

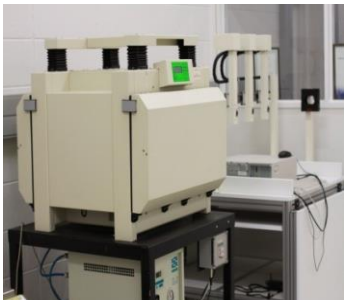

TEST REPORT

DC12873-001

THERMAL TESTING OF TWO INSULATION SAMPLES

CLIENT
Rockcote Resene Limited
PO BOX 39-108
Harewood
Christchurch 8545
New Zealand

All tests and procedures reported herein, unless indicated, have been performed in accordance with the laboratory's scope of accreditation

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NATA

IANZ

TO WHOM IT MAY CONCERN

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(i) recognises within its scope of recognition of this Arrangement the accreditation of an organisation by other signatories as being equivalent to an accreditation by its own organisation,

(ii) accepts, for its own purposes, endorsed* certificates or reports issued by organisations accredited by other signatories on the same basis as it accepts endorsed* certificates or reports issued by its own accredited organisations,

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* *The word "endorsed" means a certificate or report bearing an Arrangement signatory's accreditation symbol (or mark) preferably combined with the ILAC-MRA Mark.*

Signed:

Jennifer Evans
NATA CEO

Date: 24 March 2014

Dr Llewellyn Richards
IANZ CEO

Date: 24th March 2014

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1. TEST SPONSOR

Rockcote Resene Limited
PO BOX 39-108, Harewood, Christchurch 8545, New Zealand

2. LIMITATION

The results reported here relate only to the item/s tested.

3. TERMS AND CONDITIONS

This report is issued in accordance with the Terms and Conditions as detailed and agreed in the BRANZ Services Agreement for this work.

4. 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.

Table 1: Test condition set-points

Nominal Upper Plate Temperature	10.0	°C
Nominal Lower Plate Temperature	36.0	°C
Nominal Difference in Temperature	26.0	K
Nominal Mean Temperature	23.0	°C

5. PROCEDURE

The sample segments were conditioned for at least 12 hours at 23 ± 3 °C and 50 ± 5% relative humidity, prior to the thermal performance measurements. After conditioning, they were tested at the actual measured thickness, to the requirements of ASTM C518.

The best expanded uncertainty of measurement (3%) is only achieved with heterogeneous material with R-value greater than 0.1 m^2K/W when the percentage difference between the heatflux transducers readings is less than 5%. If the difference is greater than 5% then the uncertainty in the measurements of thermal resistance and conductivity will be greater than 3%.

6. DESCRIPTION OF TEST SAMPLES

The specimens were supplied by the client and consisted of one piece of blue XPS insulation segment and one piece of autoclaved aerated concrete (AAC). The dimensions of the samples were approximately 600 x 600 mm.

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7. RESULTS

Table 3: Measured test temperature

Temperature Difference	26.0	± 0.1	K
Mean Test Temperature	23.0	± 0.1	°C

Table 4: Measured results for the test specimens

Calibration check		15-Jun-20, SR07	
BRANZ reference		20/164	20/224
Client reference		AAC	XPS
Sample weight	gram	9892	608
'grams per sq. metre'	g/m^2	27477.8	1672.1
Test date		23-Jun	17-Jun
Test thickness	mm	49.5	49.9
Density	kg/m^3	555.1	33.5
Heat-flux	W/m^2	78.60	15.78
Thermal resistance	m^2K/W	0.331	1.65
Apparent thermal conductivity	W/mK	0.1496	0.0303
Difference between heat flux transducers	%	0.2	0.8

* Thermal conductance can be calculated by dividing the thermal conductivity by the thickness of the specimen

* Average temperature gradient in the specimen during test can be calculated by dividing the temperature difference by the thickness of the specimen

* The minimum duration of the measurement portion of the test once steady state equilibrium is achieved is 18 minutes

Some foam insulation materials such as phenolic, polyurethane, polyisocyanate and extruded polystyrene can exhibit the characteristic of aging of the material, the thermal conductivity increasing with time. Since the previous history of the test material is unknown and no accelerated aging has been performed, these results should without further information be considered as representative of the performance of new material only and actual longer term in-service thermal conductivity may be higher.

8. REFERENCES

ASTM C518 *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, 2017.

This is the end of the report

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