
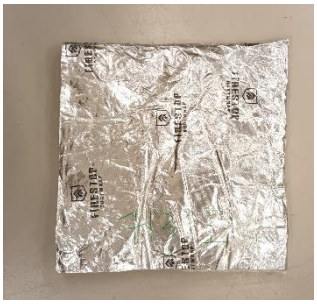
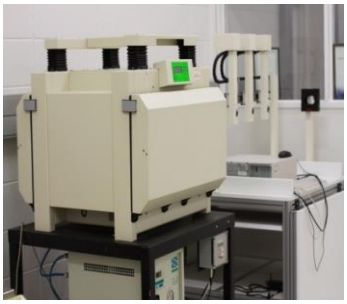

TEST REPORT

DI18290-04

THERMAL TESTING OF FIRESTOP DUCT WRAP-38

CLIENT
Firestop Centre Ltd
657 Great South Rd
Penrose
Auckland

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

Both NATA (National Association of Testing Authorities, Australia) and IANZ (International Accreditation New Zealand) are signatories to the ILAC Mutual Recognition Arrangement. Under the terms of this arrangement, each signatory:

(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,

(iii) recommends and promotes the acceptance by users in its economy of endorsed* certificates and reports,

* *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

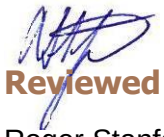
Dr Llewellyn Richards
IANZ CEO

Date: 24th March 2014

SIGNATORIES

Author

Sheng-Huei Huang
Senior Technician
Authorised to author this report



Reviewed by

Roger Stanford
Senior Technician
Authorised to review this report

Authorised by

Sheng-Huei Huang
Senior Technician
Authorised to release this report to client

DOCUMENT REVISION STATUS

ISSUE NO.	DATE ISSUED	DESCRIPTION
01	11/12/2023	Initial Issue

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1. TEST SPONSOR

Firestop Centre Ltd

657 Great South Rd, Penrose, Auckland

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. TEST SAMPLES

The specimens were supplied by the client and consisted of 12 pieces of ductwrap insulation segment. Ten samples were selected for the test. The nominal thickness of the product is 0.038 m (d_N). The dimensions of the samples were approximately 600 x 600 mm.

Table 1: Sample identification and traceability information

BRANZ Sample No.	Client Reference	Traceability Information
D7131A	-	-
D7131B		
D7131C		
D7131D		
D7131E		
D7131F		
D7131G		
D7131H		
D7131I		
D7131J		

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5. TEST EQUIPMENT

All tests reported have been undertaken at BRANZ Ltd laboratories located at Judgeford, unless stated otherwise. The ASTM C518 compliant test equipment used was a LaserComp FOX600 heat flow meter and Wintherm software. 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 2: 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

6. PROCEDURE

The test was performed in accordance with AS/NZS 4859.1. The thickness was measured to the requirements of ASTM C167 and AS/NZS 4859.1 Appendix B. The specimens were tested at the lesser of nominal thickness and actual measured thickness, to the requirements of ASTM C518.

Because the test specimen is not a homogeneous material the thermal conductivity is described as apparent and is assumed to be dependent on thickness.

Results were adjusted from test temperature of 23°C to declared temperature of 15°C for New Zealand products (according to AS/NZS 4859.2 Clause 5.2).

6.1 Measurement uncertainty

The estimated overall uncertainty of measurement is 2.0%.

7. CONDITIONING

The sample segments were conditioned for at least 24 hours at 23 ± 3 °C, prior to the thermal performance measurements. The thickness and the weight of the specimens were recorded both before and after conditioning. Only the relevant results are included in this test report.

8. RESULTS

Table 3: Measured test temperature

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

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Table 4: Measured results for the test specimens

Calibration check	04/12/23 SR11					
BRANZ reference		D7131A	D7131B	D7131C	D7131D	D7131E
Sample weight	gram	1667	1724	1526	1418	1356
'grams per sq. metre'	g/m^2	4346.7	4466.2	4159.5	3843.6	3659.8
Test date		5/12/23	5/12/23	5/12/23	5/12/23	5/12/23
Measured thickness	mm	59.0	62.9	59.5	51.0	49.1
Test thickness	mm	38.0	38.0	38.0	38.0	38.0
Density	kg/m^3	114.4	117.5	109.5	101.1	96.3
Heat-flux	W/m^2	24.09	24.38	24.43	24.18	24.38
Thermal resistance	m^2K/W	1.08	1.07	1.07	1.08	1.07
Thermal conductivity	W/mK	0.0352	0.0356	0.0357	0.0353	0.0356
Difference between heat flux transducers	%	0.5	0.0	0.1	0.1	0.5
Results adjusted from test temperature of 23°C to declared temperature of 15°C for New Zealand products *(according to AS/NZS 4859.2 Clause 5.2, see note in Section 6 of this report)*						
Thermal resistance	m^2K/W	1.12	1.11	1.11	1.12	1.11
Thermal conductivity	W/mK	0.0339	0.0343	0.0343	0.0340	0.0343

