on the fly. For detailed validation in the latter stages of development, Altair CFD tools provide a granular understanding of aerodynamic phenomenon, mitigating risk and ensuring safety and stability of the structure.

The Altair technology portfolio includes leading CFD tools that leverage both CPU-based Naiver-Stokes and GPU-based Lattice Boltzmann methods, allowing clients to select the best method to meet their challenges and project requirements.

FAÇADE ENGINEERING AND MANUFACTURING

The design of modern façade systems requires a multi-disciplinary approach, supporting all key aspects of façade engineering; structural engineering, thermal analysis, manufacturing and protective design.

- Structural engineering: Altair's technology streamlines the assessment of structural integrity, even for complex parts and large assemblies with hundreds of parts and bolts with pre-tensioning, weld lines, contacts and friction, with fast and intuitive tools for both linear and all non-linearity analyses.
- Thermal analysis: Energy consumption and thermal effects can easily be calculated leveraging Altair's suite of CFD tools.
- Blast simulation: Protective design simulation allows civil engineers to predict the effects of blast and explosion on critical structural systems.
- Façade Manufacturing: Altair's manufacturing feasibility software simulates part extrusion profiles, providing end-to-end solutions for façade development.



Virtual wind tunnel testing produces accurate modeling of wind pressures and enables designers to explore and evolve concepts based on CFD insights

HELPING THE INNOVATORS INNOVATE, DRIVE BETTER DECISIONS, AND TURNING TODAY'S PROBLEMS INTO TOMORROW'S OPPORTUNITIES.

ALTAIR TRENDING IN:

Additive Manufacturing
Autonomous & ADAS
Big Data
Cloud Computing
Data Transformation
Digital Twin
e-Mobility
Exascale
GPU Solutions
Lightweighting
Machine Learning
Mechatronics
Smart Product Development
5G

Altair OptiStruct™ provided many design options for our team and we were able to use the analysis results to inform our final design.

This project had many architectural requirements and structural challenges, but by working with Altair and other optimization software we were able to succeed efficiently."

Alessandro Beghini, SOM

ALTAIR

Altair is a global technology company that provides software and cloud solutions in the areas of product development, high performance computing (HPC) and data analytics. Altair enables organizations across broad industry segments to compete more effectively in a connected world while creating a more sustainable future.

To learn more, please visit altair.com