

Problem info

Problem type: Steady-State Heat Transfer

Geometry model class: Plane-Parallel

Problem database file names:

- Problem: *slot_heating.pbm*
- Geometry: *Slot_heating.mod*
- Material Data: *Slot_heating.dht*
- Material Data 2 (library): *none*
- Electric circuit: *none*

Results taken from other problems:

- *none*

Geometry model

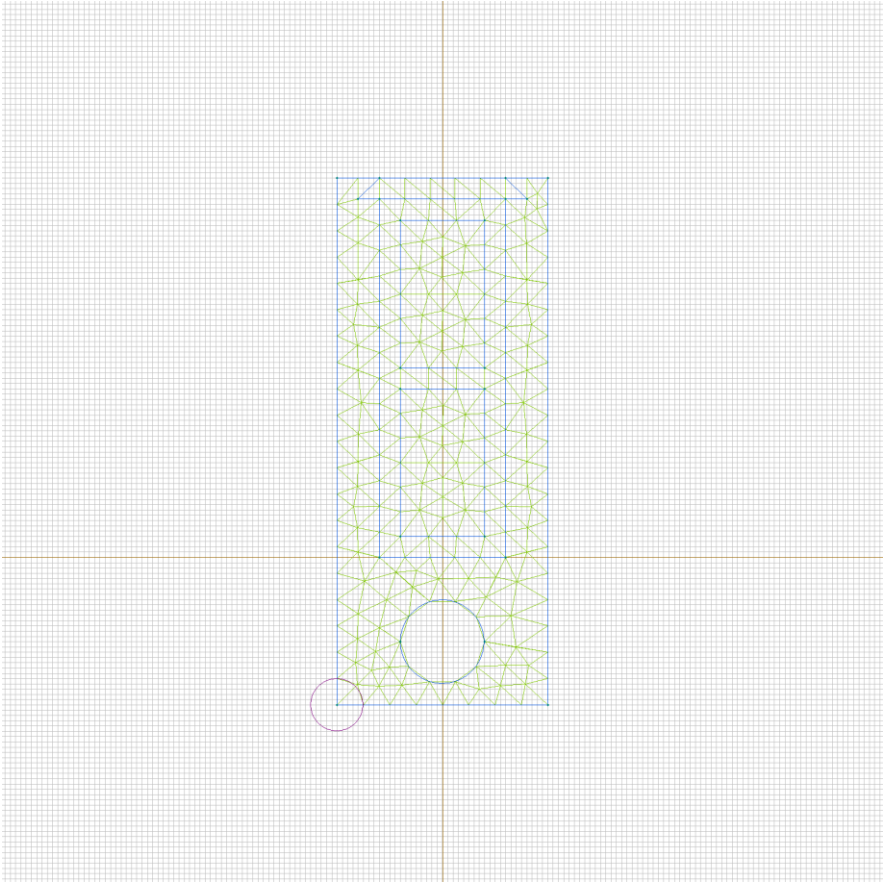


Table 1. Geometry model statistics

	With Label	Total
Blocks	4	6
Edges	4	24
Vertices	0	22

Number of nodes: 232.

Labelled objects

There are following labelled objects in the geometry model (Material Data file could contain more labels, but only those labels that assigned to geometric objects are listed)

Blocks:

- [insulation](#)
- [conductor](#)
- [wedge](#)
- [steel](#)
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Edges:

