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VTT, Expert Services

Determination of the thermal conductivity, λ_{10} , and the thermal resistance, R , of the ProVent underflooring of the parquet

Requested by: SIA PEPI RER Ltd

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Order E-mail 18th November 2008 / Helmut Wiemers

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Task **Determination of the thermal conductivity, λ_{10} , and the thermal resistance, R, of the ProVent underflooring of the parquet**

Sample The manufacturer delivered one roll of products ProVent underflooring to VTT. The size of the sample was about 1280 mm x 4200 mm.
The samples were received on 14th November 2008.

Performance of the task *Test method*

The tests were done according to the standard EN 12667: "Building materials - Determination of thermal resistance by means of guarded hot plate and heat flow meter methods - Products of high and medium thermal resistance".

The apparatus used are in accordance with the standard ISO 8301: "Determination of steady-state thermal resistance and related properties - Heat flow meter apparatus".

The identifications of apparatus used are: HFM1: 1022388 and HFM2: 9001369.

The test method was one specimen asymmetrical. The specimen was in vertical position and the heat flow was horizontal during the test.

The edge heat losses were minimized keeping the ambient temperature of the environment around the apparatus at the mean temperature of the test.

The calibration of the apparatus was carried out using Certified Reference Material IRMM-440 nr.19 (4th December 2001) as a reference material.
The calibrations were done at intervals of two weeks.

The thickness of the product was measured under 250 Pa load.

The thermal resistance of the underflooring ProVent was calculated using formula; $R=d/\lambda$, where d is the average thickness (m) of the product.

Test specimens

Pieces of size 400 mm x 400 mm were cut from the sample. The specimen was made piling up 12 pieces. The aim was to reach the thickness of the specimen required in the test standard.

Time of the measurements

The measurements were done on 19th November 2008.

Measured results

The results of the thermal conductivity measurements are represented in the table 1.

Table 1. The results of the thermal conductivity measurements of the underflooring ProVent.

| Product | Thickness d (mm) | Mass per unit area (g/m^2) | Temperature difference ΔT (K) | Mean temperature T_m ($^{\circ}C$) | Heat flow density q (W/m^2) | Thermal conductivity λ ($W/m\cdot K$) |
|---------|--------------------------|--------------------------------------|--|---|--|--|
| ProVent | 3.17 | 72 | 18.69 | 10.13 | 22.27 | 0.0453 |

The estimated uncertainty of the thermal conductivity measurements was $\pm 3\%$.


The thermal resistance of the underflooring ProVent (average thickness 3.17 mm) was $0.070 (m^2 K)/W$.

The results are valid only the sample delivered to VTT.

Espoo 27st November 2008



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