

## **Thermal conductivity tests of loose-fill material "corrugated cardboard"**

**Report No 11-40/EI/274-2**

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### Customer and Contractor:

Customer:

Werrowool OÜ

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Contact person: Juhan Peedimaa, 5036117, info@tselluvill.ee

Contractor:

TalTech, Department of Energy Technology

Laboratory of Fuel and Air Emission Analysis

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Department of Energy Technology is accredited on fields of heat engineering and air emission measurements (certificate L028)

*Remark: the report can not be partly reproduced without authorization from laboratory*

## 1. General information about the samples and analysis

Sample material	Corrugated cardboard
Standard of sample producing	Not determined
Laboratory's ID number	20-163
Date of receiving samples	06.02.2020
Date of measurements	11.02.2020
Operator	M. Nuutre
Standard of analysis	EVS-EN 12667:2001
Sample conditioning temperature	22±1 °C
Instrument – heat flow meter	LaserComp FOX-304 (SN10061202)
The instrument is calibrated on 10.02.2019 with EPS standard specimen, which is calibrated on 18.04.2016, certification test no #16031216. Source of certification: TA Instruments. Expiration date of calibration: 17.04.2021. Thermal conductivity of standard specimen at 10.0 °C is 0.03223 W/(m·K)	
Orientation of instrument	Horizontal, hot side below
Mass of sample material in sample holder	0.3758 kg
Dimensions of sample holder	0.289m x 0.289m x 0.1m
Laboratory's temperature	22±1 °C

## 2. Procedure

Thermal conductivity,  $\lambda$  (W/(m·K)), measurement was carried out according to the standard EVS-EN 12667 – Thermal performance of building materials and products – Determination of thermal resistance by means of guarded hot plate and heat flow meter methods – Products of high and medium thermal resistance.

No change of weight was detected during measurement (weighted before and after the test). Sample was prepared according to customer suggestion: shaken and twirled in closed box and transferred to sample holder followed by slight press. Material density was chosen as 45 kg/m<sup>3</sup>.

### 1. Results

Expanded measurement uncertainty: ±3% (k=2; U=95%)

Material	Density*	Average temperature*	Temperature difference*	Thickness*	Heat flux*, q	Thermal conductivity, $\lambda$	Thermal resistance*, R
	kg/m <sup>3</sup>	°C	K	mm	W/m <sup>2</sup>	W/(m·K)	m <sup>2</sup> ·K/W
Corrugated cardboard	45	10.0	40.0	100.96	17.92	0.0452	2.233

Remarks:

- Results are issued as an average of five parallel measurements
- Results are valid only for samples you brought on 06.02.2020
- Parameters marked with \* are out of the accreditation scope

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