- [symmetry](#)
- [inner surface](#)
- [outer surface](#)
- [cooling duct](#)
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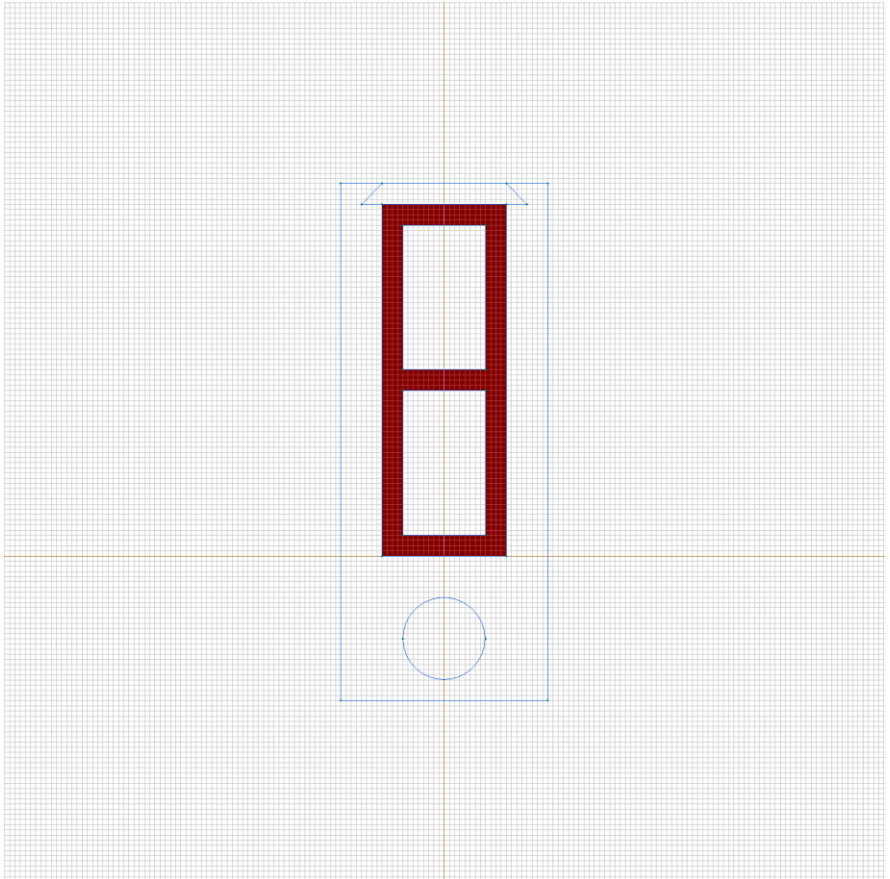
Vertices:

Detailed information about each label is listed below.

Labelled objects: block "insulation"

There are (1) objects with this label

Thermal conductivity: $\lambda_x=0.15$ [W/(K*m)],
 $\lambda_y=0.15$ [W/(K*m)]



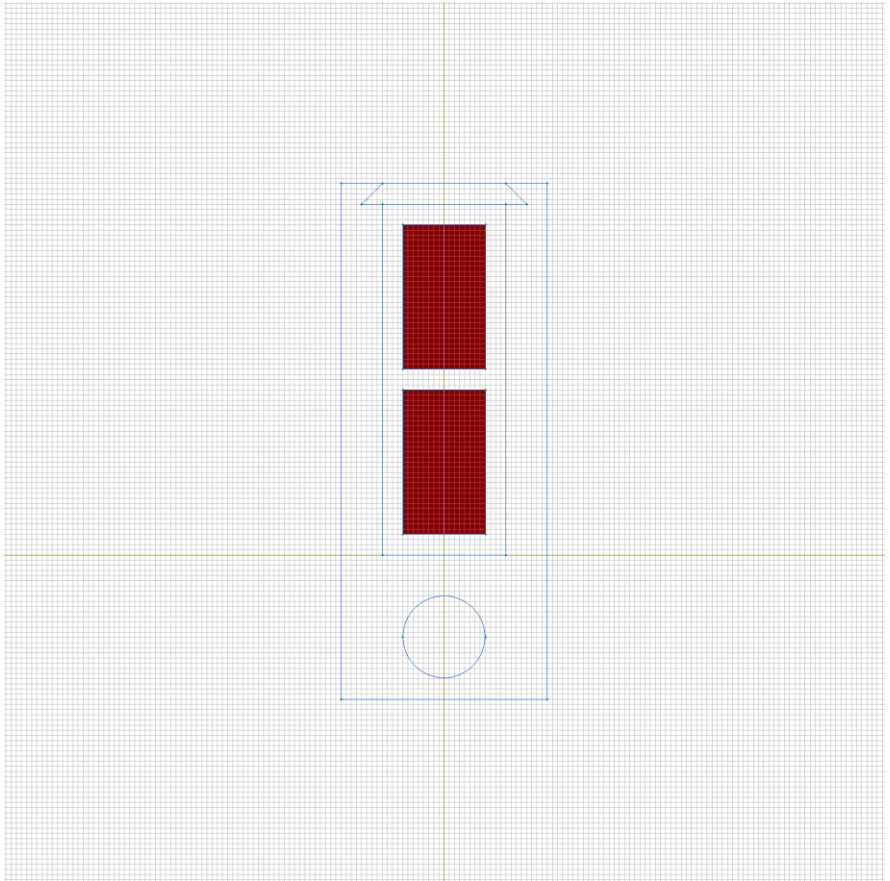
Labelled objects: block "conductor"

