

5190243IB02

2019111501

Test Result : PASS

Report No : 2019111501

Applicant : **5K MÜHENDİSLİK TAAHHÜT ELEKTRİK İNŞAAT SAN. VE TİC. LTD. ŞTİ.**

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Sample : REDPAINT

	TEST	METHOD	RESULT
*	Thermal insulation; determination of steady-state thermal resistance and related properties; guarded hot plate apparatus	ISO 8302	0.088 W/(m.K)
*	Heat Resistance	Inhouse Method	PASS



Seal



A handwritten signature in black ink.

Customer Representative
Hasan KUTLU



Laboratory Manager
Hava Sarıaydın

EUROLAB LABORATUVAR HİZMETLERİ
TÜRCERT TEKNİK KONTROL VE BELGELENDİRME A.Ş.**EUROLAB® (TÜRCERT TEKNİK KONTROL VE BELGELENDİRME A.Ş.)**

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Environment

The requirements and standards apply to equipment intended for use in

X	Residential (domestic) environment
X	Commercial and light-industrial environment
X	Industrial environment
X	Medical environment



Thermal Insulation - Determination of Steady Thermal Resistance and Related Properties

Method

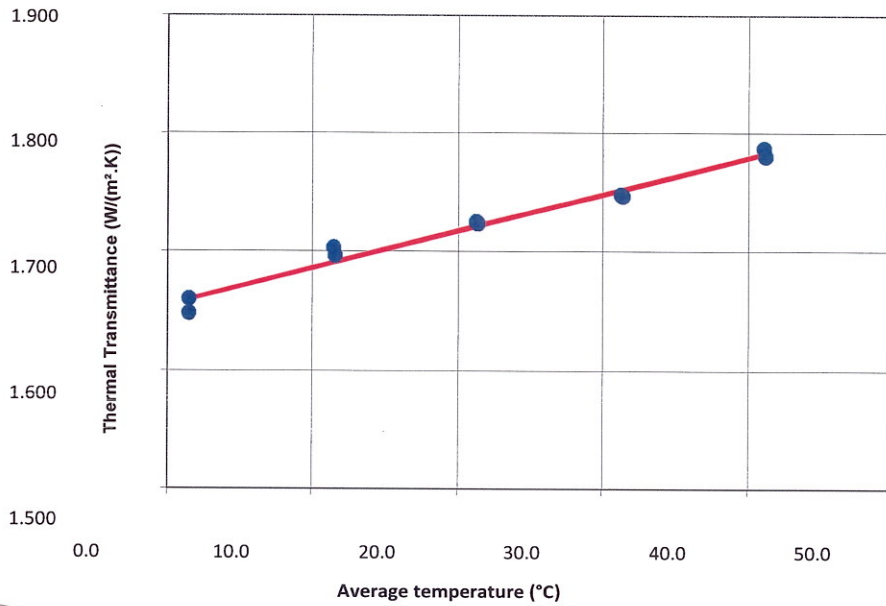
The thermal resistance of the samples was measured with a heat flow meter for 30x30 cm samples as described in ISO 8302 (Figure 1). The device consists of a central hot plate with a cold plate above and below. Round heat flow meters with a diameter of 10 cm are positioned centrally in the lower part of the upper plate, on both sides of the central plate and in the upper part of the lower plate. These heat flow counters are embedded in a neoprene sheet that is the same thickness as the counters and is as large as the area of the plates. In the middle of each plate side, extremely thin Cu / Co thermocouples are glued against the heat flow counters. Samples are then mounted between the top plate and the center plate and between the bottom plate and the center plate. All of them are finally packaged in a thermally insulated box to create close to adiabatic conditions around the installation. Before the measurements start, heat flow meters are recalibrated using reference samples of the EU's BCR.

The temperature difference between the thermostatic bath that keeps the upper and lower cold plate at temperature and the thermostatic bath that keeps the central hot plate at temperature is set to 10 ° C. The temperatures and heat fluxes on both surfaces of the samples are not fixed, all data are recorded in the 10 "time interval and stored on the hard disk. All calculations are done in Excel. Values are converted in averages lasting three hours and the resistance is calculated using the equation below.

$$R = \frac{\Delta\theta}{C_1 E_1 + C_2 E_2}$$

C_1, C_2
 E_1, E_2
[mV]

Calibration constants of heat flow meters W / (m².mV)
Electric voltage difference measured on heat flow meters at mV
Temperature difference on samples in K (measured with Cu / Co thermocouples)



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Results of the measurement

Sample	Thickness m	Vol. humidity %m ³ /m ³	Average Temperature °C	Temperature Difference °C	Thermal Resistance m ² .K/W ₁)
1	0.02	0	1.5	9.0	0.60 ²
			11.5	9.2	0.58 ⁷
			21.4	9.2	0.58 ⁰
			31.3	9.3	0.57 ²
			41.2	9.2	0.56 ⁰
2	0.02	0	1.6	8.9	0.60 ⁷
			11.6	9.1	0.59 ⁰
			21.5	9.2	0.58 ⁰
			31.4	9.2	0.57 ²
			41.3	9.2	0.56 ²
3	0.02	0	1.6	9.2	0.60 ⁵
			11.6	8.7	0.59 ²
			21.4	9.3	0.58 ¹
			31.4	9.4	0.58 ²
			41.3	9.2	0.57 ²

(1) The last number in the superscript is uncertain

Sample	$\frac{\partial q}{q}$ %	$\frac{\partial \theta}{\theta}$ %	$\frac{qR_n}{\Delta \theta}$ %	Maximum Uncertainty %	Most Possible Uncertainty %
1	1.5	0.55	1	3.1	1.9
2	1.5	0.55	1	3.1	1.9
3	1.5	0.55	1	3.1	1.9



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Thermal conductivity at different average temperatures

These are given in the table below:

Average Temperature °C	Thermal Conductivity W/(m.K)
-10	0.059
0	0.060
10	0.061
20	0.062
30	0.063
50	0.066
100	0.071
200	0.083
300	0.094
400	0.106
500	0.117

REDPAINT decreases to 36 W / m, i.e. it decreases by 77.3%.

The average thermal conductivity in REDPAINT then reaches 0.088 W / (m.K).

In the test environment, the relative humidity in the environment is 50%.

In the test environment, the air temperature is about 21 degrees Celsius.



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The test started on October 11, 2019 at 15.30. The ambient temperature at which the test is carried out is 24 ° C relative humidity 60%. 200 ° C dry hot air was introduced into the sample and changes were observed. Observations during the test are described below.

Time (dk:sn)	Observations
0:00	The device was switched on and dry hot air was introduced into the sample.
0:05	No changes were observed.
0:10	No changes were observed.
0:15	No changes were observed.
0:20	No changes were observed.
0:30	No changes were observed.
0:45	No changes were observed.
1:00	No changes were observed.
1:30	No changes were observed.
2:10	No changes were observed.
3:30	No changes were observed.
5:00	Slight color change was observed.
5:15	Slight color change was observed.
5:20	Slight color change was observed.
5:40	Slight color change was observed.
6:30	Slight color change was observed.
8:10	Slight color change was observed.
9:30	Slight color change was observed.
11:00	Slight color change was observed.
13:00	Color change progressed.
14:00	Color change progressed.
15:00	Color change progressed.

Overall Assessment: The color change observed after 15 minutes is below the expected level. REDPAINT sample is resistant to 200 ° C.

***** End of Report*****

