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BS 6375-1:2015

Test of: Flamebreak 430 – Single door – Door type 1

Performance of windows & doors - Part 1: Weathertightness

A Report To:
Pacific Rim Wood Ltd
Ground Floor Suite, block B, Old Kelways, Somerton Road, Langport,
Somerset. TA10 9SJ

Document Reference:
WIL 501507-1

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Element Materials Technology Wednesbury Limited
Fire & Building Products
Registered in England & Wales
Registered Office: 10 Lower Grosvenor Place, London, SW1W 0EN, United Kingdom
Company Registration No: 11446650

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TEST CONCLUSIONS

Samples of:

Manufacturer	Pacific Rim Wood Ltd
Product	Flamebreak
Model	Flamebreak 430 – Single door – Door Type 1

have been tested in accordance with: BS6375-1:2015
By Element Materials Technology, a UKAS accredited Testing Laboratory (No. 0621)

At Unit 3 Wednesbury One, Black Country New Road, Wednesbury, WS10 7NZ.
Results and comments as detailed below:

Clause No.	Description	Classification
4	**Exposure category and classification**	**800U**
6	Test for air permeability (to EN1026)	CLASS 3
7	Test for watertightness (to EN1027)	CLASS 0
8	Test for resistance to wind (to EN12211)	CLASS C3

No inferences can be made regarding performance against other requirements of this standard

Tests marked " N/A" are not applicable to the sample under test.
Tests marked "N/T" were not applied to the sample under test

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AUTHORISATION

Tests performed by: Calum Brown, Thermal Test Engineer

Report issued by: Chris Bryan, Senior Test Engineer

Signed

Date 10/12/2021

For and on behalf of Element Materials Technology

Report authorised by: Mark Garfield, Door & Window Laboratory Manager

Signed

Date 10/12/2021

For and on behalf of Element Materials Technology

Report issued: 13 December 2021

UKAS TESTING
0621

NOTE.
Tests marked “Not UKAS Accredited” are not covered by the Laboratory UKAS accreditation schedule.

The laboratory has tested the product supplied by the client as sampled in accordance with their own requirements

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TEST DETAILS

CLIENT DETAILS

Company name	Pacific Rim Wood Ltd
Address	Ground Floor Suite, Block B, Old Kelways, Somerton Road, Langport, Somerset, TA10 9SJ`
Contact	Shaun Hannan

ORDER DETAILS

Order number	PRW/PAS24/GPM
Dated	26/01/2021

SAMPLE DETAILS

Outer frame	1025 x 2246 x 110mm
Opening joint	931 x 2151 x 44mm
Configuration	Inward-opening single timber doorset
Material	Timber
Details of Hardware	
Hinges	4No. NICO Manufacturing LTD NICO Security Hinge Ref: 53150R10SEC
Lock	Winkhaus GmbH & Co Multipoint lock. Ref: Winkhaus AV2 F2070
Cylinder	ERA 35/35 Key/Thumbturn. Ref: BS-L-T3535-51
Handles	Winkhaus GmbH & Co Lever Handles With Face Plates Ref: Winkhaus Melbourne 1672/2390N – ZA/3816N

TEST DETAILS

Test specification	BS 6375-1:2015 Performance of windows & doors
Full test	Yes
Test to clauses	N/a
Test methods	BS EN 1026:2016 Windows & Doors - Air Permeability BS EN 1027:2000 Windows & Doors – Watertightness BS EN 12211:2016 Windows & Doors - Resistance to wind
Sample received	08/03/2021
Test started	10/03/2021
Test completed	10/03/2021
Special Test requirements	None
Other reports to be used in conjunction with this report	None
Airflow measurement device used	KS5040 Weathertightness test rig (P1691)

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TEST PROCEDURE

Introduction	This test report should be read in conjunction with the Standard BS 6375-1:2015, Performance of Windows & Doors – Part 1: Classification for weathertightness and guidance on selection and specification. The specimens were judged on their ability to comply with the performance criteria as required in BS EN 1026:2016, classified in accordance with BS EN 12207:2016, BS EN 1027:2000, classified in accordance with BS EN 12208:2000 and BS EN 12211:2016, classified in accordance with BS EN 12210:2016.
Instruction To Test	Initial requirement was for a performance of Class 2 (300 Pa) for air permeability, Class 3A (100 Pa) for watertightness, and Class A3 (1200 Pa) for wind resistance, appropriate to a UK exposure category of 1200.
Test Specimen Construction	A description of the test construction is given in the Schedule of Components. The description is based on a survey of the specimens and information supplied by the client.
Installation	The doorset was supplied mounted within a timber sub-frame of nominal section 75 x 100mm fitted flush with the exterior face, in accordance with the clients fitting instructions. The sample was set to the locked condition as defined by the client.
Sampling	The samples were not independently witnessed or selected and were provided direct from the client.
Test Climate	The sample was conditioned in the laboratory in the range 15-30°C and 25-75% humidity. The temperature and humidity in the lab was maintained in the range 18.3-21.7°C and 34-44.2% humidity for the duration of the test. The air pressure was 98.0 kPa.