There are (2) objects with this label

Thermal conductivity: $\lambda_x=380$ [W/(K*m)],

$\lambda_y=380$ [W/(K*m)]

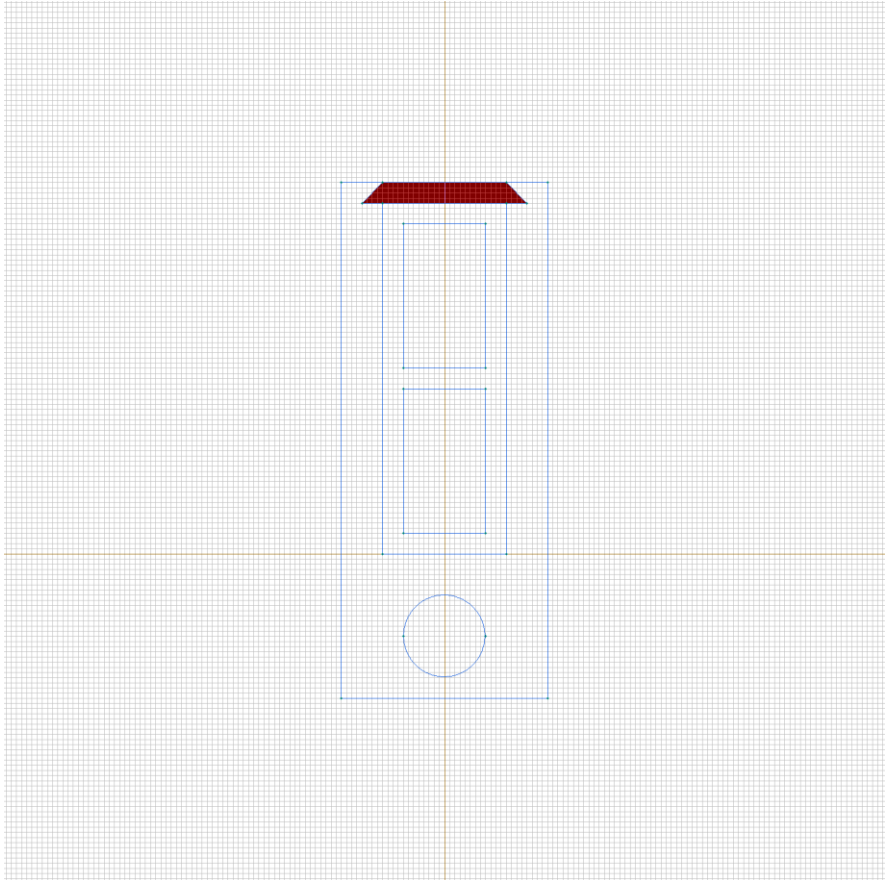
Volume heat: $Q=4.5e6 * 4.5e6 / 56e6$ [W/m³]



Labelled objects: block "wedge"

