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**AIR AND WATER PERMEABILITY TESTING
OF SIDERISE CW-FS PERIMETER BARRIER
AND FIRE STOP SYSTEM**

REPORT No. BP7101/1/RPF/16

Prepared for:

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For the attention of:

Mr Chris Mort

Date:

21st March 2016

AIR AND WATER PERMEABILITY TESTING OF SIDERISE CW-FS PERIMETER BARRIER AND FIRE STOP SYSTEM**SUMMARY**

The Siderise CW-FS Perimeter Barrier and Fire Stop System taped joints have been tested for Air and Water Permeability to the requirements of ETAG 026.

The maximum air leakage through the taped joints is 0.11 m³/hr.m length of taped joint and 0.44 m³/hr.m² of area. This compared to 16.97 m³/hr.m and 67.89 m³/hr.m², without the joint taped.

The taped joint has achieved Class R7 in accordance with BS EN 12154:2000 when subjected to the 'External Use' water permeability test and in the 'Internal Use; water permeability test, was water tight to 25mm of water pressure, which is equivalent to water tight to 250 Pa.

1 INTRODUCTION

Building Investigation and Testing Services (Surrey) Ltd (❖B.I.T.S.❖) have been requested by Mr Chris Mort of Siderise Insulation Ltd to carry out Air and Water Permeability tests on their CW-FS Perimeter Barrier and Fire Stop System taped joints.

The testing and evaluation to be in accordance with the European Organisation for Technical Approvals (EOTA) ETAG 026 "Guidance for European Technical Approvals for Fire Stopping and Fire Sealing Products".

This work was authorised by the Siderise Insulation Ltd Purchase Order No. 417714 dated 17th August 2015.

The testing was carried out between the 16th September 2015 and 18th March 2016.

2 MATERIAL RECEIVED

The following material was received from Siderise Insulation Ltd on the 9th September 2015 in a cardboard box on a pallet.

- Five nominally 1200mm by 1200mm by 120mm thick reinforced foil faced mineral wool boards.
- One roll of 120mm wide self-adhesive aluminium foil tape labelled 'Tickitape'.

The foil faced mineral wool boards all have strip labels marked:

"← cut this way →", "Lamatherm" and "manufactured by Siderise Insulation Ltd Tel: 01656 730833 www.siderise.com".

Each board also has a white label marked:

“Siderise 8% Recycled, Sampled by: (signature possibly Sprelles 1121), Date Sampled: 28th January 2015, Certifire”.

3 TEST METHOD

3.1 Air Permeability

The air permeability has been determined by testing to the requirements of ETAG 026 Part 1 : “General”, Clause 2.4.3 and ETAG 026 Part 5 : “Cavity Barriers”, Clause 2.4.3, which requires that the cavity barrier is tested to BS EN 1026 : 2000 “Windows and doors – Air permeability – Test method”. With the leakage rate expressed as $\text{m}^3/\text{hr.m}^2$.

The air permeability has been determined with and without the ‘Tickitape’ foil tape applied so that the effect of the tape can be assessed.

3.2 Water Permeability

The water permeability has been determined by testing to the requirements of ETAG 026 Part 1 : “General”, Clause 2.4.4 and ETAG 026 Part 3 “Linear Joint and Gap Seals”, Clause 2.4.4, which requires testing to Annex C.1 and C.2 of ETAG 026 Part 3.

Annex C.1 is for external uses and requires testing to BS EN 12155 : 2000 “Curtain walling – Watertightness – Laboratory test under static pressure” and classify to BS EN 12154 : 2000 “Curtain walling – Watertightness – Performance requirements and classification”, with the requirement that the joint seal length shall be a minimum of 1m. The seal has been tested to Class R7 of BS EN 12154 : 2000. The watertightness test has been performed on test specimens with and without the ‘Tickitape’ foil tape applied over the joints. Diagram 1 shows the test sample configuration with the tape applied.

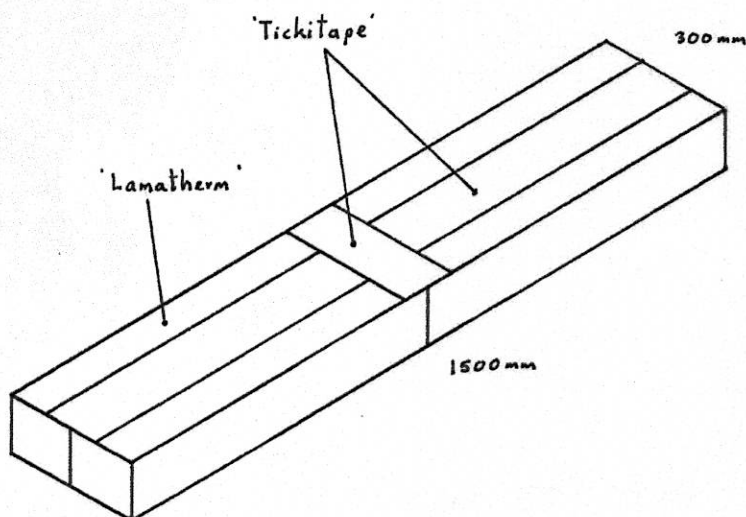


Diagram 1.