* 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 (0.2% / 12 mins) is achieved is 6 minutes

Table 4: Continued from previous page

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Calibration check	04/12/23 SR11					
BRANZ reference		D7131F	D7131G	D7131H	D7131I	D7131J
Sample weight	gram	1408	1328	1507	1386	1720
'grams per sq. metre'	g/m^2	3669.0	3371.7	3932.0	3734.1	4549.7
Test date		6/12/23	6/12/23	6/12/23	6/12/23	6/12/23
Measured thickness	mm	49.7	48.5	51.9	48.3	60.3
Test thickness	mm	38.0	38.0	38.0	38.0	38.0
Density	kg/m^3	96.6	88.7	103.5	98.3	119.7
Heat-flux	W/m^2	24.35	24.13	24.42	23.97	24.49
Thermal resistance	m^2K/W	1.07	1.08	1.07	1.09	1.06
Thermal conductivity	W/mK	0.0356	0.0353	0.0357	0.0350	0.0358
Adjusted thermal conductivity	W/mK	0.0356	0.0353	0.0357	0.0350	0.0358
Difference between heat flux transducers	%	0.1	0.7	0.6	0.4	0.3
Results adjusted from test temperature of 23°C to declared temperature of 15°C for New Zealand products *(according to AS/NZS 4859.2 Clause 5.2, see note in Section 6 of the report)*						
Thermal resistance	m^2K/W	1.11	1.12	1.11	1.13	1.10
Thermal conductivity	W/mK	0.0343	0.0340	0.0343	0.0337	0.0344

* 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 (0.2% / 12 mins) is achieved is 6 minutes

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9. REFERENCES

AS/NZS 4859.1 *Thermal insulation materials for buildings – Part 1: General criteria and technical provisions*
Standards Australia, Sydney, Standards New Zealand, Wellington, 2018.

AS/NZS 4859.2 *Thermal insulation materials for buildings – Part 2: Design.*
Standards Australia, Sydney, Standards New Zealand, Wellington, 2018.

ASTM C167 *Standard Test Methods for Thickness and Density of Blanket or Batt Thermal Insulations*.
American Society for Testing and Materials, Philadelphia, PA, 2018.

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.

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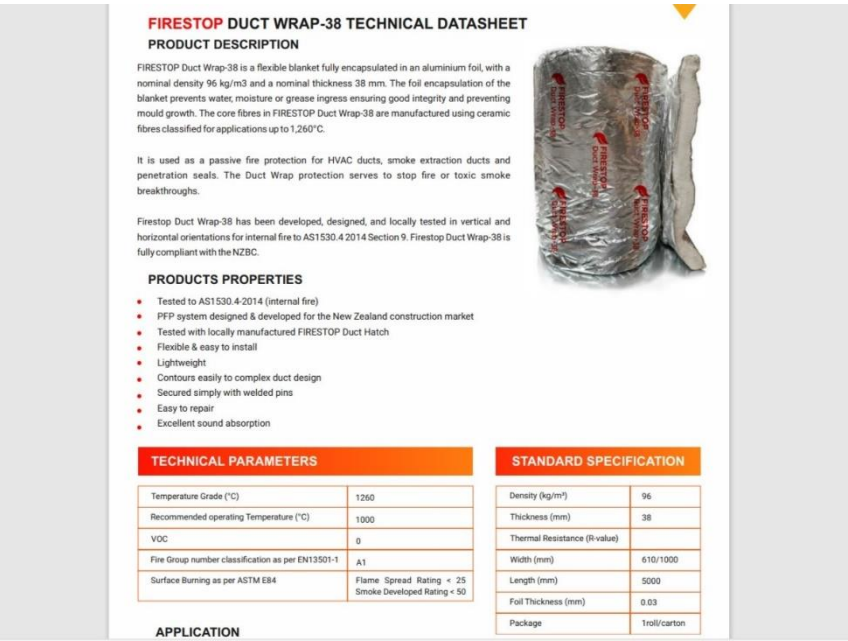
APPENDIX