There are (1) objects with this label

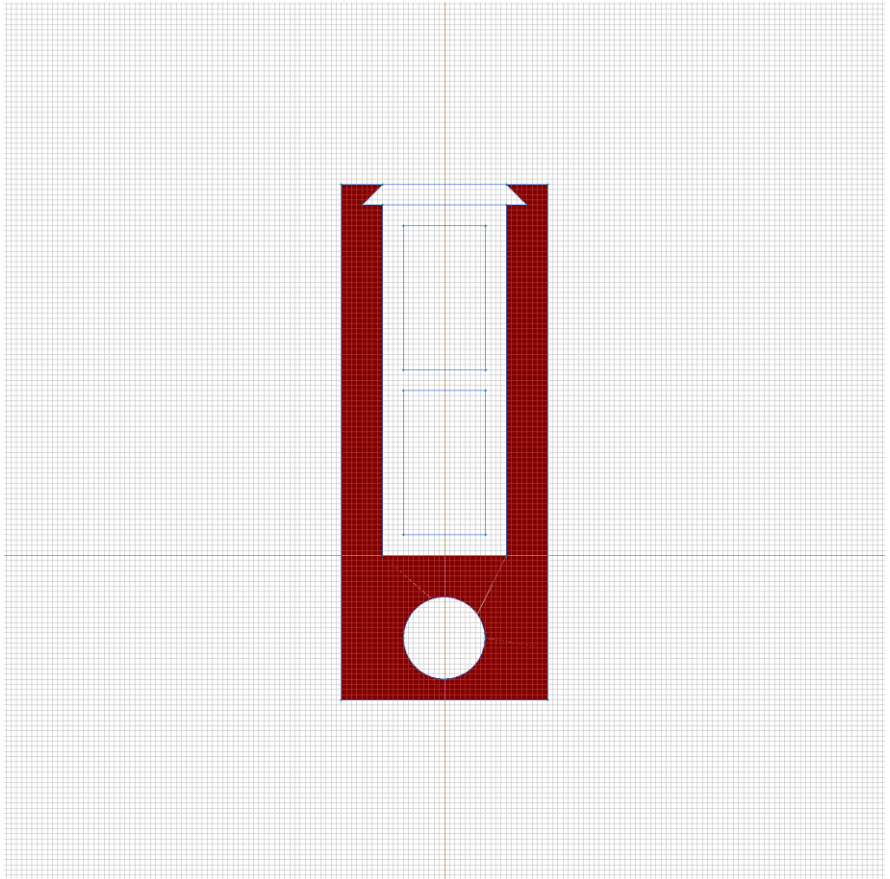
Thermal conductivity: $\lambda_x=0.25$ [W/(K*m)],
 $\lambda_y=0.25$ [W/(K*m)]



Labelled objects: block "steel"