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INITIAL OBSERVATIONS

The internal face of the sample

Handle

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Top hook bolt

Dead bolt

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Bottom hook bolt

Bottom/top keep

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Centre keep

Hinge with integrated dog bolt

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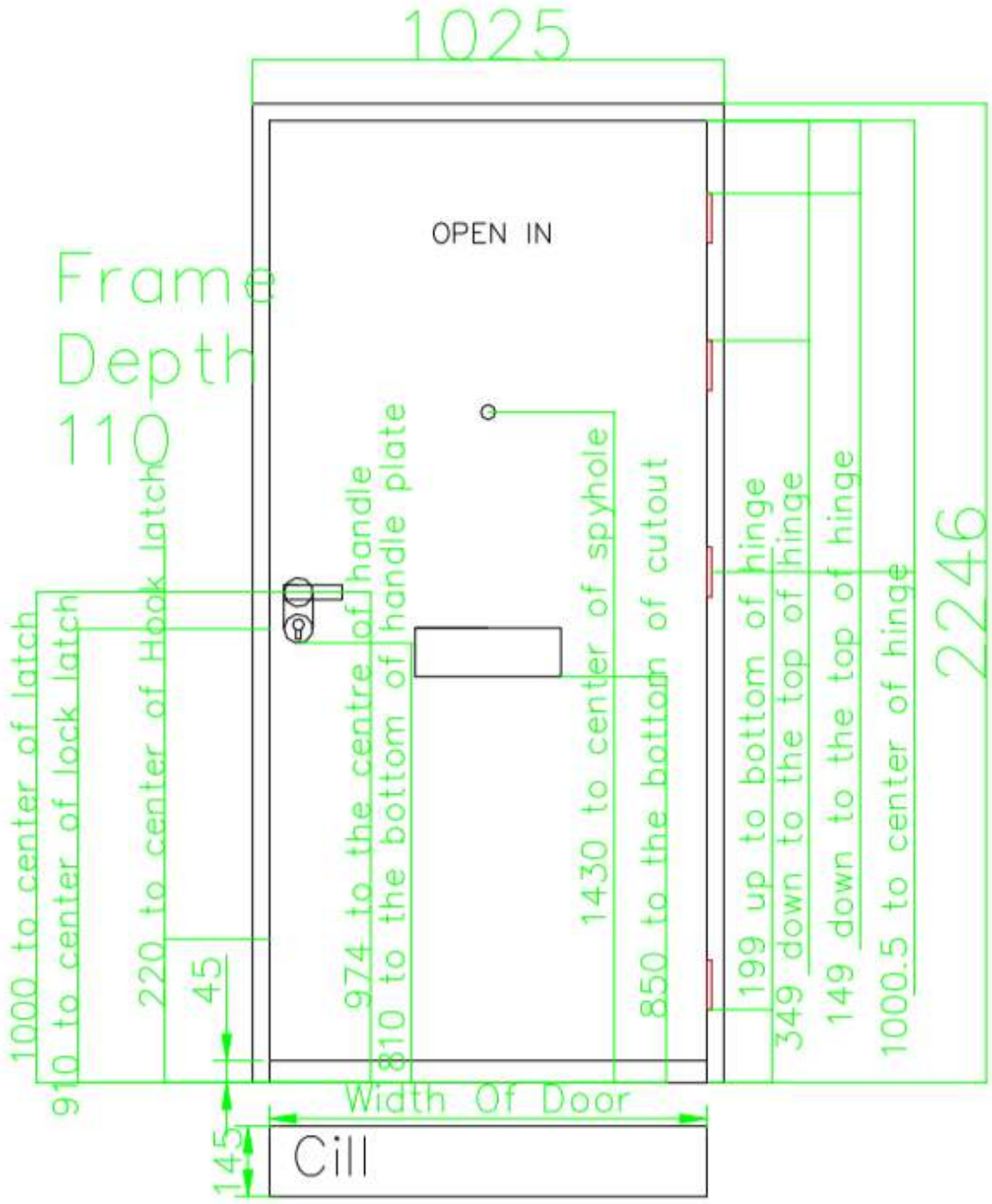
TEST SPECIMEN

Figure 1- General Elevation of Test Specimen (External Face)



