

What's new in HEAT3 version 5

Blocon is proud to present a new version of HEAT3. It has been four years since version 4 was released and many new important features have been added. Up-to-date information is given on www.buildingphysics.com and www.buildingphysics.de (in German).

Automatic mesh generation

HEAT3 can automatically perform steady-state calculations with gradually refined meshes. The user does not have to think about how to give a proper mesh - HEAT3 does this. The mesh criterion from EN ISO 10211 can be applied.

Thermal coupling coefficient analyses

HEAT3 automatically calculates the thermal coupling coefficients (L^{3D}) according to EN ISO 10211 for a wide variety of problems involving thermal bridges.

Post-processing in 2D and 3D

The post-processing features have been extended. Charts for temperatures, isotherms, extended heat flow plots, and heat flow arrays are available. A new 2D post-processor (similar to the one in HEAT2 6.0) has been developed.

Faster calculations

The relaxation coefficient is now optimized during the calculation. As an extreme example, a slab on the ground problem with 570 000 nodes took 100 seconds to solve with optimization. Without optimization this calculation needed 640 seconds when the default value for the relaxation coefficient of 1.95 was used.

The time for steady-state calculations is lowered by 20-50% for most cases. This optimization is made by default but can be turned off (menu item *Solve/Options for steady-state*).

Movie Maker

The Movie Maker captures graphical output data (2D and 3D), such as temperatures, isotherms, and heat flows and makes a standard AVI-file.

Temperatures and heat flows along lines

It is now possible to draw lines in the pre-processor and chart the temperatures (or heat flow intensities) along the lines.

Report Generator

The Report Generator produces on-the-fly a printable document with optional text and figures with project info, and input/output data.

Enhancements in the material list

The material list is now searchable. Thermal properties may be shown in the material pick list after the material name. It is possible to have a hierarchical structure with two levels for the material list. Material files (*.mtl) are compatible and sharable with HEAT2 version 6.

Batch jobs

Multiple consecutive simulations may be started externally via batch files.

Increased sizes for data fields

Many data fields have been increased in sizes. The maximum number of numerical nodes has been doubled from 1000000 (100·100·100) to 2197000 (130·130·130) in the standard version.

HEAT3 5.0 with 2.2 million nodes requires only about 80 MB RAM (a pc with 256 MB is recommended), and less than 5 MB hard disk space. The input data file sizes (*.H3P) are as usual only a few kB large.

The maximum number of polygons (each cell that is adjacent to a boundary) that can be showed in the post-processor is extended from 50000 to 80000.

Special versions of HEAT3 with huge array sizes (e.g. 50 million nodes which needs 1.6 GB ram) are available, see homepage.

Other changes

Hundreds of minor improvements are made. The most important are shown below:

- Enhancements in pre-processor
- Desktop (placement and sizes of windows) may be saved/read (menu item *Options*)
- Estimation of better heat flows based on calculations with different meshes
- New routines for interpolation of temperatures with higher accuracy
- Export data for graphs in different formats (text, Excel, HTML, XML, Metafile, bitmap)
- Toggling from HEAT3 4.0 to another program and back again would sometimes close down several windows in HEAT3. This is now fixed.
- The chart window for the recorder can now show multiple graph lines in the same chart.
- Improved generation of expansive meshes: the expansion in each direction is made so that the smallest cell has the same size in all three dimensions (the smallest cell will have the shaped of a cube).

Enhancements in post-processing:

- Window content may be zoomed to a much higher limit than before
- Faster drawing/updating
- Color plots (in 2D and 3D) of heat flow can be viewed for different direction components (perpendicular to surface (q_z), along surface (q_x, q_y), or for all directions (q_x, q_y, q_z))