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Simcenter 3D environment for MSC Nastran

Pre- and postprocessing analysis models in Simcenter 3D for the MSC Nastran solver

Benefits

- Enables engineers using Simcenter 3D to generate finite element models for the MSC Nastran solver
- Simplifies the MSC Nastran modeling process by enabling engineers to create analysis models based on geometry or legacy MSC Nastran data files
- Reduces or eliminates intermediate manual processing of data files by generating run-ready decks directly from Simcenter 3D
- Immerses engineers in the MSC Nastran environment through familiar MSC Nastran terminology and extensive support of MSC Nastran-specific elements and entities

Summary

The Simcenter 3D environment for MSC Nastran software enables engineers to build finite element models, define solution parameters and view the solution results for the MSC Nastran solver. The environment immerses engineers with familiar MSC Nastran language for element definitions, loads and boundary conditions, solution parameters and other common MSC Nastran nomenclature. In addition to model definition capabilities, the MSC Nastran environment provides bi-directional import/export capabilities that enable you to import current or legacy MSC Nastran bulk data files and results as well as export run-ready MSC Nastran data files.

Simcenter 3D's powerful geometry editing and meshing capabilities are ideal for pre- and postprocessing models for MSC Nastran. Simcenter 3D simplifies the modeling process by integrating high-end finite element modeling tools with world-class geometry capabilities that assist you with developing analysis models faster than with traditional CAE preprocessors.

Adding the MSC Nastran environment to Simcenter 3D enables you to build MSC Nastran run-ready bulk data decks, so little or no intermediate processing is ever needed. In addition to building MSC Nastran models, the MSC Nastran environment imports solution results directly from MSC Nastran binary results files into Simcenter 3D for postprocessing. The environment delivers import/export capabilities so you can import MSC Nastran data decks into Simcenter 3D for modification and then export run-ready decks for solution.

Import/export MSC Nastran models

- Import/export complete MSC Nastran finite element models including bulk data as well as executive and case controls
- Import model information from either bulk data decks or binary output2 files

Create MSC Nastran models in Simcenter 3D

- Create complete run-ready MSC Nastran decks including executive and case controls, bulk data
- The MSC Nastran environment supports solutions 101, 103, 105, 106, 107, 108, 109, 110, 111, 112, 129, 153, 159 and 200

Elements and other entities

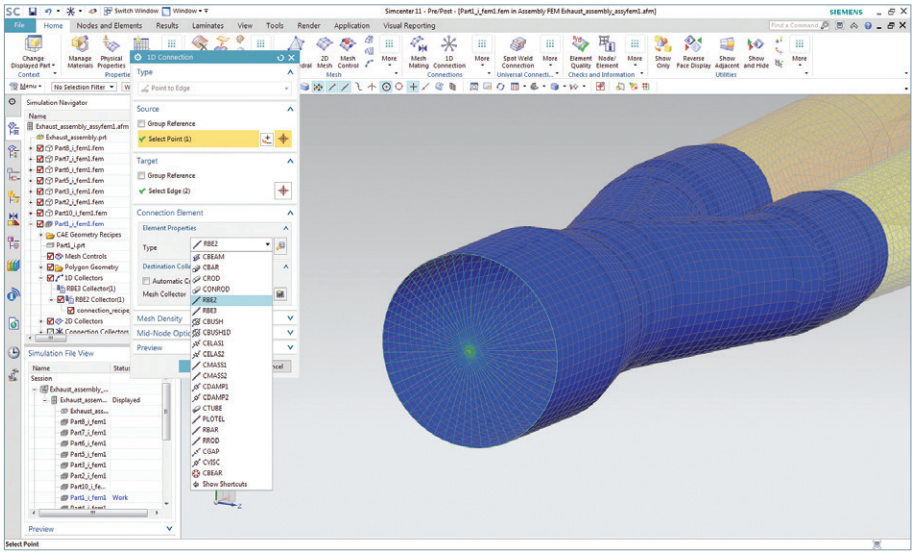
- A wide variety of elements and other model entities are supported.
- Lumped mass, spring, rigid elements
- Axisymmetric solid elements
- Rod, beam and bar elements
- Shell and solid elements
- Permanent single-point constraints