Do not scale. All dimensions are in mm

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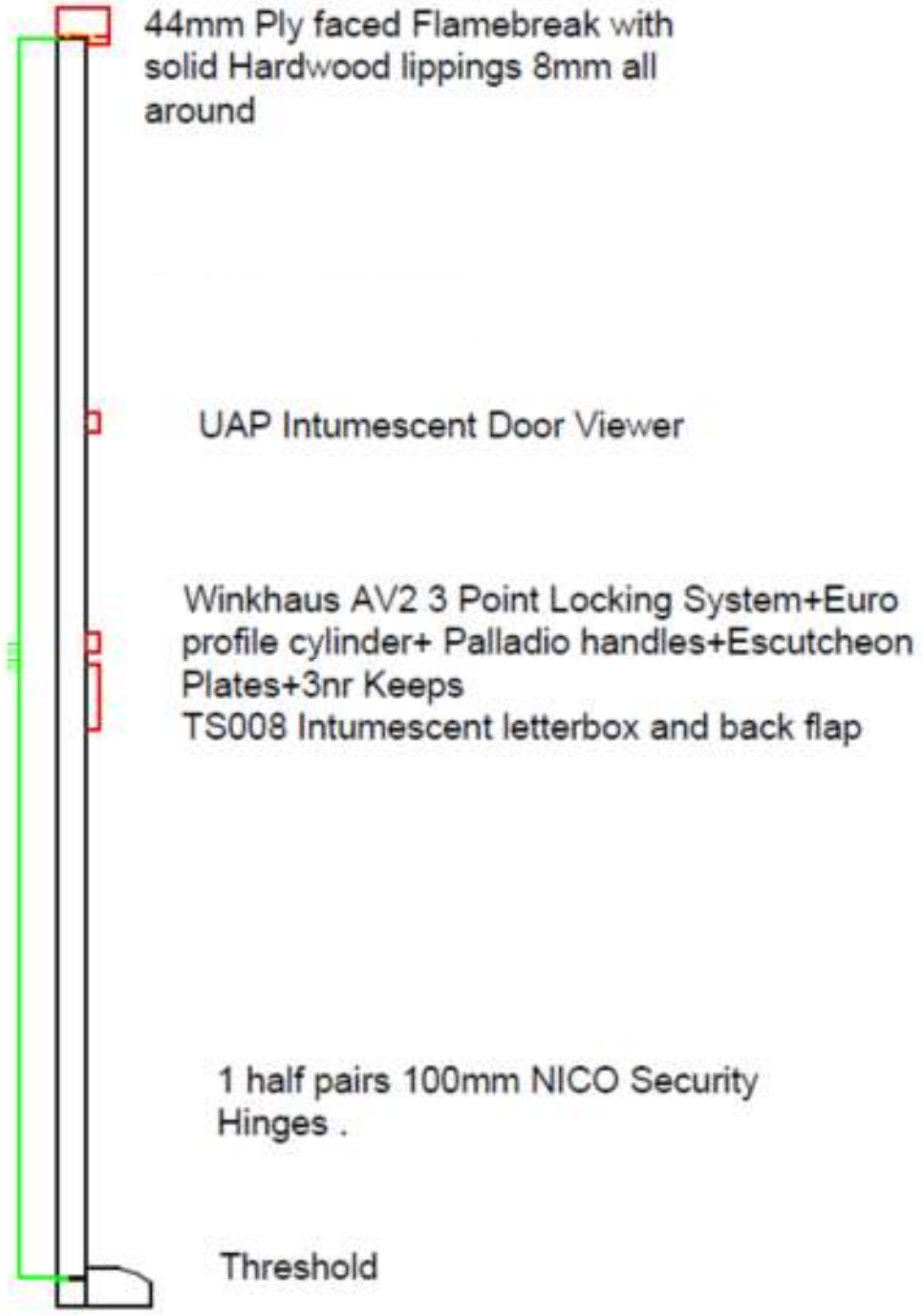
Figure 2 – Horizontal section

Do not scale. All dimensions are in mm

Figure 3 – Vertical section



Do not scale. All dimensions are in mm

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SCHEDULE OF COMPONENTS

Refer to Figures 1 to 3
All values are nominal unless stated otherwise
The schedule of components is based on a survey of the specimens and information supplied by the client.

Variants

None

Item		**Description**
1. Door frame head		
Reference	:	Custom
Material	:	Sapele
Density	:	661.52 kg/m^3 (stated)
Section size	:	110 mm wide x 59 mm thick
Rebate	:	50 mm wide x 15 mm deep integral with frame
Fixing jamb to head joints	:	Rebated butt joint
i. type	:	Wood screws
ii. size	:	5.0mm diameter x 100mm long
iii. quantity	:	6no / frame (3no for each joint)
Details of adhesive		
i. supplier	:	Timbond Professional
ii. reference	:	PVA wood adhesive D3 water resistant
2. Door frame jamb		
Reference	:	Custom
Material	:	Sapele
Density	:	661.52 kg/m^3 (stated)
Section size	:	110 mm wide x 59 mm thick
Rebate	:	50 mm wide x 15 mm deep integral with frame
3. Door frame sill		
Reference	:	Custom
Material	:	Sapele
Density	:	661.52 kg/m^3 (stated)
Section size	:	145 mm wide x 60mm high
Rebate	:	50 mm wide x 15 mm deep integral with frame
Fixing jamb to sill joints	:	Butt joint
i. type	:	Wood screws
ii. size	:	5.0mm diameter x 100mm long
iii. quantity	:	6no / frame (3no for each joint)
Details of adhesive		
i. supplier	:	Timbond Professional
ii. reference	:	PVA wood adhesive D3 water resistant

Item		Description
4. Door frame weather seals		
Description	:	Aquamac 21 draught strip seal
Manufacturer	:	Schlegel
Reference	:	
Fixing method	:	Slot into a pre-cut groove in the rebate
Position	:	All four rebated edges
Continuity	:	Uninterrupted by hardware
5. Door frame intumescent/smoke seals		
Description	:	15mm wide x 4mm thick intumescent brush strip
Manufacturer	:	Pyroplex
Reference	:	
Fixing method	:	Self adhesive
Position	:	In both jambs and head of frame; present in the bottom of the leaf as well
Continuity	:	Interrupted by hardware. All hardware items have intumescent pads behind them
6. Door leaf		
Supplier/manufacturer	:	Flamebreak 430 – Pacific Rim Wood Ltd
Overall leaf size		
i. active leaf	:	931 x 2151 x 44mm
7. Door leaf internal framing		
Material	:	Mixed Tropical hardwood
Density	:	Approx. 480 kg/m^3 (stated)
Core section size	:	3 layer Falcatta core – each layer = 12.3mm thickness with lamels of width :- 36mm/40mm/42mm/45mm/47mm/54mm/56mm dependent on raw material availability.
Doorleaf framing section sizes		
i. stile	:	36mm thick x 35mm deep – incorporating a 9mm x 9mm tongue
ii. top rail	:	36mm thick x 35mm deep – incorporating a 9mm x 9mm tongue
iii. bottom rail	:	36mm thick x 35mm deep – incorporating a 9mm x 9mm tongue
Details of adhesive		
i. supplier	:	Pamolite Adhesive Industries
ii. reference	:	Type 1 Melamine glue
8. Door leaf core		
Supplier/manufacturer	:	Flamebreak 430
Material	:	Albisia Falcatta – Trilaminate core
Density	:	140 – 360 kg/m^3 (stated)
Thickness	:	35mm
Fixing into rebate	:	N/A

