Explore the full possibilities of time-saving, cost-effective product design optimization with INTEGRATED Engineering Software’s thermal analysis tools. KELVIN (2D/RS) and CELSIUS (3D) are the thermal solution tools in our combined physics set. Get the complete electromagnetic-thermal solution of your device by combining electromagnetic power loss input and thermal analysis.

Our proprietary Boundary Element Method (BEM) solver technology provides extremely accurate numerical field solutions and it’s the method of choice for problems involving the modeling of space around the device. The Finite Element Method (FEM) solver is incorporated in the program as well to provide users with the choice of both methods.

Engineers and scientists depend on KELVIN and CELSIUS for coupled thermal/electromagnetic applications including:

- electronic packaging
- electric power components
- appliances
- busbars
- automotive components
- cooling fins
- aerospace components
- heat sinks

WE GO BEYOND TRADITIONAL MULTIPHYSICS:

- Search-based 2D/RS & 3D transient and static thermal field solvers for a diverse range of applications.
- Metaheuristic approach for optimizing simulation based electromagnetic designs.
- Precise analysis of open region problems using our proprietary Boundary Element Method (BEM) solvers.
- Finite Element Method (FEM) in addition to BEM. This hybrid approach uses the strength of each method while designing an electromagnetic system.
- Built-in API, Parametric and/or Scripting capabilities

The INTEGRATED API enables the direct control of program functions by utility scripts or macros created in tools such as EXCEL or Visual Studio. Scripting can control the entire process of model creation and testing.

- Transparent multiphysics coupling
- Direct import of models from CAD partners including: Autodesk, PTC, Solid Edge and SolidWorks.

MORE BENEFITS:

- Easy-to-use and intuitive interface.
- High resolution 3D graphic representations that can show enhanced tracing of points on model.
- World class support team ready to unlock your ideas.
For many systems, it is important for multiple solvers to be combined. INTEGRATED develops comprehensive solutions for scientists modeling prototypes that require multiphysics analysis.

"KELVIN has became an important tool in the education of our students: INTEGRATED’s programs are easy to learn and easy to use. The parametric calculations are a key feature in the software."

— Dr. Josef Hodapp
FACHHOCHSCHULE AACHEN

Visualize, Analyze, Optimize

Both KELVIN and CELSIUS provide outstanding visualization features for detailed analysis of thermal systems. Automated model creation using built-in API and Parametric Utilities combined with Self-Adaptive solvers enable rapid optimization of designs.

3D model of high voltage bushing showing temperature contours

Temperature contours inside a copper sphere with uniform volume heat

KELVIN and CELSIUS come complete and ready to use. Purchase of additional modules or options is not needed; KELVIN and CELSIUS are fully functional CAE tools. A partial list of standard features includes:

- Display of temperature, temperature gradient and heat flux using contour plots, surface representations and graphs
- Easy assignment of boundary conditions in terms of temperature, heat flux, temperature gradient, convection and radiation
- Assignment of heat sources in form of volume heat and surface heat
- Large materials library. Materials with thermal conductivity, specific heat and mass density values can be easily added in materials table
- Batch processing that allows for unattended solution of multiple files
- Powerful parametric feature which allows definition of variable parameters to be stepped through, allowing the analysis of multiple “what-if” scenarios and facilitating design optimization
- A wide array of post processing options for design evaluation and optimization
- Self adaptive meshing or optional user refinement
- CAD healing utilities for automatic correction of drafting errors
- Periodic and symmetry features to minimize modeling and solutions time

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