There are (1) objects with this label

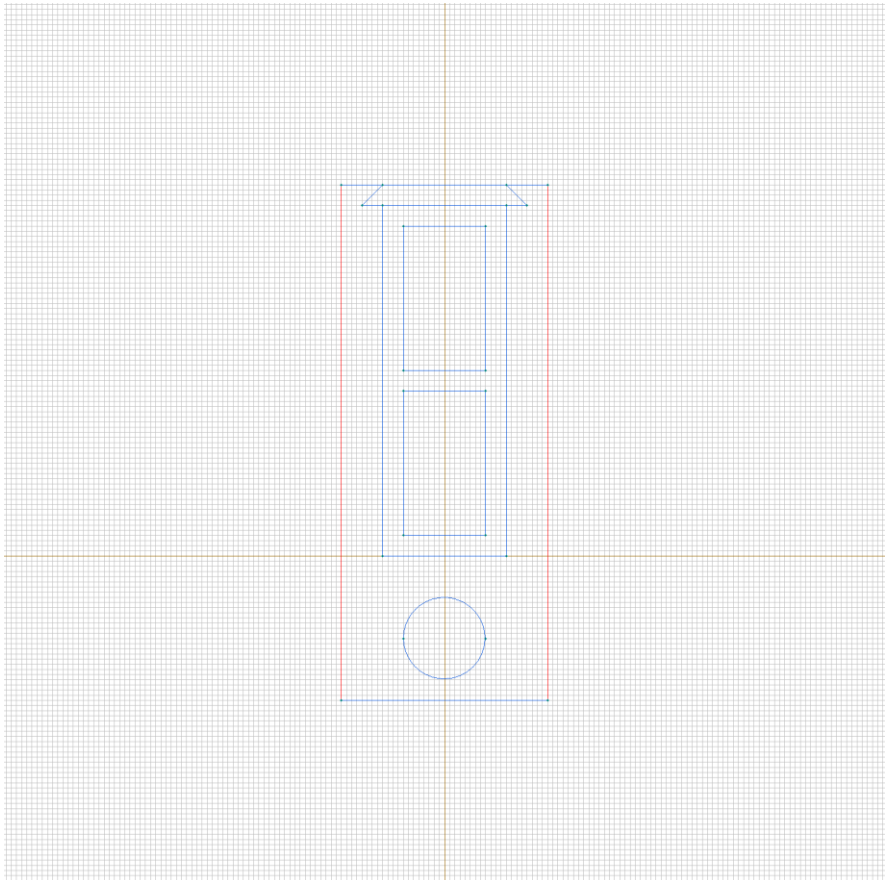
Thermal conductivity: $\lambda_x=25$ [W/(K*m)],
 $\lambda_y=25$ [W/(K*m)]



Labelled objects: edge "symmetry"

There are (2) objects with this label

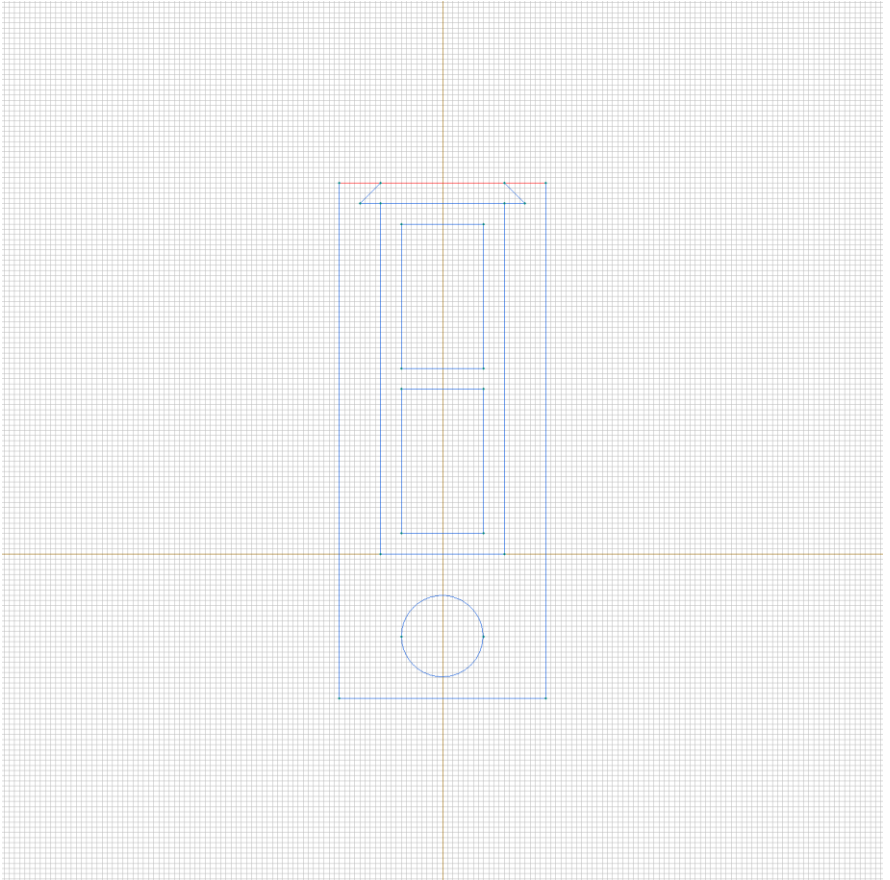
Heat flux: $F=0$ [W/m²]