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Item		Description
9. Door leaf facings		
Material	:	Nominal 4mm Ply Faced both sides
Density	:	Average 575 kg/m^3 (stated)
Thickness	:	Nominal 4mm
Details of adhesive		
i. supplier	:	Pamolite Adhesive Industries
ii. reference	:	Type 1 Melamine glue
10. Door leaf lippings		
Position	:	Fitted to two long edges, top and bottom
Material	:	Sapele
Density	:	Min 640kg/m3 (Stated)
Section size	:	44mm wide x 8mm thick
Details of adhesive		
i. supplier	:	Adkwick
ii. reference	:	Kleiberit 707.6
11. Hinges		
Supplier/manufacturer	:	NICO Manufacturing LTD
Description	:	NICO security hinge
Reference	:	53150R10SEC
Primary material	:	Steel
Size of knuckle	:	14mm diameter x 107mm high
Size of blades	:	102mm high x 31mm wide x 3mm thick
Quantity	:	4no hinges / leaf
Intumescent protection (if applicable)	:	2no 1mm thick x 100mm long x 30mm wide radius NOR910 Norsound intumescent pad. One applied between the hinge blade and frame and the other one between the other hinge blade and the leaf
Position of hinges		
i. top hinge	:	149mm from top of door to top of hinge
ii. middle hinge	:	954.5mm from top of door to top of hinge
iii. bottom hinge	:	1850mm from top of door to top of hinge
iv second hinge from the top		349mm from top of door to top of hinge
Fixing hinge to doorleaf		
ii. type	:	Wood screw
iii. size	:	4.5mm diameter x 30mm long
iv. quantity	:	4no
Fixing hinge to frame		
i. type	:	Wood screw
ii. size	:	4.5mm diameter x 30mm long
iii. quantity	:	4no

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Item		Description
12. Lock		
Supplier/manufacturer	:	Winkhaus GmbH & Co
Description	:	Multipoint lock
Reference	:	Winkhaus AV2 F2070
Face plate size	:	1770mm high x 20mm wide x 3mm thick
Intumescent protection (if applicable)	:	Interdens 1mm OFFICIAL Winkhaus AV2 kit lock protection
Position	:	974mm from bottom of door to centre of spindle
Fixings		
i. type	:	Wood screw
ii. size	:	3.5mm diameter x 50mm long
iii. quantity	:	12no
13. Lock Keeps		
Supplier/manufacturer	:	Winkhaus GmbH & Co
Reference		
i. top & bottom keeps	:	STVSBAV2
ii. centre keep	:	STVSBFR24
Material	:	Stainless steel
Intumescent protection (if applicable)	:	Interdens 1mm OFFICIAL Winkhaus AV2 kit keep protection
Overall size		
i. top & bottom keeps	:	175mm high x 24 mm wide x 2 mm thick
ii. centre keep	:	234mm high x 24 mm wide x 2 mm thick
Fixing keeps to frame		
i. type	:	Wood screw
ii. size	:	3.5mm diameter x 35mm long
iii. quantity	:	4no 3.5mm thread diameter x 35mm long for top/bottom keep 3no 3.5mm thread diameter x 35mm long for centre keep
14. Cylinder		
Supplier/manufacturer	:	ERA
Description	:	35/35 key/thumbturn
TS007 (if applicable)	:	Yes
Reference	:	BS-L-T3535-51
Overall size	:	34 mm high x 17 mm wide x 70 mm long euro profile
Fixings		
i. type	:	M5 Machine Screw
ii. quantity	:	1 No.

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Item		Description
15. Lever handles		
Supplier/manufacturer	:	Winkhaus GmbH & Co
Description	:	Lever handles with face plates
Reference	:	Winkhaus Melbourne 1672/2390N – ZA/3816N
TS007 certification ref (if applicable)	:	
Material	:	Aluminium
Overall size	:	External face plate: 258 mm high x 34 mm wide x 15 mm thick x 4 mm cylinder incorporated escutcheon projection Internal face plate: 258 mm high x 34 mm wide x 10 mm thick
Lever length	:	Handles: 30mm high x 135mm wide x 65mm projection
Fixings		
i. type	:	Steel bolts
ii. size	:	5.0mm diameter x 60mm long
iii. quantity	:	3no
16. Door viewer		
Supplier/manufacturer	:	UAP Limited
Description	:	14mm Wide angle door viewer
Reference	:	
Overall size	:	14 mm Ø with 22 mm Ø to unexposed face, 26 mm Ø to exposed face
Door hole size	:	16.4mm
Intumescent protection (if applicable)	:	45mm long x 40mm wide x 1mm thick reinforced bespoke intumescent jacket rolled and inserted in the aperture prior to the door viewer being installed
Fixing height (centre of viewer)	:	1430mm from bottom of door
17. Letter Plate		
Supplier/manufacturer	:	UAP Limited
Description	:	Soterian TS008 letterplate
TS008 (if applicable)	:	Yes
Reference	:	
Aperture size	:	External size 40 mm high x 259.5 mm wide Internal size 55 mm high x 259.5 mm wide
Door slot size	:	
Fixing height	:	850mm up to bottom of aperture
Cowl	:	115 mm high x 305 mm wide x 6 mm thick x 35 mm projection
Intumescent protection (if applicable)	:	Bespoke intumescent protection pre-fitted on internal framing and external face plate
Fixings		
i. type	:	Various screws and bolts provided in the letter plate kit

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PERFORMANCE CRITERIA & TEST RESULTS

Clause 4 Exposure category and classification

Exposure Category Required:	800U
Atmospheric Conditions	
Air Temp	19.8°C
Humidity	44.3%RH
Air Pressure	98kPa
Test Sample	
Overall Size of Sample	1025 x 2246mm
Overall Area	2.3m2
Joint length leaf	931 x 2151mm
Opening Joint Length (m)	6.16m

The temperature and barometric pressure readings above were used to convert the air permeability results to standard conditions.

