



TR0453/EZ03/02

Thermal Resistance of four Neopor EPS Insulation Samples

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All tests reported herein have been undertaken at the BRANZ Ltd laboratories located in Judgeford, Porirua, New Zealand, unless stated otherwise.

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All tests reported herein have been performed in accordance with the laboratory's scope of accreditation.

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1. CLIENT

Koolfoam Industries Ltd
PO Box 23 123
Papatoetoe
Auckland

2. DESCRIPTION OF TEST EQUIPMENT

The test equipment used was a LaserComp Fox 600 heat flow meter. The specimen for testing is placed horizontally in the apparatus, with upwards heat flow. The hot and cold plates each have a 250 mm x 250 mm heat flux transducer embedded in their surface. The edges of the specimen are insulated from the room ambient temperature.

3. PROCEDURE

The specimen was supplied by the client and consisted of four pieces of 40 mm thick and four pieces of 60 mm thick EPS foam insulation. Three 40 mm test samples were randomly selected. They were tested at their actual thicknesses, to the requirements of ASTM C518-04. One of the 60 mm pieces was tested at its actual thickness to the requirements of ASTM C518-04 to confirm linearity of the thermal conductivity.

4. RESULTS

Test conditions


Nominal Upper Plate Temperature	13 °C
Nominal Lower Plate Temperature	33 °C
Nominal Difference in Temperature	20 K
Nominal Mean Temperature	23 °C

Measured results

Calibration check	PUF 01, 03-Jun-08				
BRANZ reference		D4170A	D4170B	D4170C	D4171
Sample weight	gram	372	370	379	537
'grams per sq. metre'		1033	1028	1053	1492
Test date		04-Jun-08	04-Jun-08	04-Jun-08	05-Jun-08
Test thickness	mm	40.5	40.6	40.5	59.8
Density	kg/m ³	25.5	25.3	26.0	24.9
Temperature difference	K	20.0	20.0	20.0	20.0
Mean temperature	°C	23.0	23.0	23.0	23.0
Heat-flux	W/m ²	15.24	15.26	15.35	10.39
Thermal resistance	m ² K/W	1.313	1.311	1.303	1.924
Thermal conductivity	W/mK	0.0309	0.0310	0.0310	0.0311
Difference between heat flux transducers	%	0.2	0.1	0.1	0.2

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These measurements comply with the requirements of ASTM C518. The uncertainty in the measurements of thermal conductivity and thermal resistance are estimated to be $\pm 3\%$.


5. REFERENCES

ASTM C518-04 *Standard Test Method for Steady-State Heat Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.*
American Society for Testing and Materials, Philadelphia, PA, 2004.

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