Labelled objects: edge "inner surface"

There are (3) objects with this label

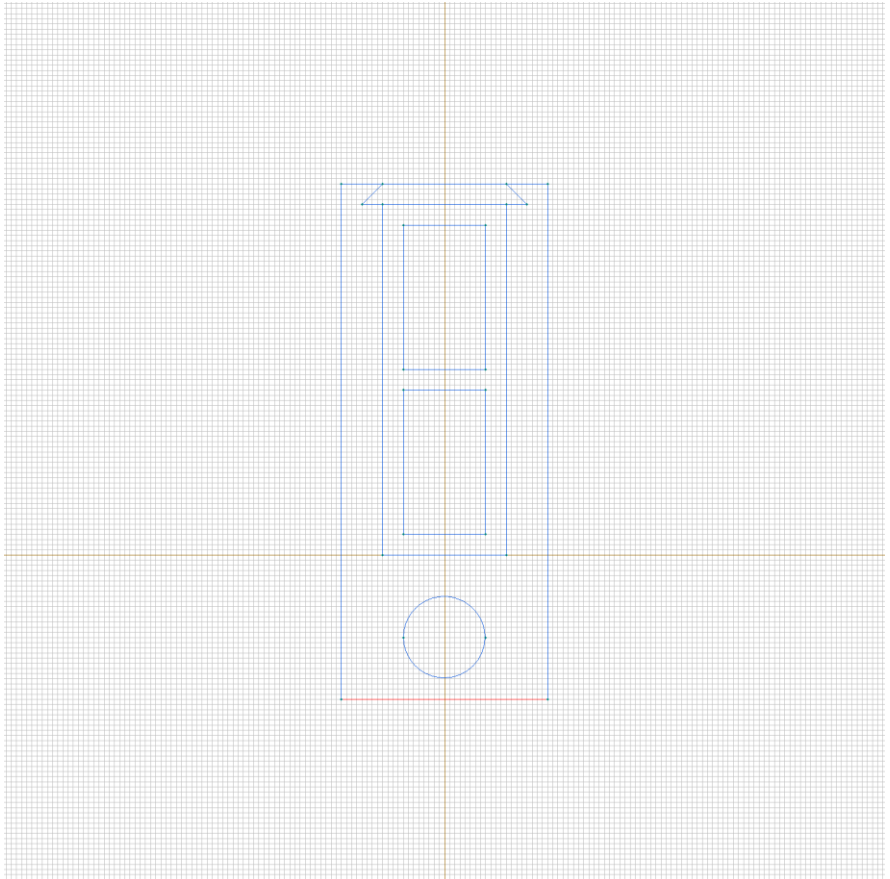
Convection: $\alpha=150$ [W/(K*m²)], temperature $T_0=-233.15$ [K]



Labelled objects: edge "outer surface"