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Clause 6 Air Permeability

Test Pressure	Calculated Air Permeability per unit length		
	Positive m^3 / h.m	Negative m^3 / h.m	Average m^3 / h.m
50 Pa	0.64	0.56	0.60
100 Pa	1.06	0.93	1.00
150 Pa	1.45	1.23	1.34
200 Pa	1.78	1.48	1.63
250 Pa	2.12	1.72	1.92
300 Pa (if required)	2.45	1.92	2.19
450 Pa (if required)	3.49	2.47	2.98
600 Pa (if required)	4.49	2.91	3.70

Test Pressure	Calculated Air Permeability per unit area		
	Positive m^3 / h.m	Negative m^3 / h.m	Average m^3 / h.m
50 Pa	1.70	1.51	1.60
100 Pa	2.85	2.50	2.67
150 Pa	3.87	3.28	3.58
200 Pa	4.77	3.96	4.36
250 Pa	5.68	4.59	5.14
300 Pa (if required)	6.57	5.15	5.86
450 Pa (if required)	9.35	6.61	7.98
600 Pa (if required)	12.03	7.79	9.91

Note:

The instrument used for measuring air permeability is only calibrated in the range 0-300m^3/h. Measurements above 300m^3/h are therefore outside of the calibrated range for the instrument. Affected results are marked with a #.

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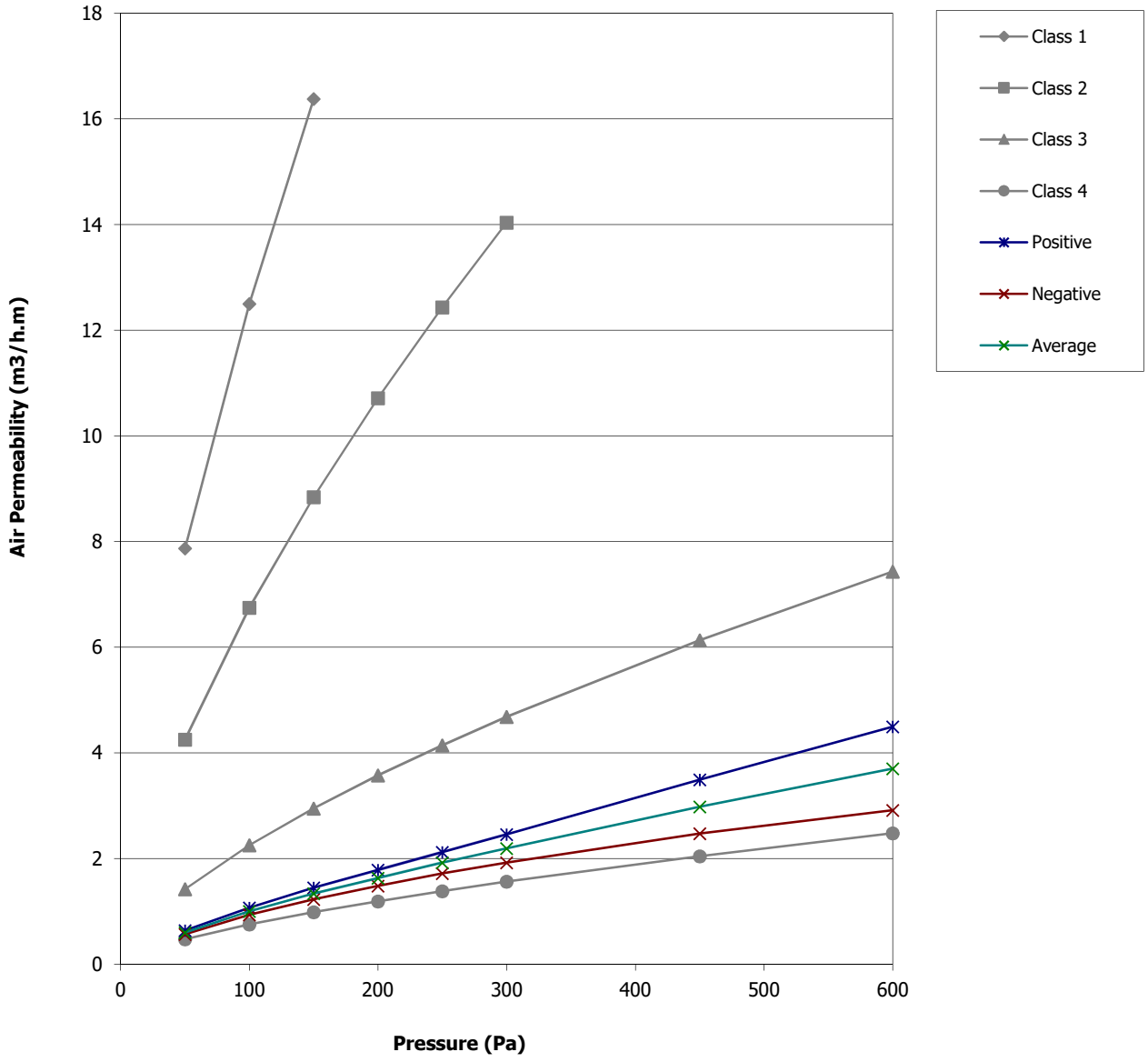
Graph of air permeability per unit length



