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Report to: PeriBack, LLC

Report Date: 02/04/2025
Test ID: MT-001110
Test Name: ASTM C518

Aim of the test

To determine steady-state thermal transmission properties (thermal resistance) of the open cell polyurethane sample.

Test method

The thermal resistance test was performed according to ASTM C518: Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.

Sample description

Material Details	
Product description	Open cell polyurethane sample
Sample IDs	Open Cell Polyurethane

Sample conditioning

The test specimen was conditioned for a minimum of 24 hours at 73 ± 4 °F (23 ± 2 °C) and 50 ± 5 % RH prior to test.

Test procedure

This test method covers the measurement of steady state thermal transmission through flat slab specimens using a heat flow meter apparatus.

The heat flow meter apparatus establishes steady state one-dimensional heat flux through a test specimen between two parallel plates at constant but different temperatures. By appropriate calibration of the heat flux transducers with calibration standards and by measurement of the plate temperatures and plate separation. Fourier's law of heat conduction is used to calculate thermal

conductivity, and thermal resistivity or thermal resistance and thermal conductance. Prior to testing, the apparatus was calibrated against a standard traceable to NIST.

The mean temperature of the test specimen was 75 ± 2 °F (23.9 ± 2 °C) with a temperature difference across the specimen of 40 ± 2 °F (22 ± 2 °C).

Test results

Table 1: Thermal resistance results

Specimen	SI Unit	Values
Heat Flow Meter Size	mm by mm	305 by 305
Tested Specimen Thickness	mm	28.26
Specimen Density	kg/m^3	27.44
Cold Plate Temperature	°C	12.78
Hot Plate Temperature	°C	35.01
Average Specimen Temperature	°C	23.90
Apparent Thermal Conductivity	W/m·K	0.0388
Thermal Resistivity	m·K/W	25.8
Thermal Resistance (RSI)	m^2·K/W	0.73
Length of Test	h	1.6

Abridged ASTM C518 Test Report.

The precision of this test is estimated to be 2.12 % (ASTM C518-21, Section 10.8).

Table 2: Post test observations

Calibration Factor Used for Manual Calculation	NA
Heat Flow Direction	Up
Edge Guards or Cabinet Temperature Satisfactory	Yes
Excessive Moisture on Cold Plate	No
Calibration Factor Used for Manual Calculation	NA

Summary of test results

The average thermal resistance, R-value of the sample material tested is 4.14 ft^2·h·°F/Btu (RSI value 0.73 m^2·K/W) at 75 ˚F (24 °C) mean temperature.

Experimental images

Figure 1: Test specimen as tested

Figure 2. Test specimen in the heat flow meter apparatus

Report Reviewed by:

Ruchika Yogesh

Dr Ruchika Yogesh
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End of the Report