Providing Intelligent Integration Between FloTHERM® and FloMCAD™ Bridge
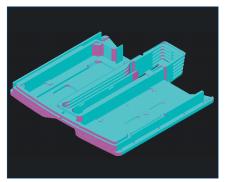
FloMCAD Bridge from Mentor Graphics enables parts and assemblies from Mechanical Computer Aided Design (MCAD) software (such as Pro/Engineer, Solid Works, CATIA, etc.) to be transferred easily and rapidly to and from FloTHERM for thermal analysis.
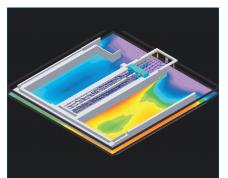
FloMCAD Bridge is more than just an interface program - it intelligently filters the geometrical data for a particular part or assembly and creates a simplified "thermal equivalent" for analysis purposes. This is critical because production quality MCAD solid models contain a vast amount of thermally insignificant geometric detail. Simply importing the geometry from the MCAD system can create a thermal analysis problem so complex that it will take weeks to solve. A wiser approach is to simplify the geometry to a level that matches the thermal importance of the part, e.g. little or no simplification for thermally critical geometry, a lot of simplification for small or passive geometry. A few minutes spent simplifying the problem can save days or weeks later.

FloMCAD Bridge is a productivity tool designed to help the engineer speed up and automate the simplification process leading to greater productivity and faster turnaround in thermal analysis.

Normally the MCAD part geometry includes radii, fillets, draft angles, small holes and other features which are not important from a thermal standpoint, but which greatly increase the complexity and time required for thermal analysis if included in the simulation. Using FloMCAD Bridge, the user can identify and remove unnecessary geometrical features such as non-planar surfaces, blends, fillets, small holes and protuberances, while preserving volume or surface area as appropriate. FloMCAD Bridge then "dissects" (converts) the part automatically into FloTHERM primitives and transfers it to FloTHERM.

Chassis geometry - CAD model

Chassis geometry pre-processed by FloMCAD Bridge and analyzed in FloTHERM

Alternatively a one-touch operation can both simplify and then dissect the model using a slider bar to set the simplification level. This method, called "decomposition", provides a near instantaneous conversion capability for seamless integration with MCAD environments.
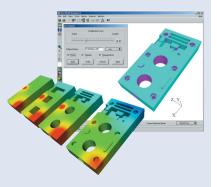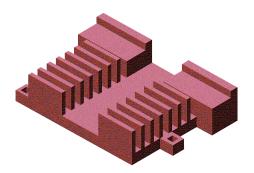
Customer Testimonial:

" FloTHERM is of crucial importance to us in understanding and optimizing the different heat transfer paths and mechanisms between electronic components and the ambient surroundings in the harsh environmental conditions found in aircraft. We use FloMCAD Bridge to simplify our original mechanical CAD files and quickly create computational models for the simulations. The way FloTHERM represents electronic components is a key advantage, enabling us either to use simple thermal data from component datasheets or switch to detailed 3D models for critical components when necessary. "

*Jorge Giménez Romo,
Hardware Engineer, Tecnobit*

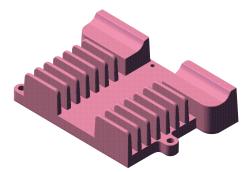## The Decomposition Process:

The MCAD geometry file is converted to an ACIS solid on import into FloMCAD Bridge. A desired simplification level is set on a slider bar, appropriate for the level of detail required. The model is then simplified, converted into FloTHERM objects and transferred to FloTHERM in a single operation.

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Simplified heatsink as represented in FloTHERM

A heatsink generated in Pro/ENGINEER

FloMCAD Bridge – KEY FEATURES

Part and Assembly import from all major MCAD tools

- Native files from ProEngineer, Solidworks, and Catia can be imported directly into FloMCAD Bridge. Neutral file formats, including ACIS, STEP, IGES, STL, and DXF, can also be read. This MCAD data flexibility ensures that you can incorporate your solid geometry data in your FloTHERM designs regardless of the MCAD tool in use at your organization.

Automatic, Intelligent Geometry De-featuring

- Typically, there are many geometric features in production quality MCAD designs that are thermally irrelevant. Inclusion of chamfers, fillets, screw threads, and other small features in a FloTHERM calculation do nothing to improve the prediction of temperatures, but will have a large impact on solution times. FloMCAD Bridge has many intelligent, automated geometry simplification capabilities that screen out small features to ensure that the thermal representation of the part is accurate and the calculation time remains quick.

Transform solid geometry directly into SmartParts

- Any solid part, feature, or collection of faces can be transformed directly into a parametric FloTHERM SmartPart. SmartParts improve model setup time, parametric analysis and optimization efficiency, and include many thermal modeling methodologies specific to the electronics cooling industry. SmartPart types include enclosures, perforated plates, printed circuit boards, axial fans, and more, allowing you to add thermal intelligence to the MCAD geometry as it's being imported to FloTHERM.

For the latest product information, call us or visit: w w w . m e n t o r . c o m / m e c h a n i c a l

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