Calculation of thermal properties:

Product: **POROTHERM HP 200 TB**

Destination country :	India
Methode:	numerical simulation
Software:	THERM Finite Element Simulator Version 6.3 Lawrence Berkeley National Laboratory UNIVERSITY of CALIFORNIA, Berkeley 2003
Calculator:	Dipl.Ing. Michael Kogler

Calculation is performed according the following standards:

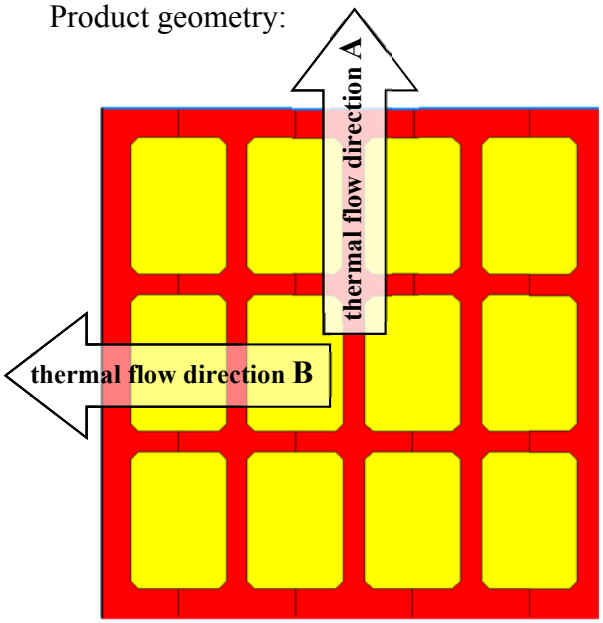
ISO 6946:1996, *Building components and building elements — Thermal resistance and thermal transmittance — Calculation method (ISO 6946:1996)*

ISO 7345, *Thermal insulation — Physical quantities and definitions (ISO 7345:1987)*

ISO 10456, *Building materials and products —Products for determining declared and design values (ISO 10456:1999)*

EN 1745 *: Masonry and masonry products — Methods for determining design thermal values*

1. Product geometry:



Dimensions:

Length:	400 mm
Thickness:	200 mm
Height:	200 mm

Voids ratio: 57,5 %

All voids filled with mineral wool

2. material data:

The thermal properties are defined for the dry state, at a temperature of 10°C ;
propability : p=50% acc. EN1745

	density	ceramic thermal conductivity: $\lambda_{10,dry,material}$
	[kg/m³]	[W/mK]
Ceramic body	1920 ± 20	0,47 ± 0,05
Mineral wool	115 ± 10	0,037 ± 0,02

3. boundary conditions:

3.1. internal and external surface resistance in m^2K/W according to EN ISO 6946:

$R_{si} = 0{,}13\ m^2K/W$

$R_{se} = 0{,}04\ m^2K/W$

3.2. internal and external temperatures in °C:

$T_i =$ 24 °C

$T_e =$ 45 °C

} *average temperature in product = 34,5 °C*

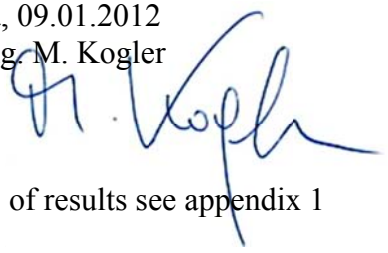
4. results calculated:

	U-value of the product [W/m²K]		
	min *)	max *)	average
thermal flow direction A	0,672	0,711	0,692
thermal flow direction B	0,607	0,632	0,619

**) The differences between min. and max. U-values are caused by the numerical stability of the simulation and the accuracy of equation solving algorithms.*

U-values for ceramic densities not corresponding with the calculated values may be linearly interpolated.

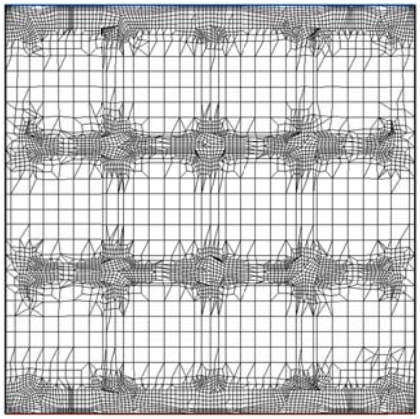
Vienna, 09.01.2012
Dipl.Ing. M. Kogler



Graphs of results see appendix 1

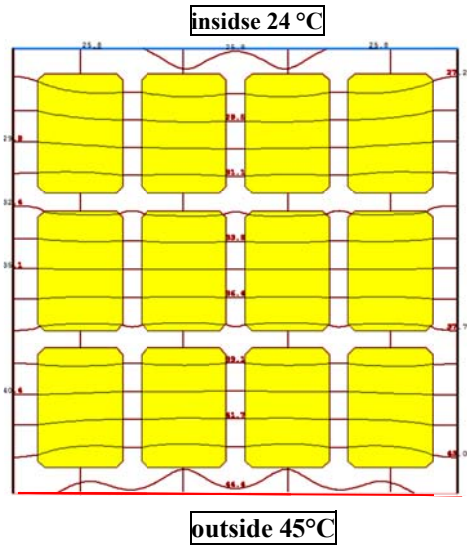
Appendix 1:

Finite element mesh:

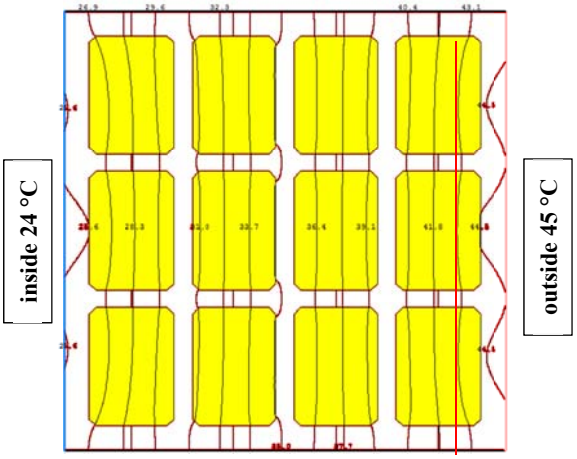


Picture of isotherms:

thermal flow direction A



thermal flow direction B



Thermal flux through the product: