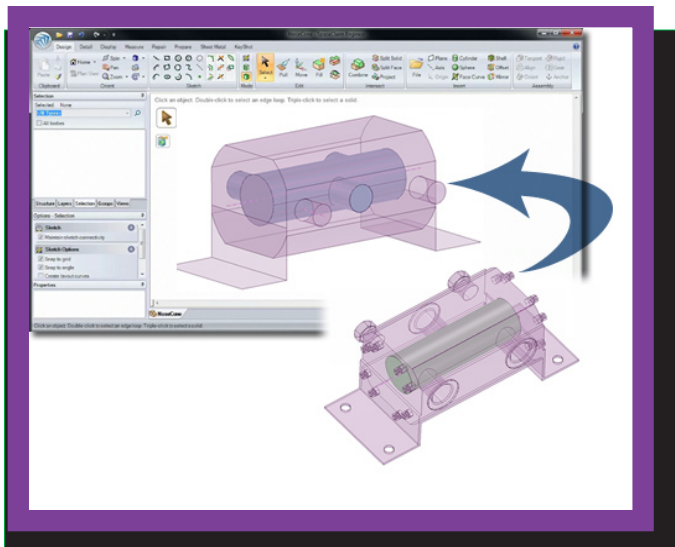


CRTech SpaceClaim is devoted to the preparation of CAD models for thermal analysis.



Geometry can be repaired and features not important to the thermal analysis can be removed, resulting in clean, thermal appropriate, meshes.

CRTech SpaceClaim® enables Thermal Desktop® users to import CAD parts and assemblies from virtually any CAD format (including STEP and IGES), simplify and heal the geometry, then send it to Thermal Desktop for meshing. New geometry can also be added using sketch-like Direct Modeling CAD technology, and the parts can be modified easily if the design changes.

CAD to CAE Bottlenecks

Parametric or history-based CAD modeling allows complex parts to be constructed algorithmically: a “recipe” is created by the designer. Such history-based modeling is extremely popular with designers, in part because the part construction often mimics manufacturing steps. Unfortunately, an analyst who inherits the design drawings must learn the CAD system and each part’s recipe well enough to “roll back” features such as chamfers and small holes that disrupt meshing, or that slow radiation and convection solutions.

The bane of the thermal engineer is receiving a detailed STEP or IGES file that cannot be defeatured, manipulated, or healed, and which often cannot even be closed as a solid. The addition of CRTech SpaceClaim to the process of preparing Thermal Desktop models provides revolutionary advantages over that prior state of the art.

Direct Modeling Technology

While driving dimensions can be specified parametrically in CRTech SpaceClaim, it is not a traditional history-based CAD system. Instead, it is a direct modeling system which is very easy to learn, use, and retain.

In a direct modeling system, geometric components are still accessible and organized in tree-like structures, but there is no recipe. It is perpetually analyzing the topology of the model and the intentions of the designer. In a nutshell, it recognizes and “understands” the geometry, rather than blindly following a recipe. Part dimensions and features can be changed directly, at any time, and in any order. Once recognized, features such as holes and fillets can either be retained or removed according to the thermal analyst’s needs.

Being easy to learn and use, the thermal analyst can use it to create their own



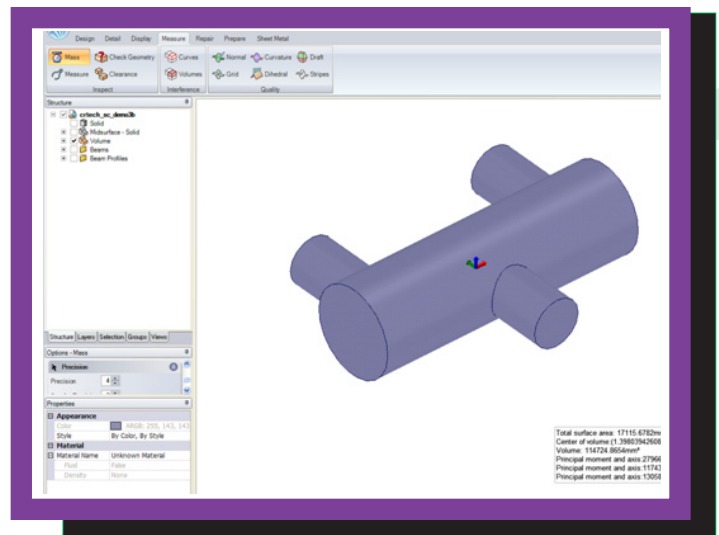
geometry. After all, creating an analysis model is not always a matter of subtracting or simplifying manufacturing geometry, but also adding what is not there ... enclosures, terrestrial planes and other environments, planes of symmetry, expendables (e.g., fuel or coolant), etc. Since the point of analysis is not just to verify a design but to adjust and optimize it, the ability of a thermal engineer to quickly modify a design, evaluating that variation, and then report any modifications to the design engineer is also valuable.

