



<b>REPORT No.</b>	<b>090164-a</b>
<b>CUSTOMER</b>	GARDENIA QUIMICA, S.A.
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<b>PURPOSE</b>	DETERMINATION OF THERMAL RESISTANCE BY HEAT FLOW METER METHOD ACCORDING TO UNE-EN 12667:2002
<b>TESTED SAMPLE</b>	PROJECTED CORK REF.: « <b>ISOLATE</b> »
<b>RECEPTION DATE</b>	29.09.2020
<b>TEST DATES</b>	07.10.2020 – 08.10.2020
<b>ISSUE DATE</b>	30.10.2020
<b>TRANSLATION DATE</b>	09.11.2020



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## SAMPLE CHARACTERISTICS

On 29th September 2020, TECNALIA received a rigid projected cork sample in sheets of (600 x 600 x 50) mm from GARDENIA QUIMICA, S.A., with the following reference:

«ISOLATE»

The projected cork is subject to compliance with product standard UNE-EN 13170:2013+A2:2017.

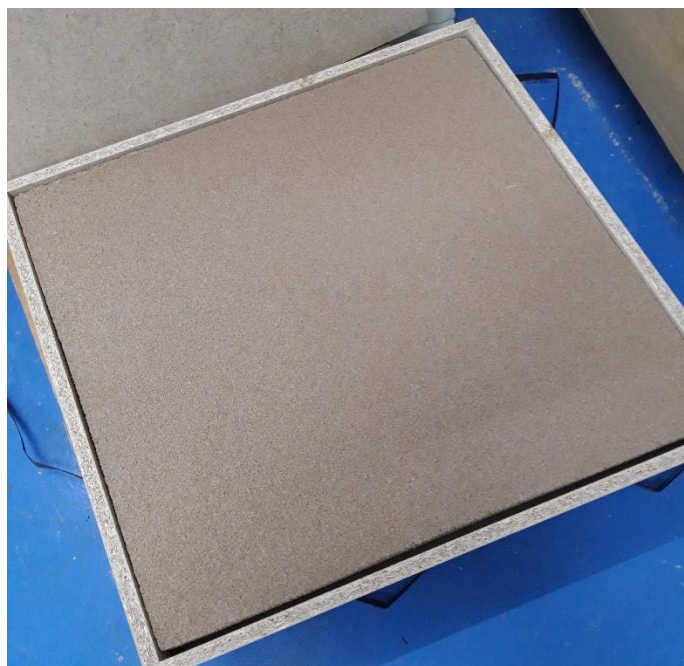


Figure 1: Photograph of the sample submitted

## TEST REQUESTED

The test requested was the determination of **thermal resistance** and the **thermal conductivity coefficient  $\lambda$  (W/m.K)** according to 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*".

## TEST PERFORMED

The thermal conductivity is measured using the heat flow meter method horizontally and, therefore, perpendicular to the sample. A measuring device (code: CO05Y39-01) using a 600 x 600 mm symmetric single sample with an effective 300 x 300 mm measurement size area is used. The sample is placed in the bottom part of the equipment, more specifically over the hot plate (bottom plate).

The metal sides were removed from the sandwich panel by TECNALIA technical staff until only the core was left. The core was then machined until a completely smooth sheet was obtained. All physical characteristics described in this report concern only the panel core.

The sample is assembled horizontally with upward flow and is fitted with two heat flow meters. The hot side of the sample is in the bottom position.

Last calibration date was 07/10/2020, and associated standards used were calibrated by IRMM, with a thermal resistance of 1.12 m<sup>2</sup>K/W at 10 °C. The standard calibration expires after one month.

## CONDITIONING

Although no instructions were provided by the customer in this regard, the sample was conditioned for seven days at (23 ± 2) °C and 50 ± 5% relative humidity. After conditioning, dimensional parameters are measured and testing takes place.

The dimensional characteristics measured before and after conditioning are:

Sample	Thickness measured (m)	Mass before (kg)	Mass afterwards (kg)	Mass difference (%)
1	0.049	3.91	3.91	0.1

*Table 1: Characteristics of the sample*

No steam-tight wrap was used between conditioning and testing; or during the test.

## RESULTS

The stable part of the test lasted 5 hours and the test was performed by Ainhoa Galpasoro.

The thermal resistance characteristics measured in test specimen were the following:

Sample	Thickness (m)	Width (m)	Length (m)	Weight (kg)	Density (kg/m <sup>3</sup> )
1	0.046	0.606	0.601	3.91	217

Table 2: Characteristics of the sample

Initial testing conditions were as follows:

- Setpoint temperature on the hot side: 15 °C
- Setpoint temperature on the cold side: 5 °C
- Temperature difference between the hot and cold side was 10 °C.
- Average test temperature was 283 °K

No changes were observed in the test specimen thickness or volume during the test. Relative mass change was 0%.

The following table shows the results of the test on the 49 mm thick product under the reference «ISOLATE»:

Sample	Thermal conductivity (W/mK)	Heat flow density (W/m <sup>2</sup> )	Thermal resistance (m <sup>2</sup> K/W)	Measurement uncertainty (%)
ISOLATE	0.045	9.55	1.03	3.1

Table 3: Test results

### UNCERTAINTY STATEMENT

The expanded measurement uncertainty was obtained by multiplying the standard measurement uncertainty by a coverage factor  $k=2$ , which, for a normal distribution, corresponds to a coverage probability of around 95%.