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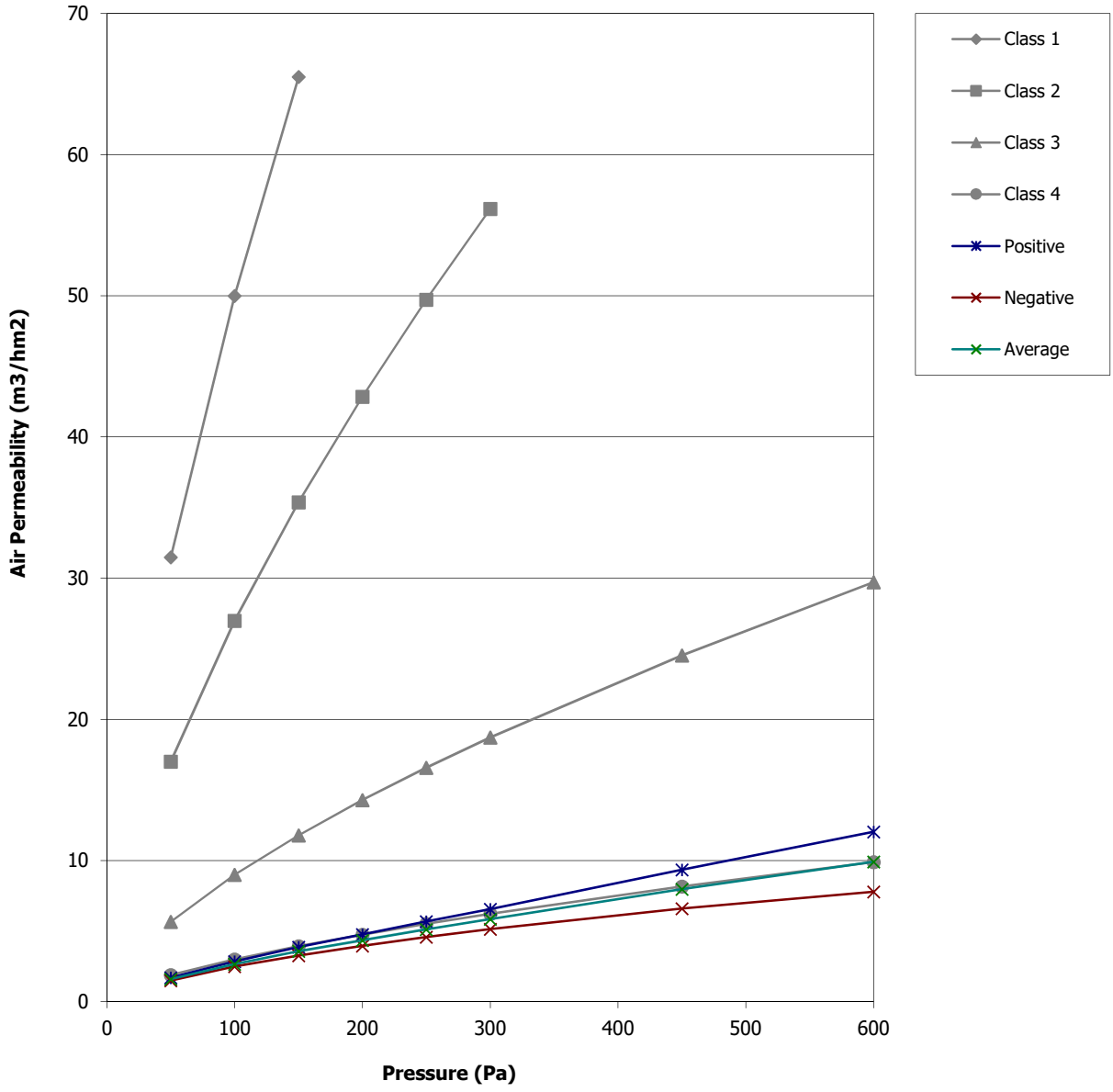
Graph of air permeability per unit area



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Clause 7 Watertightness

Quantity of 2 l/min nozzles (row 1)	3
Quantity of 1 l/min nozzles (row 2)	0
Total water quantity	6 l/min
Spraying method	A
Distance of nozzles from sample (250mm +10 –0mm)	250mm
Angle of nozzles (24° +2° - 0°)	24°
Height of nozzle above joint (0 – 150mm)	0mm

Pressure (Pa)	Duration (m:s)	Observations	
0 PA	3mins	Bottom of the hinge side	FAILED CLASS 1A

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Clause 7 Watertightness test observations

Continuous and repeated water penetration at the bottom of the hinge after 3m 0s at 0 Pa

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Clause 8 Wind Resistance

Members chosen for deflection measurement

Positive wind pressure

Member tested	Pressure applied	Measured Length	Deflection	Fraction
Locking edge	1207 Pa	2130 mm	1.75 mm	1/1217

Negative wind pressure

Member tested	Pressure applied	Measured Length	Deflection	Fraction
Locking edge	-1202 Pa	2130 mm	1.35 mm	1/1578

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Clause 6 Repeated Air Permeability following wind resistance test

Test Pressure	Calculated Air Permeability per unit length		
	Positive m^3 / h.m	Negative m^3 / h.m	Average m^3 / h.m
50 Pa	0.50	0.49	0.50
100 Pa	0.87	0.79	0.83
150 Pa	1.20	1.04	1.12
200 Pa	1.48	1.27	1.38
250 Pa	1.77	1.47	1.62
300 Pa (if required)	2.08	1.63	1.85
450 Pa (if required)	2.88	2.12	2.50
600 Pa (if required)	3.66	2.50	3.08

Test Pressure	Calculated Air Permeability per unit area		
	Positive m^3 / h.m	Negative m^3 / h.m	Average m^3 / h.m
50 Pa	1.35	1.30	1.33
100 Pa	2.33	2.12	2.23
150 Pa	3.22	2.78	3.00
200 Pa	3.97	3.40	3.69
250 Pa	4.73	3.93	4.33
300 Pa (if required)	5.57	4.36	4.96
450 Pa (if required)	7.72	5.66	6.69
600 Pa (if required)	9.81	6.69	8.25

Note:

The instrument used for measuring air permeability is only calibrated in the range 0-300m^3/h. Measurements above 300m^3/h are therefore outside of the calibrated range for the instrument. Affected results are marked with a #.

