

NX Advanced Thermal

fact sheet

Siemens PLM Software

www.siemens.com/nx

► Summary

NX™ Advanced Thermal software extends the modeling and simulation capabilities of NX Thermal or NX Electronic Systems Cooling. The NX Advanced Thermal solver provides a wide range of methods for advanced radiation analysis, radiative and electrical heating models, advanced materials models such as phase change, charring and ablation, as well as one dimensional hydraulic network modeling. Thermo-fluid coupling is enabled with NX Flow and NX Advanced Flow, and thermo-elastic effects can be simulated by mapping temperature results to NX Nastran®.

Benefits

Quickly move from NX CAD assembly to thermal simulation results

Perform rapid what-if scenario investigations even for complex thermal analysis problems

Reduce product design risk through high fidelity thermal simulation

Features

Advanced heat transfer models for radiation and electric heating

Parallel radiation solver provides solution efficiency

Advanced material models including phase change

One-dimensional hydraulic network modeling

NX Advanced Thermal adds a rich feature set to the powerful simulation technology of NX Thermal. Intended for tackling complex thermal physics and challenging thermal management problems, NX Advanced Thermal offers the same best-in-class level of integration within the NX pre-, post- and simulation tools.

Applications of NX Advanced Thermal include simulation and analysis of a range of heat transfer problems in automotive, electronics, power, process, and other industries. NX Advanced Thermal offers the following additional features on top of the NX Thermal license:

Advanced optical properties

- Specular reflectivity, diffuse and non-diffuse transmissivity, index of refraction, solid absorption
- Direction-dependent optical properties, BRDF
- Wavelength-dependent properties for nongray analysis

Advanced material models

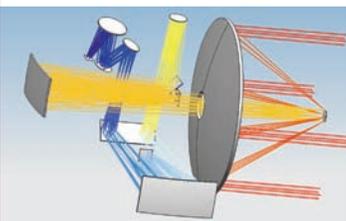
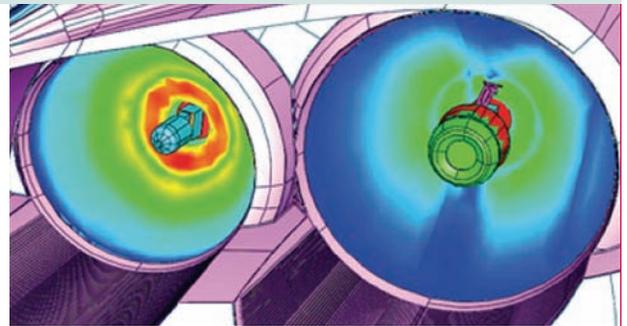
- Ablation, and charring models
- Electrical resistivity and Joule heating

Advanced radiation methods

- Deterministic and Monte Carlo ray tracing
- Nongray multiband radiative heat transfer

Radiative heating

- Solar heating with atmospheric and albedo flux models
- Radiative source definition, collimated or diffuse, spectrum dependent, time and spatially varying flux



1-D hydraulic network modeling

- 1D flow modeling using duct networks
- Simulate convection to and from 1D duct networks

Advanced thermal couplings

- Join
- One-way heat transfer
- Free and forced correlation-based convection couplings
- User-defined couplings

Articulation and motion modeling

- Any combination of translational motion and rotational joints
- Time dependent radiation and thermal couplings
- Post processing of articulated mesh

Thermal control devices

- Peltier cooler models
- Active heater controllers, PID controllers

Open architecture

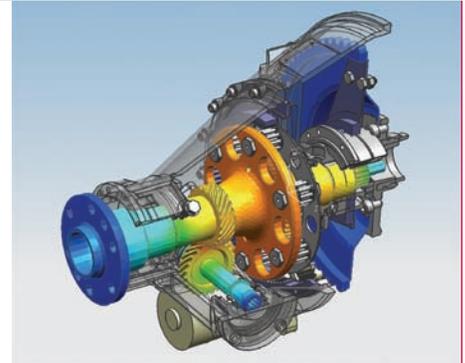
- Full access to thermal system equations
- Incorporation of external models
- Enhanced solution control

Parallelized radiation solver

- Distributed memory (MPI) based parallelization for highly scalable computation of view factors and radiative heating
- Applicable to multicore, network and cluster architectures

Supported hardware/OS

NX Advanced Thermal is an add-on module in the NX Advanced Simulation suite of applications. It requires a license of NX Thermal as a prerequisite. All standard NX hardware/OS platforms are supported (including Windows, Linux and selected 64-bit platforms). Contact Siemens for any other specific hardware/OS support requests.



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