BRANZ

# EC1325/01

# Thermal Resistance of Nine Samples of Three Glasswool Pipe Insulation Products


**Author:** Sheng-Huei Huang
Technician

**Reviewer:** Roger Stanford
Senior Technician
IANZ Approved Signatory


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


**Contact:** BRANZ PTY Ltd
Unit 3/20 West Street
Brookvale
NSW 2100
Australia
Tel: +61 2 9938 6011
Fax: +61 2 9938 6911
www.branz.com.au


International Accreditation New Zealand (IANZ) has a Mutual Recognition Agreement (MRA) with the National Association of Testing Authorities (NATA), such that both organisations recognise accreditations by IANZ and NATA as being equivalent. Users of test reports are recommended to accept test reports in the name of either accrediting body.

# Thermal Resistance of Nine Samples of Three Glasswool Pipe Insulation Products

## 1. CLIENT

FM Insulation Supplies
Unit 6/10 Bromley
Emu Plains
NSW 2750
Australia

## 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 flows. 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. The uncertainty in individual thermal conductivity and thermal resistance measurements is estimated to be 3%.

## 3. PROCEDURE

The specimens, supplied by the client, were nine samples in total. There are three yellow glasswool pipe insulation products (client reference 1a, 1b and 1c), three samples of each type. Each of the nine samples comprised two 180 degree halves. They were cut, flattened, and then made up to the test size of 600 x 600 mm and tested at the actual thicknesses for the products, to the requirements of ASTM C518-04.

## 4. RESULTS

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

SHH
SHH

RSS

**Product 1 a (25mm)**

| Calibration Check Date | | 23 Jan 07 | 07 May 07 | 07 May 07 |
|---|---|---|---|---|
| Calibration Check Sample | | EPS 13 | EPS 08 | EPS 08 |
| BRANZ reference | | D3861 | D3916 | D3915 |
| Client reference | | Product 1a/1 | Product 1a/2 | Product 1a/3 |
| 'grams per sq. metre' | $g/m^2$ | 1342 | 1650 | 1869 |
| Test Date | | 26 Jan | 09 May | 08 May |
| Test thickness | mm | 25.1 | 25.9 | 26.8 |
| Nominal thickness | mm | 25 | 25.0 | 25.0 |
| Temperature difference | K | 20.0 | 20.0 | 20.0 |
| Mean Temperature | °C | 23.0 | 23.0 | 23.0 |
| Heat-flux | $W/m^2$ | 27.21 | 26.62 | 25.08 |
| Thermal resistance | $m^2K/W$ | 0.735 | 0.752 | 0.798 |
| Thermal conductivity | W/mK | 0.0341 | 0.0344 | 0.0336 |
| Difference between heat flux transducers | % | 0.3 | 0.1 | 0.3 |

**Product 1 b (40mm)**

| Calibration Check Date | | 23 Jan 07 | 07 May 07 | 07 May 07 |
|---|---|---|---|---|
| Calibration Check Sample | | EPS 13 | EPS 08 | EPS 08 |
| BRANZ reference | | D3862 | D3918 | D3917 |
| Client reference | | Product 1b/1 | Product 1b/2 | Product 1b/3 |
| 'grams per sq. metre' | $g/m^2$ | 2386 | 2286 | 2722 |
| Test Date | | 26 Jan | 09 May | 09 May |
| Test thickness | mm | 38.7 | 41.0 | 39.3 |
| Nominal thickness | mm | 40 | 40.0 | 40.0 |
| Temperature difference | K | 20.0 | 20.0 | 20.0 |
| Mean Temperature | °C | 23.0 | 23.0 | 23.0 |
| Heat-flux | $W/m^2$ | 18.18 | 18.05 | 17.43 |
| Thermal resistance | $m^2K/W$ | 1.100 | 1.108 | 1.147 |
| Thermal conductivity | W/mK | 0.0352 | 0.0370 | 0.0343 |
| Difference between heat flux transducers | % | 0.5 | 0.9 | 0.7 |

SHH
SHH

RSS

**Product 1c (50mm)**

| Calibration Check Date | | 23 Jan 07 | 07 May 07 | 07 May 07 |
|---|---|---|---|---|
| Calibration Check Sample | | EPS 13 | EPS 08 | EPS 08 |
| BRANZ reference | | D3863 | D3920 | D3919 |
| Client reference | | Product 1c/1 | Product 1c/2 | Product 1c/3 |
| 'grams per sq. metre' | $g/m^2$ | 2942 | 2739 | 2897 |
| Test Date | | 29 Jan | 11 May | 10 May |
| Test thickness | mm | 46.0 | 50.3 | 47.3 |
| Nominal thickness | mm | 50 | 50.0 | 50.0 |
| Temperature difference | K | 20.0 | 20.0 | 20.0 |
| Mean Temperature | °C | 23.0 | 23.0 | 23.0 |
| Heat-flux | $W/m^2$ | 14.92 | 14.01 | 14.08 |
| Thermal resistance | $m^2K/W$ | 1.341 | 1.428 | 1.421 |
| Thermal conductivity | W/mK | 0.0343 | 0.0352 | 0.0333 |
| Difference between heat flux transducers | % | 0.5 | 0.5 | 0.8 |

These measurements comply with the requirements of ASTM C518. The uncertainty in the measurements of thermal conductivity and thermal resistance are estimated to be ± 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.

SHH
SHH

RSS