

POWERFLOW FOR AVIONICS COOLING



3DEXPERIENCE®

Thermal Simulation of Avionics Compartments

Technical Challenges

Thermal management is the main issue affecting the design and configuration of an avionics compartment. Avionics components must operate within the required temperature limits under all operating conditions — typically in very confined spaces with little cooling airflow.

SIMULIA Solution

SIMULIA has a comprehensive solution for avionics thermal management. PowerFLOW's highly accurate transient simulation of the cooling flows within the avionics compartment is automatically coupled with PowerTHERM to predict heat conduction and radiation. The ability to quickly access and reconfigure different components in PowerFLOW enables you to optimize the avionics compartment configuration to achieve maximum cooling efficiency. You can model components in their full complexity, or in a simplified way if geometric data are not yet available. You can model heat sources effectively. In addition, PowerFLOW's rotating geometry capability enables you to accurately model fan performance and efficiency.

Using the SIMULIA solution for avionics cooling, you can:

- Estimate thermal performance ranges for a wide range of airplane operating conditions.
- Improve the design of avionics compartments for better efficiency.
- Rapidly analyze various packaging concepts against thermal operating ranges and the trade-offs with other requirements.