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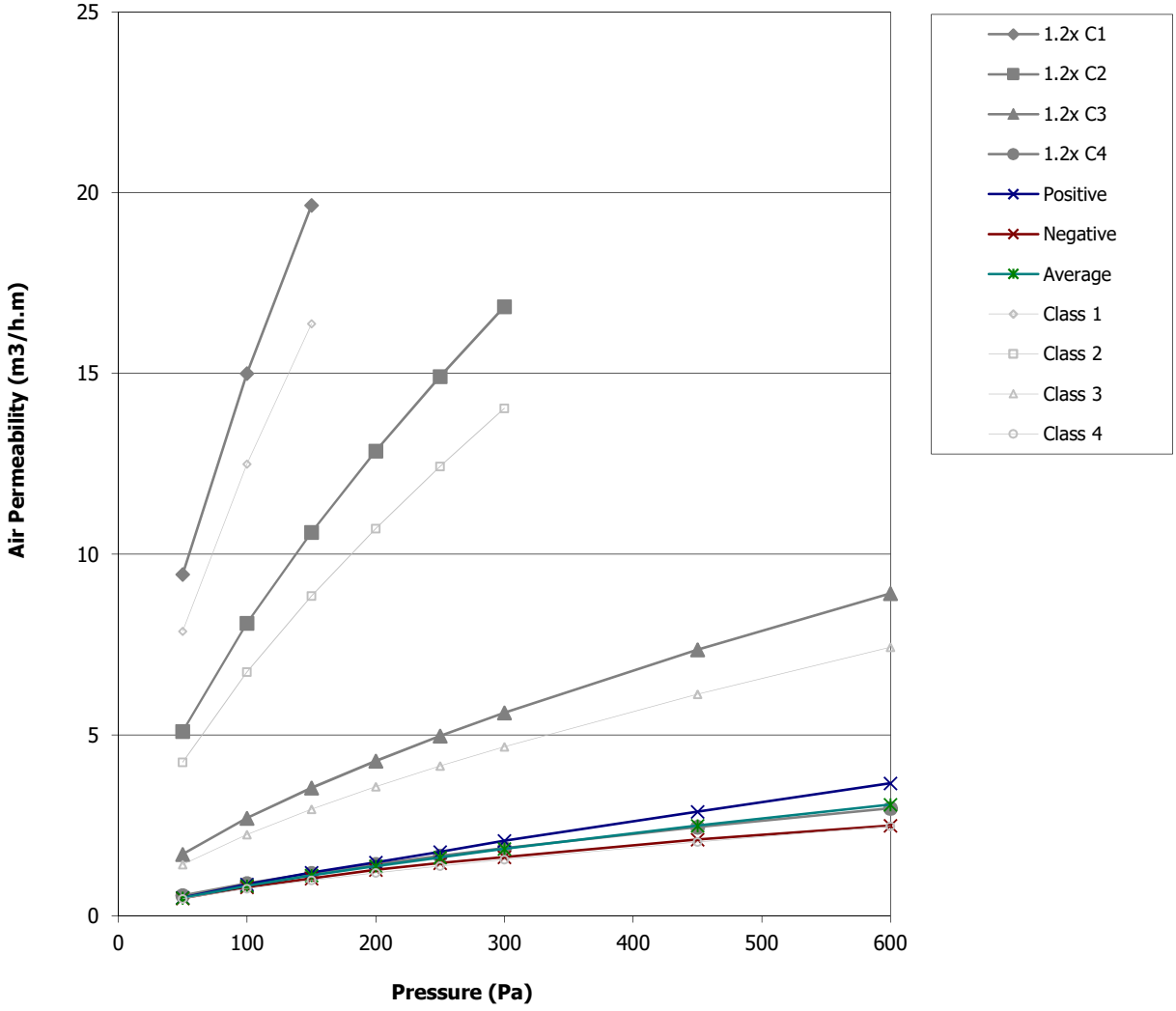
Graph of air permeability per unit length following wind resistance test



