

coreform

Cubit™

GEOMETRY

Break the geometry bottleneck to reduce modeling time

Preparing CAD geometry for meshing consumes more time and resources than any other stage of the CAE process. Cubit provides powerful, user-guided automated tools to make geometry cleanup and simplification fast and satisfying.

Build solid geometry directly or import CAD

Create solid geometry directly in Cubit, or import geometry from leading CAD platforms. Modify with transform or Boolean operations.

Auto-heal dirty CAD

Geometry analysis and repair tools diagnose and fix geometric and topological errors from imported CAD by trimming, stitching, and rebuilding.

Clean up and defeature with smart tools

User-guided, automated routines detect and remove undesirable features such as fillets, chamfers, and sliver curves and surfaces.

MESHING

Mesh any CAD geometry with robust hex and tet algorithms

Coreform Cubit supplies a comprehensive meshing feature-set for surface and solid meshing with a wide variety of element types and methods for automating and streamlining mesh creation.

Battle-tested algorithms

Deep stock of mesh generation algorithms including paving, mapping, sub-mapping, sweeping and multi-sweeping.

A comprehensive toolset for streamlined geometry cleanup and mesh generation

Coreform Cubit includes everything needed for streamlined progress from CAD to analysis, with full-featured capabilities for geometry preparation and mesh generation, analysis, and fine-tuning.

Key Features & Capabilities

Comprehensive toolset

Everything you need for fast geometry cleanup, meshing, and export.

Semi-automated hex meshing

Rich set of tools for streamlining the creation of analysis-ready models

Expert-level mesh control

Industry-leading mesh analysis and improvement tools for complete control from Jacobians to vertices.

Scripting & automation

Python integration and scripting tools to increase simulation speed and throughput

Smart workflow wizard

Step-by-step guidance through geometry preparation and mesh generation.

Smart controls

User-guided adaptive or fully automatic interval sizing and scheme selection.

Unrivaled hex meshing

State-of-the-art structured and unstructured quad- and hex-dominant meshing with powerful, smart automation options.

Multi-scheme tet meshing

Multi-scheme automatic tri/tet meshing schemes with Distene MeshGems, Delaunay, and advancing front algorithms.

MINIMUM REQUIREMENTS OS Windows 7 or newer, 64-bit; Red Hat 7, 64-bit (or similar system with at least glibc 2.5 and libstdc++ 4.4); SUSE 12; Debian 6; Ubuntu 10.4 or newer; Mac 10.11+, 64 bit only. **Hardware** 4GB RAM (8GB or more recommended), 1GB disk space. Graphics card and driver capable of supporting OpenGL 3.2.

AUTOMATION

Semi-automated hex meshing with interactive smart tools

Smart workflow wizard

Step-by-step guidance through geometry preparation and mesh generation, with user-interactive diagnostics and smart suggestions.

Smart sweep suggestion & forcing

Automatic recognition of nearly sweepable topologies and identification of potential source-target pairs. Automatic surface-compositing to force a sweep topology.

Smart decomposition

Smart detection/suggestion of decomposition operations needed to enable mapping, sub-mapping or sweeping schemes.

Autoscheme hex meshing

Automatic meshing scheme selection based on user-adjustable topological and geometric criteria.

Imprint & merge

Unique suite of interactive, automated tools to enable efficient and robust conformal meshing of multi-volume assemblies.

CONTROL

Expert-level mesh controls for superior quality and precision

Industry-leading capabilities for specifying mesh properties, analyzing mesh quality, and performing precise local or global mesh modifications.

Mesh quality analysis and visualization

Quality analysis with general and element-type-specific metrics for quad, tri, tet, hex, and wedge elements, including aspect ratio, area/volume, min/max angle, Jacobians, condition number, distortion, and approximate maximum timestep (for explicit transient dynamics).

Mesh property controls

Adaptivity and sizing function options for controlling mesh density in response to geometric or user-defined properties, including local field variable solution values from previous analyses. User-specified fixed or variable-firmness interval sizing, including arc span and curve biasing.

Mesh smoothing and optimization

Smoothing algorithms: equipotential, condition-number optimizing, length-weighted and smart Laplacian, Winslow elliptic. Mean ratio and edge length smoothing provided by MESQUITE, a mesh optimization toolkit by Argonne National Laboratory and Sandia National Laboratories.

Mesh refinement and scaling

Multiple methods for global or local conformal refinement with automatically generated transition elements per user specification, including pillowing and directional sheet operations to reduce or create anisotropy.

SCRIPTING

Powerful scripting & process automation for maximum simulation throughput

Replayable journal files

All GUI input is automatically echoed to the command line and saved as an editable, replayable journal file.

Python scripting

Scripting functionality is available directly via the command line with a built-in Python interpreter, or via file input for batch mode operation.

GUI and tool customization

Journalized command sequences and Python scripts can be launched with user-created, importable custom command buttons and toolbars.

Integration via SDK

Available SDK allows deep customization for seamless custom workflow integration via Python or C++.