(A) PRODUCT LABEL DETAILS

Table 5: Label information (AS/NZS 4859.1 Table 3.1)



FIRESTOP DUCT WRAP-38 TECHNICAL DATASHEET

PRODUCT DESCRIPTION

FIRESTOP Duct Wrap-38 is a flexible blanket fully encapsulated in an aluminium foil, with a nominal density 96 kg/m3 and a nominal thickness 38 mm. The foil encapsulation of the blanket prevents water, moisture or grease ingress ensuring good integrity and preventing mould growth. The core fibres in FIRESTOP Duct Wrap-38 are manufactured using ceramic fibres classified for applications up to 1,260°C.

It is used as a passive fire protection for HVAC ducts, smoke extraction ducts and penetration seals. The Duct Wrap protection serves to stop fire or toxic smoke breakthroughs.

Firestop Duct Wrap-38 has been developed, designed, and locally tested in vertical and horizontal orientations for internal fire to AS1530.4 2014 Section 9. Firestop Duct Wrap-38 is fully compliant with the NZBC.

PRODUCTS PROPERTIES

- Tested to AS1530.4-2014 (internal fire)
- PFP system designed & developed for the New Zealand construction market
- Tested with locally manufactured FIRESTOP Duct Hatch
- Flexible & easy to install
- Lightweight
- Contours easily to complex duct design
- Secured simply with welded pins
- Easy to repair
- Excellent sound absorption

TECHNICAL PARAMETERS

Temperature Grade (°C)	1260
Recommended operating Temperature (°C)	1000
VOC	0
Fire Group number classification as per EN13501-1	A1
Surface Burning as per ASTM E84	Flame Spread Rating < 25 Smoke Developed Rating < 50

STANDARD SPECIFICATION

Density (kg/m³)	96
Thickness (mm)	38
Thermal Resistance (R-value)	
Width (mm)	610/1000
Length (mm)	5000
Foil Thickness (mm)	0.03
Package	1roll/carton

APPLICATION

Product name	Firestop Duct Wrap-38
Description of contents	Flexible blanket fully encapsulated in an aluminium foil
Name of manufacturer/supplier	Firestop Centre Ltd
Address of manufacturer/supplier	657 Great South Rd Auckland New Zealand
Identification of manufacturing plant	-
Batch identification or other traceability information	See Table 1
Safety guidance	-
A statement of conformance with AS/NZS 4859.1	-
Declared material R-value and the temperature at which it applies	-
Number of pieces	1 roll/carton
Nominal total area	-
Nominal length, width, and thickness	5000 mm, 610/1000 mm, 38 mm (foil thickness 0.03 mm)
Nominal net weight of contents or supplied quantity	96 kg/m^3

(B) STATISTICAL CALCULATION OF $R_{50/90}$

The statistical analysis of $R_{50/90}$ is calculated in accordance with AS/NZS 4859.1 Clause 2.3.3.5.

The declared R-value and declared thermal conductivity shall be derived from the statistically adjusted mean values $\lambda_{50/90}$ and $R_{50/90}$, representing a 50% fractile with 90% confidence, and a one-sided statistical tolerance interval, and which shall be based on thermal measurements on at least 10 individual specimens. $\lambda_{50/90}$ and $R_{50/90}$ shall be calculated using the following equations:

$$R_{50/90} = R_{mean} - k_2 \cdot s$$

$$\lambda_{50/90} = \lambda_{mean} + k_2 \cdot s$$

where

k_2 = coefficient used when the standard deviation is estimated for one-sided tolerance interval

s = sample standard deviation for the 10 or more measured values used to determine the declared value

Note 1: for the particular case of n = 10, the value of k_2 in Table C.1, Annex C, ISO 10456:2007 is 0.44.

Note 2: if any sample < nominal thickness then λ_{mean} = mean of the adjusted λ values

Table 6: Summary results from statistical calculation at declared temperature of 23°C for products sold in Australia and 15°C for New Zealand

Declared temp.	23	15	°C
R_{mean}	1.07	1.11	m^2K/W
λ_{mean}	0.0355	0.0342	W/mK
Std. dev. of 10 test samples	0.7	0.7	%
$R_{50/90}$	1.07	1.11	m^2K/W
$\lambda_{50/90}$	0.0356	0.0343	W/mK

This is the end of the report

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