

Providing Intelligent Integration Between FloTHERM and FloMCAD^{Bridge}

MECHANICAL ANALYSIS
Electronics Thermal

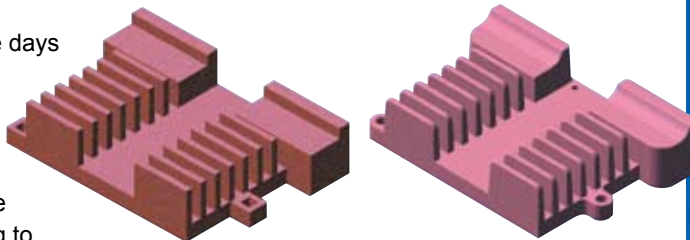
FloMCAD^{Bridge} from Mentor Graphics enables parts and assemblies from Mechanical Computer Aided Design (MCAD) software (such as Pro/Engineer, Solid Works, CATIA, etc.) to be transferred easily and rapidly to and from FloTHERM for thermal analysis.

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.

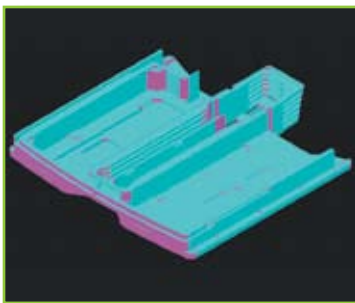
FloMCAD^{Bridge} is a productivity tool designed to help the engineer speed up and automate the simplification process leading to greater productivity and faster turnaround in thermal analysis.

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.

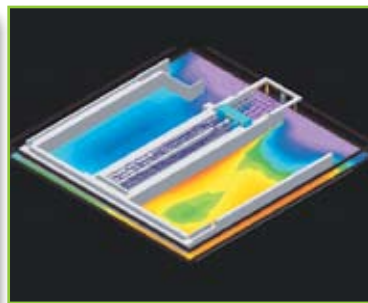
Alternatively a one-touch operation can both simplify and then dissect the model using a slider bar to set the simplification level. This method, called "decomposition", provides a near instantaneous conversion capability for seamless integration with MCAD environments.



Left: A heatsink generated in Pro/ENGINEER
Right: Simplified heatsink as represented in FloTHERM



Chassis geometry - CAD model

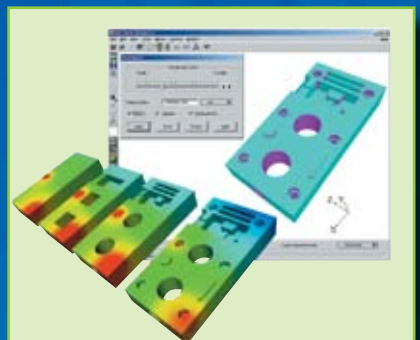


Chassis geometry pre-processed by FloMCAD^{Bridge} and analyzed in FloTHERM

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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