

LGAI

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Bellaterra: September 20th, 2019

File: **19/20603-1801**

Petitioner: **INDRESMAR BV**
 Urmonderbaan 22, Gate 2
 6167RF, GELEEN
 (The Netherlands)

**TEST REPORT**

Date samples received: 2019-09-09

Date testing performed: 2019-09-09 to 2019-09-12

RECEIVED MATERIAL

One sample of polyurethane foam was received from the petitioner and with the following references and measures according to the petitioner:

Product trade name: EXTRU-PUR PoP STD FORMULATION

Polyurethane foam (PUR) with a thickness of 25 mm, a density of 480 kg/m³, yellowish color and smooth appearance.

Manufacturer: INDRESMAR BV. Address: Urmonderbaan 22, Gate 2, 6167RF, GELEEN, (The Netherlands)

Sample identification	Initial dimensions of each sample tested (m)	Quantity	Sample number (laboratory)
EXTRU-PUR PoP STD FORMULATION	0.25 x 0.25 x 0.03	1	1801

Note: It is added the last column to introduce the sample identification number according to the laboratory.

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REQUESTED TESTS

Determination of the thermal conductivity according to the test standard UNE-EN 12667:2002.

TEST METHOD

Tests based on the Standard UNE-EN 12667:2002 "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."

Thermal conductivity is measured using the following equipment:

A guarded hot plate for a sample of symmetrical dimensions 500 x 500 mm, with an area of measurement of 150 x 150 mm, reducing the edge heat losses, identified as Lambda-Meter EP 500, with equipment n° 170196. The environmental atmosphere of the place that surrounded the equipment during the test is maintained between $(23 \pm 5)^{\circ}\text{C}$.

In this equipment, the sample is assembled horizontally with descending flow. The position of the hot side of the sample is the superior one.

This equipment has been verified on date 2019-09-02 using the sample pattern ETAL 125_02_GLAS of glass verified by LGAI Technological Center SA on date 2013-01-11, it is registered in the test report n°2013654.

Product standard applicable: It is not specified for the client.

SAMPLES CONDITIONING

Sample was conditioned in a conditioning chamber before the test to maintain a constant mass at $(23 \pm 2)^{\circ}\text{C}$ and $(50 \pm 5)\%$ of relative humidity by making successive weightings at intervals of 24 hours, until samples reach a constant weight, according to the test standard UNE-EN 12667:2002.

DENSITY AND MASS CHANGE

Δm_r : Relative mass change of the material as received due to drying.

Δm_c : Relative mass change of the material due to a more complex conditioning procedure.

Δm_w : Relative mass change for the material before and after the test.

ρ_c : Material density after a most complex conditioning process (until equilibrium with the normal atmosphere of the laboratory)

- **Conditioned samples**

Sample	Thickness (m)*		Δm_r^{**}	Δm_c	Density ρ_c (Kg/m ³) ***
1801	0.0253	0	0	- 0.0004	472.4

* * Thickness as measured according to the test procedure C5210451

* * Drying in heater conditioning is not performed, therefore $\Delta m_r=0$.

* * * From the dimensions of the sample, the thickness as indicated previously and conditioned mass of the sample.

- **Tested samples.**

Sample	Δ Thickness (m) ***	Δm_w	Temperature difference (K)	Average temperature during test (°C)
1801	0	0.000	15	10

* * * No variation is observed in the dimensions of the sample, so that Δ thickness=0.

The tests were carried out by the operator Rafael Carreras.

RESULTS

Uncertainty of the test = $\pm 0.003 \text{ W/m}\cdot\text{K}$

Environmental conditions: 22.4°C and RH: 55%

Date of measurements: 2019-09-12

Sample		
1801		
Temperature difference (K)	Average temperature during test (°C)	Sample thickness (m)
15	10	0.0253
Flow heat density (W/m ²)	Thermal resistance (m ² ·K/W)	Thermal conductivity (W/m·K)
39.505	0.380	0.067

Technical Director. Industrial Products
LGAI Technological Center SA (APPLUS)

Responsible for Reaction to fire and Thermal Tests
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The results refer exclusively to the samples tested at the time and under the conditions indicated.

The uncertainties expressed in this document pertain to the expanded uncertainty, which has been obtained by multiplying the typical measurement uncertainty by the coverage factor $k=2$ which, for a regular distribution, corresponds to a coverage probability of approximately 95%.

Applus+ guarantees that this task has been carried out in compliance with the requirements of our Quality and Sustainability System, and furthermore, that the contractual terms and legal regulations have been complied with. In the framework of our improvement programme, we would appreciate any comments you may deem appropriate. These should be addressed to the manager who signs this document, or to the Quality Director of Applus+, at the following address: customersatisfaction@applus.com