There are (1) objects with this label

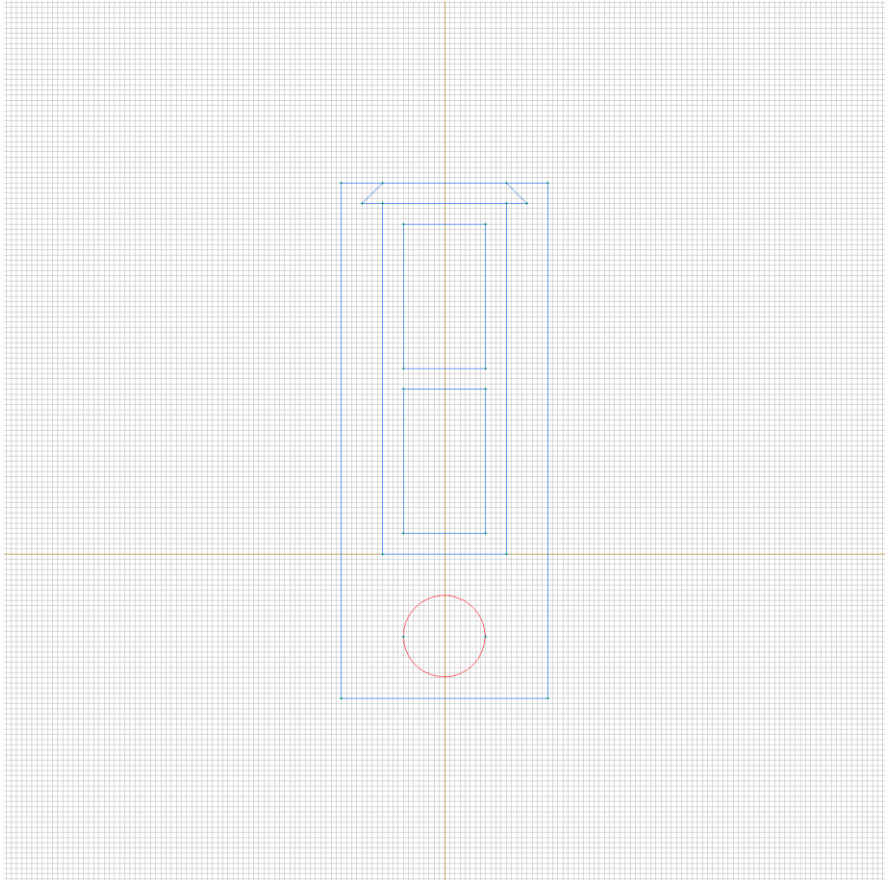
Convection: $\alpha=20$ [W/(K*m²)], temperature $T_0=-253.15$ [K]



Labelled objects: edge "cooling duct"

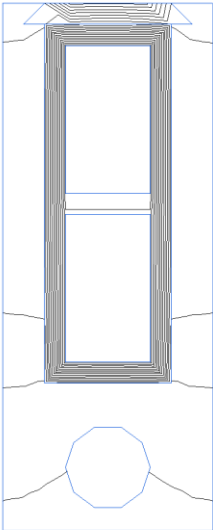
There are (2) objects with this label

Convection: $\alpha=100$ [W/(K*m²)], temperature $T_0=-233.15$ [K]



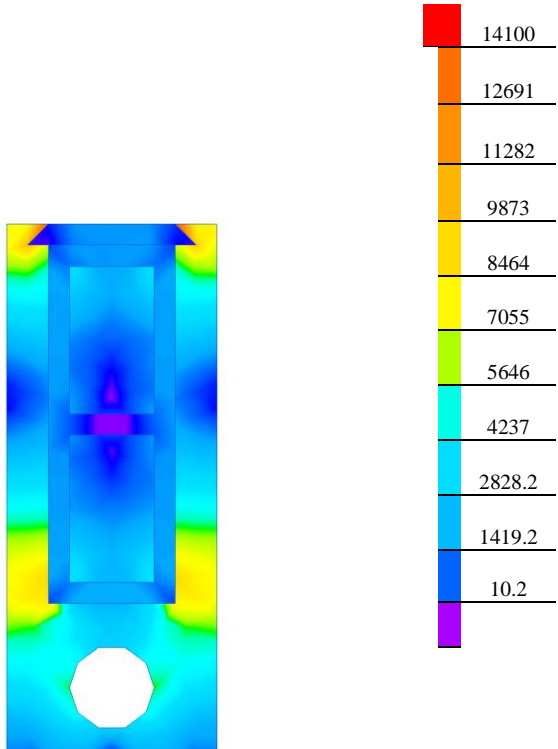
Results

Field lines



Results

Color map of Heat flux |F| [W/m²]



Nonlinear dependencies

No non-linear dependencies are used in this problem data