University of Latvia
Faculty of physics and mathematics
Laboratory for Mathematical Modelling of Environmental and Technological Processes

Test report BI-0404/1-J

Determination of thermal transmittance and heat conductivity resistance for finished building structures according with standard LVS EN ISO 8990

Customer: "PEPI RER", Ltd.
Parka Str. 25
Valka, LV-4701
Latvia

April 2, 2004

Determination of thermal transmittance according with standard LV EN ISO 8990

Customer
"PEPI RER", Ltd., Parka Str. 25, Valka, LV-4701, Latvia.

Sampling
Way of sampling – building construction (panel) PEPI REFLEKT PLUS made by the customer.

Specimen
Short description: multi-layered building construction (total thickness 65 mm) with 5 layers:

1. gypsum-carton – 12 mm,
2. air layer – 18 mm,
3. heat insulation material (foam polyethylene with double-sided reflective low emission aluminium foil) – 5 mm,
4. air layer – 18 mm,
5. gypsum-carton – 12 mm.

Outer surface of gypsum-carton is fixed on 40x40 mm wooden frame.

Laboratory's test code: PEP-BI1-0404 **Code given by the customer**: _____

Specimen's dimensions

Parameter	*Unit*	*Value*
Width	mm	1000
Height	mm	1000
Total thickness	mm	65

Method used for the determination of heat flux density
Calibrated and guarded hot box (LVS EN ISO 8990) and heat flux sensors methods.

Specimen is fixed in the surrounding panel between hot and cold sides with inner surface oriented to the side with greater temperature. Heat chamber is fixed to the inner side of the specimen, in this way supplied heat amount flows thought testing specimen.

Heat conductivity resistance is calculated by the using of surface temperatures on both sides of the specimen and of heat flux density though it.

Thermal transmittance is calculated taking into account surface heat resistances $R_{in}=1/\alpha_{in}=0,13$ $(m^2K)/W$ and $R_{out}=1/\alpha_{out}=0,04$ $(m^2K)/W$ according with standard EN ISO 6946 (Table 1).

Units

Building structure	*Average air temperature*		*Average air temperature*		*Average surface temperature difference*	*Heat flux density*	*Heat conductivity resistance*
	Hot side	Cold side	Hot side	Cold side			
Notation	T_{GS}	T_{GA}	T_S	T_A	ΔT	q	$1/\Lambda$
Unit	°C	°C	°C	°C	°C	W/m^2	(m^{2}K)/W
5-layered structure	36,7	-2,0	35,1	-0,5	35,5	25,6	1,39
5-layered structure			35,1	-0,5	35,5	24,9	1,42

Thermal transmittance U (W/m^{2}K):

- **determined with hot box method: 0,6 (0,64)**
- **determined with heat flux sensors method: 0,6 (0,63)**

Remarks

1. Only a whole test report can be used for advertisement purposes. For reproducing of any extract from this report a written permission from the Laboratory for Mathematical Modelling of Environmental and Technological Processes is necessary.
2. In the case of using of an integral measurement method (hot box) the total thermal transmittance discloses also influence of construction's frame. Therefore such result may differ from thermal transmittance calculated by the using of differential method based on heat flux measurements in the middle of the construction.

Head of the laboratory

Dr. phys. A. Jakovičs

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Responsible executor

S. Gendelis

Rīga, April 2, 2004