Annex C.2 is for internal use and the test procedure within C.2 has been followed. The test specimen is of the same configuration as for C.1 except that the specimen size is 1100mm by 250mm. The test has been carried out with water depth of 5, 10, 15, 20, 25 and 30mm, which is equivalent to 50, 100, 150, 200, 250 and 300 Pa.

4 RESULTS

The results are only valid for the specimens tested.

4.1 Air Permeability

Specimen Size : 1500mm by 300mm

Joint Length : 1800mm

Conditioned at : 23±3°C

Test Conditions : 15.8±0.2°C, 75±2% rh, 982±2kPa

Airflow measurement device : Airflow Instruments HVL T Mk 4 M(120V) in conjunction with Airflow Instruments LM1 'Leakage Manager'

4.1.1 Air Permeability without 'Tikitape' foil tape applied

Pressure, Pa	Air Flow Measurement, m ³ /hr		Air Permeability	
	Measured, V _x	Corrected, V _o	Per metre length of joint, m ³ /hr.m	Over area of specimen, m ³ /hr.m ²
50	2.78	2.72	1.51	6.04
100	5.33	5.24	2.91	11.64
150	8.28	8.14	4.52	18.09
200	10.91	10.72	5.96	23.82
250	12.51	12.29	6.83	27.31
300	15.77	15.49	8.61	34.42
450	23.21	22.79	12.66	50.64
600	31.10	30.55	16.97	67.89

