

Simcenter STAR-CCM+ geometry handling

Facilitate design processes by easily creating, modifying and preparing geometry

Benefits

- Integrate easily with existing design processes by importing geometry from a broad range of leading CAD and PLM software tools
- Create, modify and repair geometry using the integrated CAD modeler
- Combine CAD originating from various sources in a single simulation
- Improve efficiency with automatic geometry cleanup, search tool, surface repair and surface wrapping
- Enable powerful design exploration with an automated CAD-to-mesh process

Summary

Retaining the geometric fidelity of your product without disproportionately affecting simulation throughput is a major obstacle in performing real-world engineering simulations. As model complexity increases, engineers risk spending too much time performing manual and repetitive tasks, such as:

- Cleaning and defeaturing dirty or incomplete computer-aided design (CAD) geometry
- Combining CAD models originating from various sources using multiple tools
- Preparing scripts to handle updating of design variants

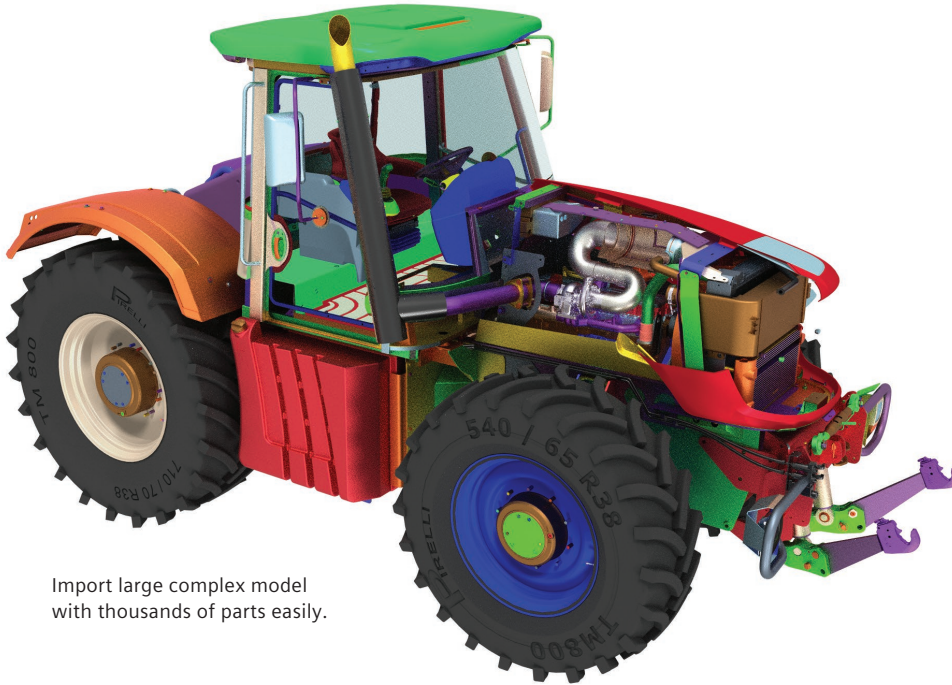
Eliminating these potential bottlenecks is critical to allowing engineers to spend their time doing what they do best: innovating.

Simcenter STAR-CCM+ offers the solution

Siemens Digital Industries Software's Simcenter™ STAR-CCM+™ software helps you maximize productivity with robust automated workflows that ensure complex geometries are quickly ready to mesh. The single integrated user interface facilitates geometry handling, allowing users to:

- Efficiently handle large, complex models coming from various sources, including external CAD packages as well as an integrated 3D-CAD modeler
- Effortlessly clean up geometry with powerful tools, including automatic defeaturing in 3D CAD, manual surface repair and surface wrapping
 - The pipelined mesh operations process enables a broad range of workflows that can be created for any application
 - Automatic and manual preparation tools allow the user to work on dirty or incomplete geometry
- Seamlessly parameterize and automate design changes enabled by the single integrated user interface and repeatable CAD-to-solution processes

Simcenter STAR-CCM+ geometry handling



Import large complex model with thousands of parts easily.

- Combine imported models with components created in 3D CAD
- User-controlled model defeaturing and interactive CAD repair tools

Geometry preparation

Surface wrapping: fully automatic wrapping with projection to underlying CAD to provide a clean, closed surface ready for volume meshing

- Reduce the geometry preparation time from weeks to hours with the surface wrapping of large complex geometry

Manual surface repair: easy-to-use, comprehensive manual repair tool for preparation of CAD or imported tessellated geometries

Capabilities

Geometry handling

CAD exchange:

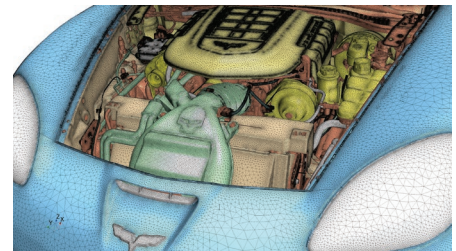
- Import native and neutral formats using the Windows® or Linux® operating systems with high-quality geometry retention and fidelity
- Retain full data structure and organization from your CAD package including parts and assembly history, geometry, features, names, etc.