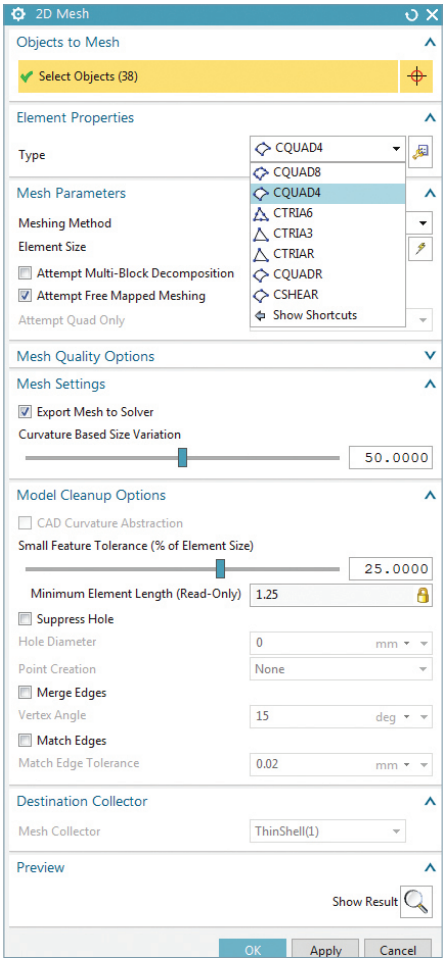
A complete list of MSC Nastran import/export entity support is provided in the Simcenter 3D online help.

Simcenter 3D environment for MSC Nastran

Loads and boundary conditions
Loads and boundary conditions for structural and thermal analysis are supported.

- Nodal, elemental and geometry-based structural loads
- Beam-concentrated and distributed loads
- Gravity, rotational velocities and acceleration loads
- Nodal, elemental and geometry-based thermal heat loads
- Nodal restraints and temperatures
- Traction loads
- Time and temperature variations
- Subcase manager to easily manage the loads used in each subcase





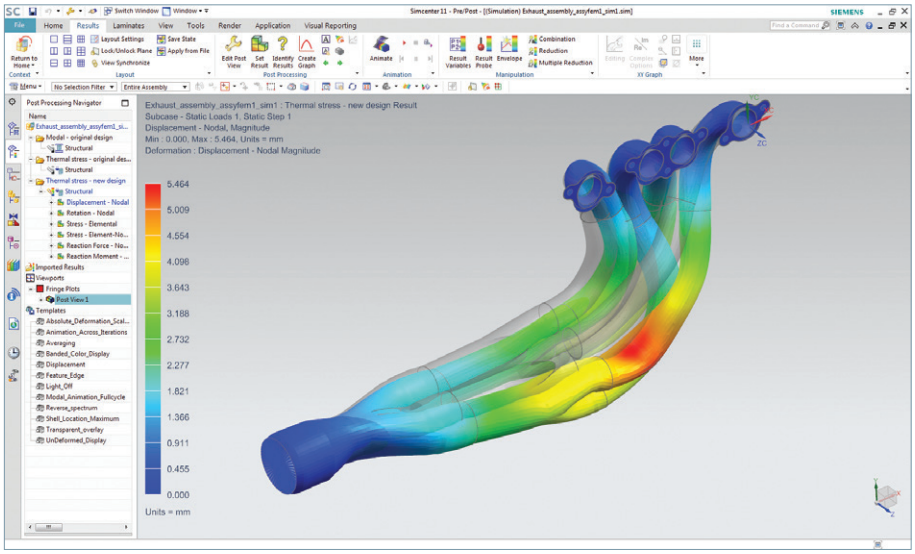
Automatic connection mesh support
Simcenter 3D provides a number of solver-supported methods for connecting different meshes together.

- The mesh mating condition connects individual 2D or 3D meshes together at a specified interface.
- The edge-face connection defines the connection between a set of edges and a set of faces. You can use this feature whenever there are meshes to be connected in T-junction configuration; for example, fins or stiffeners attached to surfaces.
- Weld mesh locates and automates the recognition of weld features (connections) and then automatically creates their FE model representations, including consideration for mid-surfaces. You can use weld mesh to create weld elements (1D mesh) from weld features.

Compatibility
The MSC Nastran environment is compatible with the following MSC Nastran releases:

- MSC Nastran v2017 or earlier

Supported hardware/OS
The MSC Nastran environment is an add-on module within the Simcenter 3D suite. It requires a license of Simcenter 3D Engineering Desktop or Simcenter 3D Structures as a prerequisite. It is available on all Simcenter 3D supported hardware/OS platforms (Windows and Linux).



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