$$\text{Where } V_o = V_x \times \frac{293}{273+T_x} \times \frac{P_x}{101.3}$$

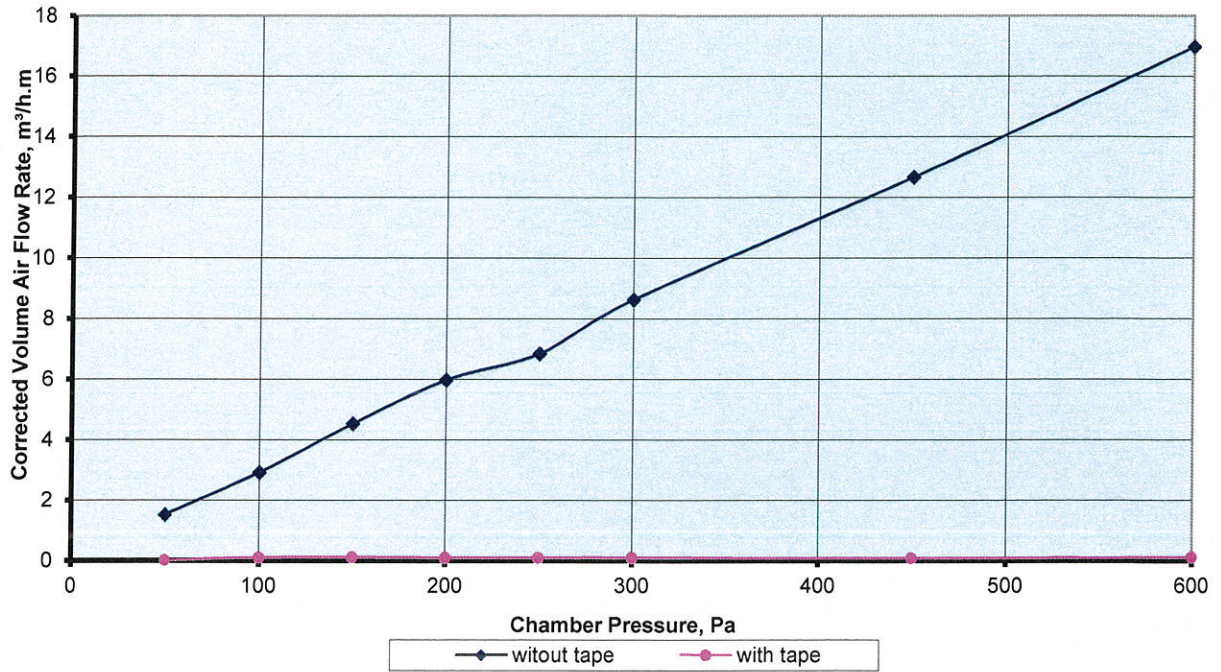
Where T_x = Temperature at test in °C

P_x = Atmospheric Pressure in kPa

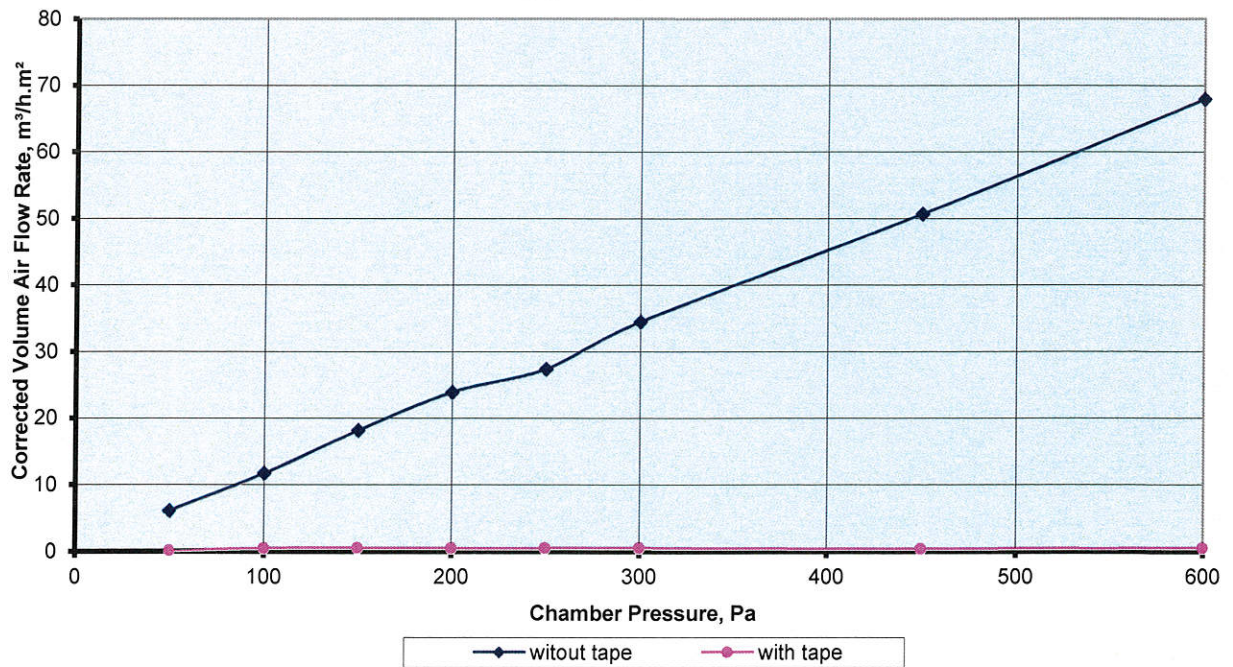
4.1.2 Air Permeability with 'Tickitape' foil tape applied

Pressure, Pa	Air Flow Measurement, m ³ /hr		Air Permeability	
	Measured, V_x	Corrected, V_o	Per metre length of joint, m ³ /hr.m	Over area of specimen, m ³ /hr.m ²
50	0.02	0.02	0.01	0.04
100	0.18	0.18	0.10	0.40
150	0.20	0.20	0.11	0.44
200	0.16	0.16	0.09	0.36
250	0.16	0.16	0.09	0.36
300	0.16	0.16	0.09	0.36
450	0.13	0.13	0.07	0.29
600	0.18	0.18	0.10	0.40

Air Permeability per metre length of joint



Air Permeability per square metre of area



4.2 Water permeability**4.2.1 'External use'****4.2.1.1 Watertightness without 'Tickitape' foil tape applied**

Pressure, Pa	Time, Minutes	Water Leakage
0	15	None
50	5	None
100	5	None
150	5	None
200	5	None
300	5	None
450	5	None
600	5	None

4.2.1.2 Watertightness with 'Tickitape' foil tape applied

Pressure, Pa	Time, Minutes	Water Leakage
0	15	None
50	5	None
100	5	None
150	5	None
200	5	None
300	5	None
450	5	None
600	5	None

4.2.2 'Internal use'

The test was set up with the taped joint 1350mm long and was covered to a depth of 5, 10, 15, 20, 25 and 30mm with water, this is equivalent to 50, 100, 150, 200, 250 and 300Pa water pressure. This was maintained for 72 hours at each water depth.

Water Depth, mm	Time, Hours	Water Leakage
5	72	None
10	72	None
15	72	None
20	72	None
25	72	None
30	~1/2	Water drips

5 Conclusions

A sample of Siderise CW-FS Perimeter Barrier and Fire Stop System taped joints has been tested for Air and Water Permeability in accordance with the requirements of EOTA ETAG 026 "Guidance for European Technical Approvals for Fire Stopping and Fire Sealing Products".

The maximum air permeability of the Siderise CW-FS Perimeter Barrier and Fire Stop System taped joints is 0.11 m³/hr.m length of taped joint and 0.44 m³/hr.m² of sample area. This compared to 16.97 m³/hr.m length of joint and 67.89 m³/hr.m² of sample area without the Siderise CW-FS Perimeter Barrier and Fire Stop System tape applied.

The Siderise CW-FS Perimeter Barrier and Fire Stop System taped joints have been subjected to the 'External Use' and 'Internal Use' water permeability tests within Annex C of ETAG 026 Part 3. In the 'External Use' test the system was successfully tested to Class R7 as defined within BS EN 12154. That is no water leakage occurred at pressures up to 600 Pa.

In the 'Internal Use' test the system was watertight at a water depth of 25mm of water pressure, which is watertight to 250 Pa.

Reported & Authorised by.....*R. Fryer*
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