FEATURES

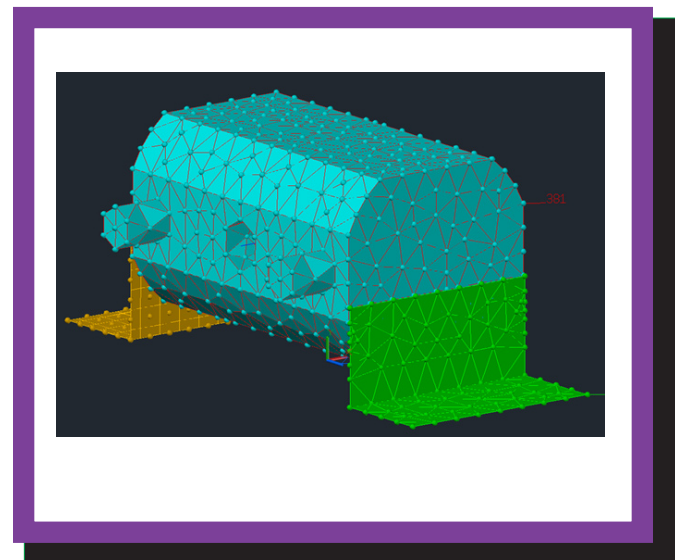
- **Import:** ACIS, STEP, IGES, EGAC, Rhinoceros, SketchUp, CGR, DWG, DXF, STL, OBJ, XAML, VRML, and 3D PDF (requires Adobe Acrobat 9 Pro Extended) • Optional Data Exchange Packages for: Pro/E, Inventor, CATIA, VDA, SolidWorks, Parasolid, NX, Adding/Modifying Geometry
- **Feature Recognition and Removal** • Fill, remove, combine, pull, extend • Recognize holes, fillets, rounds • Select similarly-sized features using power selection
- **Repair** • Identify and eliminate gaps and small faces • Identify and add missing faces • Identify and fix interference • Locate and correct split and inexact edges • Merge adjacent surfaces • Stitch surfaces into solid bodies
- **CAE Preparation** • Midsurfacing (2D from 3D) and Extending • Beam Extraction (e.g., centerlines for FloCAD®) • Volume Extraction and Enclosures (preparation for fluid flow modeling) • Imprinting and Splitting (to influence the mesh for mating faces, heaters, surface property variations, etc.) • Simplify into planes, cones, cylinders (perhaps for Thermal Desktop snap-on scaffolding)
- **Optional module: Mesh Generation for SpaceClaim** provides even more modeling power, including advanced meshing and thermal analysis preparations that are automatically updated if the geometry changes.

A Unique Focus on CAE

Only one direct modeling tool has dedicated itself to CAE model preparation as a primary market: SpaceClaim Engineer. This is why C&R Technologies selected it as the basis for CRTech SpaceClaim, which offers extensions specific to thermal/fluid engineering.



In preparation for import to Thermal Desktop, volumes, centerlines, and midsurfaces can be extracted. Imprinting can be used to influence subsequent mesh boundaries.



Resulting geometry can be imported into Thermal Desktop and meshed.

C&R TECHNOLOGIES®

Phone 303.971.0292

Facsimile 303.971.0035