CAD clients:

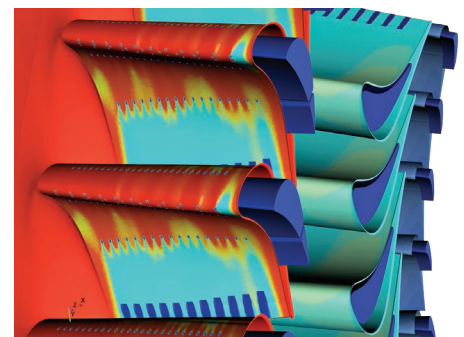
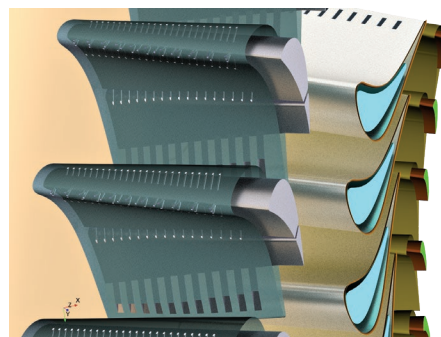
- Direct transfer of geometry is possible from the CAD environment
- Design parameters can be transferred and modified bi-directionally, along with reference data and coordinate systems for design space exploration
- Multiplatform communication is easy with operation orchestration across resources and operating systems

3D CAD:

- Save engineering time by utilizing the integrated CAD environment for CAD creation and design exploration
- Parameterize a model in a few clicks with feature-based geometry modeling and freeform technology
- Easily investigate, prepare and organize the models using the search tool, interactive sections and explode views



Trimmed volume mesh on a Corvette geometry cleaned up with surface wrapper.



Repeatable CAD-to-solution for analysis of turbine geometry created in 3D CAD.

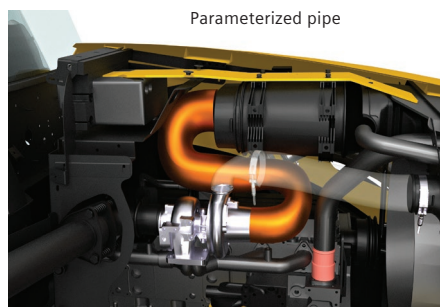
Pipelined mesh operations: user-defined and flexible pipeline for sophisticated combinations of operations, which allow automatic preparation of geometries, irrespective of their sources

- Extensive set of operations for geometry preparation, including Booleans, surface wrapping and multipart imprinting

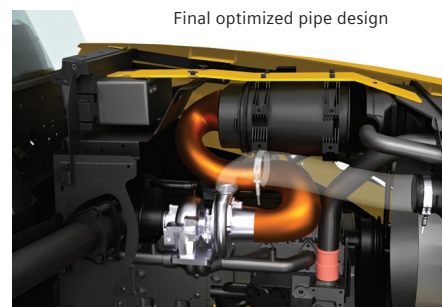
Design exploration

Seamlessly deploy design space exploration in a single integrated user environment. With Design Manager built into Simcenter STAR-CCM+, you can:

- Effortlessly execute model updates with a robust, automated workflow
- Automatically manage dirty geometries with the surface wrapper fully within the design exploration process
- Automate exploration of geometric designs by modifying parametric CAD models in the 3D CAD module as part of your study
- Explore designs using native CAD tools via CAD clients

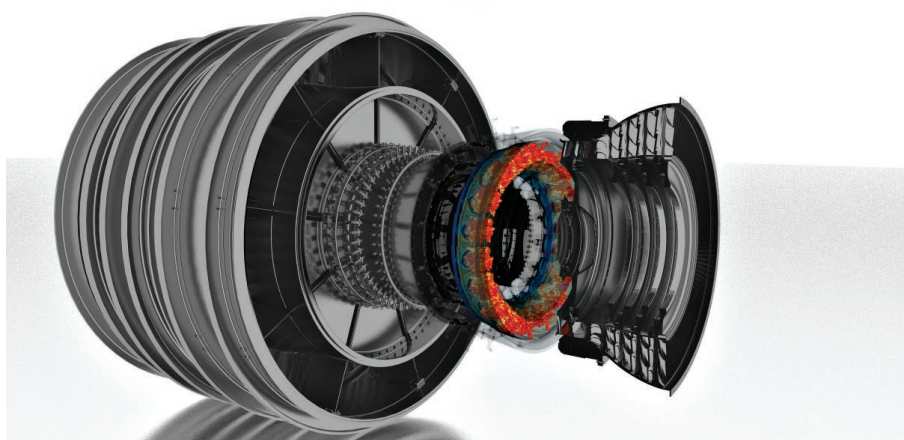


Parameterized pipe



Final optimized pipe design

Optimized tractor pipe using parameterization for quick design study.



Combustor simulation with geometry handled using the NX CAD client.

Siemens Digital Industries Software
[siemens.com/software](https://www.siemens.com/software)

Americas +1 314 264 8499
 Europe +44 (0) 1276 413200
 Asia-Pacific +852 2230 3333

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