January 2002

HEAT3

Version 4.0

Heat conduction in three dimensions

HEAT3 is a PC-program for three-dimensional transient and steady-state heat conduction. Typical applications are analyses of thermal bridges, heat transfer through corners of a window, heat loss from a house to the ground, surface temperatures for condensation risk, and fire safety design. The program is along with the two-dimensional version HEAT2 used by more than 80 universities and research institutes worldwide. The program is validated against the standard EN ISO 10211-1.

Features

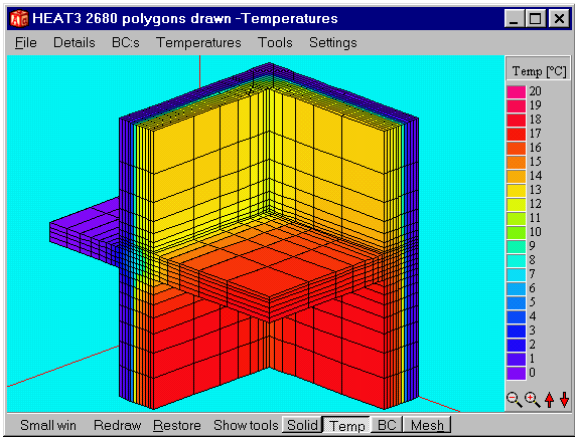
- Well tested and well documented. Outstanding numerical performance. One million nodes may be used in the standard version. Code optimizations are made for Pentium 2, 3, and 4 processors. The figures to the right show the calculation time for a Pentium 3.
- Integrated graphical pre-processor. Extensive graphical capabilities: figures showing geometry, numerical mesh, boundary conditions, temperatures and heat flows can be rotated in space, and details of particular interest can be enlarged.
- Any structure consisting of adjacent or overlapping parallelepipeds with any combination of materials may be simulated.
- Boundary conditions may be a given heat flow, or a temperature with a surface resistance. Temperatures may vary in time (sinusoidal, stepwise constant, stepwise linear). Several formats with climatic data such as TRNSYS, DOE, METEONORM, HELIOS, TMY2, SUNCODE, MATCH, and EXCEL can be imported for dynamic calculations.
- Heat sources/sinks are available.
- Extensive material database with 1200 materials. There is also a separate list that contains 200 materials from the German standard DIN V 4108-4. Material properties may easily be edited and added.

Requirements

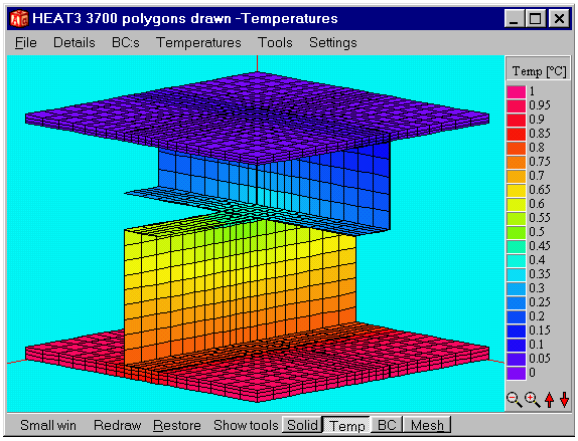
HEAT3 requires a PC running Windows 95/98/NT/2000/XP with 32 MB RAM (125 000 nodes). One million nodes require 64 MB. A special version with 50 million nodes requires 2 GB RAM.

Developers

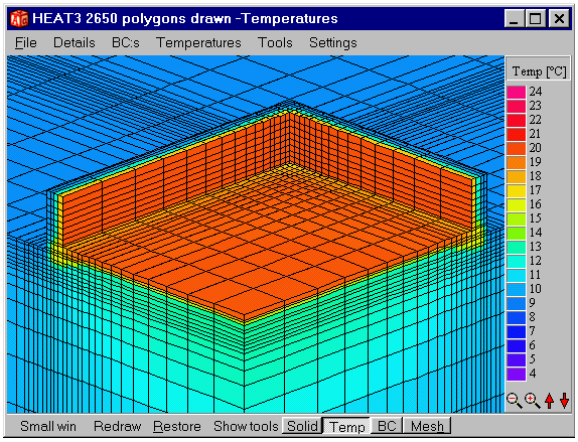
Lund Group for Computational Building Physics, Dept. of Building Physics, Lund University, Sweden.
Order info: www.buildingphysics.com, email: info@blocon.se



This EN ISO 10211-1 test case takes a second to solve (Pentium 3).



Cross-laid steel studs inside insulation between gypsum board (the insulation is not shown here). This problem with 12000 numerical nodes takes a couple of seconds to solve (Pentium 3).



This quarter of a slab on the ground with 25000 numerical nodes takes about 10 seconds to solve (Pentium 3).