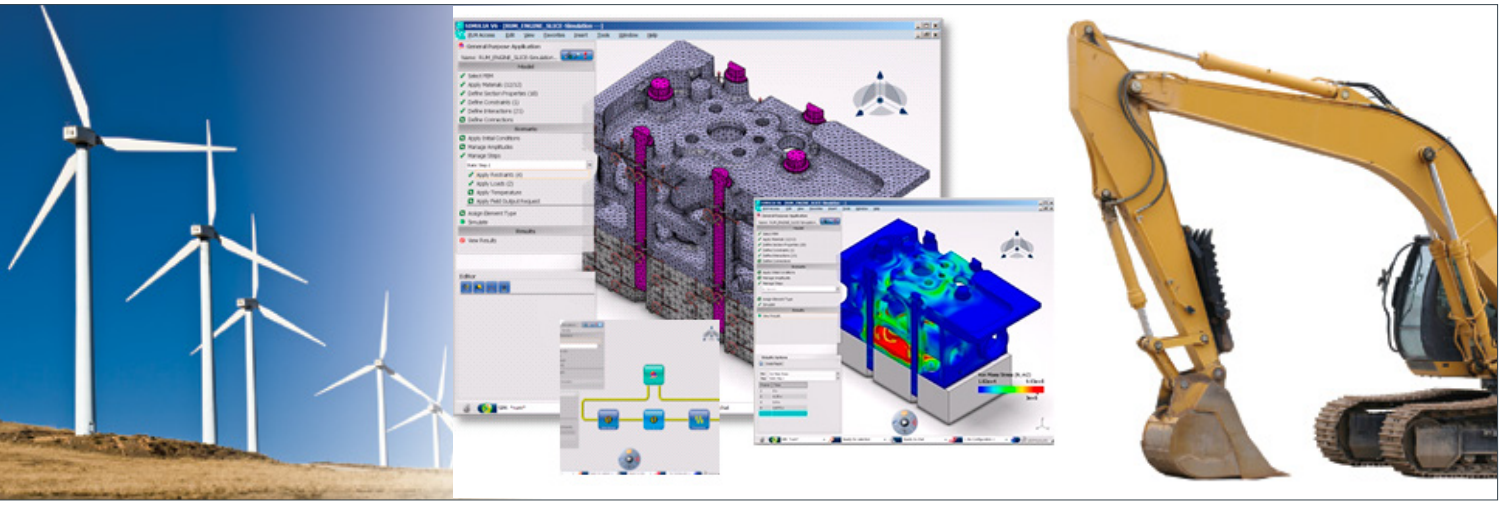
SIMULIA | ExSight

Realistic modeling environment on the powerful 3DEXPERIENCE platform for simulation experts using Abaqus



ExSight

Overview

ExSight Multiphysics is the next generation finite element and multiphysics analysis solution from SIMULIA, the Dassault Systèmes brand for Realistic Simulation. ExSight creates Abaqus models and leverages the **3D**EXPERIENCE platform to provide global collaboration with simulation data managed in a common corporate database, driving better design decisions and improved product performance. Features such as user status, immersive chat, and snapshot views facilitate efficient communication between users for improved design innovation.

ExSight enables engineering analysts to set up a wide range of complex, real-world Abaqus simulations through world-class finite element model building, meshing, scenario definition and results visualization tools, while maintaining full CAD associativity.

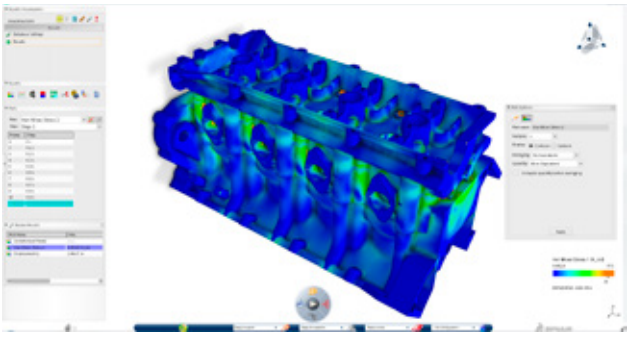
Features & Benefits

- Define Abaqus simulations using efficient tools to define the model and scenario and to visualize the simulation results.
- Configure the user interface and capabilities for target workflows such as vertical applications.
- Create and interpret multiphysics simulations on the 3DEXPERIENCE platform with CAD associativity and efficient tools for collaboration.
- Setup simulations for requirements driven design and manage simulations for full traceability.
- Turnaround large models rapidly using high performance computing resources allowing more designs to be assessed.
- Interrogate of realistic simulation results with speed, clarity and control on the desktop for enhanced decision making.

ExSight Highlights

Build Abaqus models quickly and easily in a managed, collaborative environment

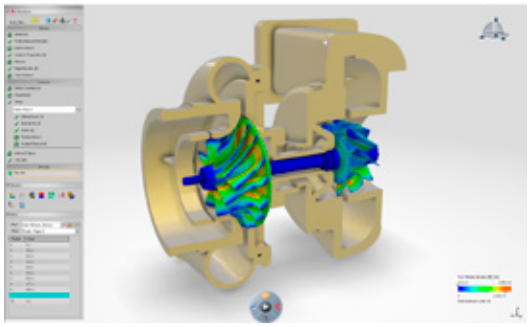
ExSight makes it easy to set up and run large complex Abaqus simulations with a modern, intuitive user interface. The **3D**EXPERIENCE platform that is the foundation of ExSight manages the entire lifecycle of the simulation and provides a collaborative environment. Models built with ExSight are analyzed using the proven technology of Abaqus, providing high performance solutions that analysts can trust.



The combined resources of remote compute servers and client machines enables efficient post processing for very large models such as a powertrain assembly.

Meshing

ExSight can generate FEM meshes automatically as well as providing extensive meshing tools. Multiple mesh representations, with different mesh sizes and geometry simplifications (fillet removal, hole filling...), can be generated and used for various types of simulations. The mesh is fully associated with the geometry and can be easily updated following geometric modifications without having to recreate the analysis attributes. Large assemblies of several hundreds of shell parts can be meshed efficiently using the rule-based batch meshing technology.



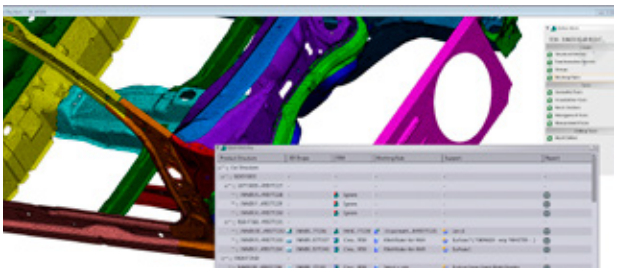
Material rendering can be applied to select components during results visualization to produce lifelike representations of results images.

Materials and Sections

ExSight allows materials to be defined for simulations and stored for future use. Convenient search and management tools make it easy to obtain the correct material properties and apply them to the model. Material definitions can be imported from external files such as 3DXML, FBDI and the Abaqus input (*.inp) file. Available material models include elastic, plastic, hyperelastic and viscoelastic. Solid, shell, composite shell, continuum shell, gasket and beam sections are supported.

Connections and Contact

A wide range of connections can be modeled in ExSight including generalized couplings, tie constraints, spot-welds and seam-welds. Virtual bolts, masses, inertia and springs can be defined. Contact capabilities include general contact, an automated contact search tool, as well as manual, surface-based definition.



ExSight's rule-based mesher allows high-quality meshes for large assemblies to be created quickly.

Simulation

Multi-step, nonlinear static, dynamic and harmonic response simulations can be setup in ExSight. Buckling analysis determines the critical buckling load for slender structures. Steady-state and transient heat transfer analysis determine the temperature distribution and study heat flow. Additionally, frequency simulations can be defined to calculate the natural frequencies of the model. For each simulation step, attributes can be defined and the analysis parameters can be adjusted.

Loads, Restraints, and Initial Conditions

ExSight provides several load and restraint tools for creating realistic simulation scenarios. Available structural loads include pressure, force and torque, gravity, bearing, bolt loading and applied translation and rotation. Available restraints include a general displacement restraint, symmetry, slider, hinge, clamp and a grounded ball joint to enable a surface to rotate freely. Loads and restraints can be created and modified in different steps of the simulation and loads can be varied within a simulation step by associating it with an amplitude definition.

Results Visualization

ExSight provides several tools for visualizing the simulation results. These include undeformed and deformed display, contouring, and symbol plot. Extreme values can be visualized along with results at different locations using an interactive probe. Display groups enable the results display to be limited to a subset of the model for closer inspection of the results. Flexible view cuts can be used to cutaway a part of the model to display the results on the interior. User selected results can be ouput to a simulation report.