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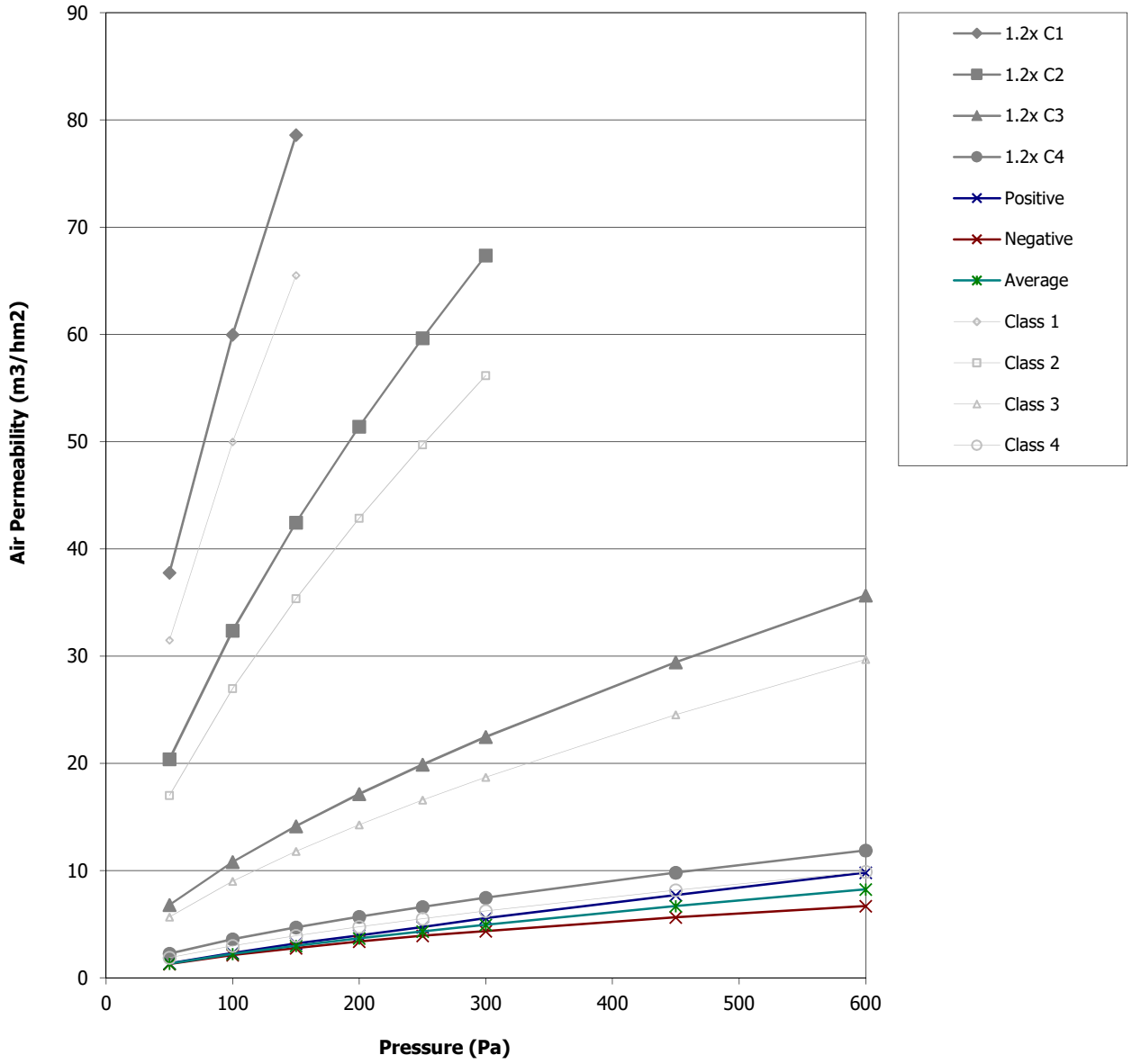
Graph of air permeability per unit area following wind resistance test



Clause	Result	Pass/Fail
6 Test for air permeability	BS6375-1 requires a performance of Class 2 defined in BS EN 12207 for UK exposure category 1200. The client's initial requirement was for Class 2. The sample was tested in accordance with BS EN 1026 in the locked condition as requested by the client. The air leakage per unit area and per unit joint length should be less than those for the required class. When positive and negative pressure was applied the average air leakage per unit joint length met the requirements of Class 3, and per unit area met the requirements of Class 3. During the repeat air permeability test the average air leakage had decreased to Class 4. **The sample could therefore be classified as Class 3 for the air permeability test.**	**PASS CLASS 3**
7 Test for water tightness	BS6375-1 requires a performance of Class 3A, defined in BS EN 12208 for UK exposure category 1200. The client's initial requirement was for Class 3A. The sample was tested in accordance with BS EN 1027, with spray method 1A, in the locked condition as requested by the client. There should be no continuous water penetration onto the internal face of the specimen at the required test pressure. These requirements were satisfied up to a point 3min and 0sec into a test pressure of 0 Pa when water penetration was observed Bottom of the hinge side. **The sample could therefore be classified as Class 0 for the watertightness test.**	**PASS CLASS 0**

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Clause	Result	Pass/Fail
8 Test for resistance to wind - Deformation test	BS6375-1 requires a performance of Class A3, defined in BS EN 12210, for UK exposure category 1200. The client's initial requirement was for Class A3. The sample was tested in accordance with BS EN 12211 in the locked condition as requested by the client. For Class A3 the test pressure P1 to be applied is 1200Pa, and the frontal displacement following the positive and negative pressure test should be less than 1/150th of the length of the member tested. For positive pressure the member tested was the Locking edge, it was 2130mm long, and was subject to a maximum deflection of 1.75mm (1/1217) for positive wind pressure. For negative pressure the member tested was the Locking edge, it was 2130mm long, and was subject to a maximum deflection of 1.35mm (1/1578) for negative wind pressure. The sample met the requirements for Class C3 for the deflection test.	**PASS**
Repeated pressure test	No visible failures should occur during the repeated air test, and the resultant air permeability should not exceed the upper limits of the claimed class by 20%. Following a test pressure P2 of -600Pa and 600Pa repeated 50 times there were no visible failures. The air permeability of the sample had decreased to Class 4, and the sample met the requirements of Class C3 for the repeated pressure test.	**PASS**
Safety test	During the safety test under a pressure P3 of -1800Pa & 1800Pa the sample must remain closed and no parts must come detached. On the application of the test pressure the sample remained closed The sample met the requirements for Class C3 for the safety test. **The sample could therefore be classified as Class C3 for the wind resistance test.**	**PASS CLASS C3**

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CONCLUSIONS

Evaluation against objective	The sample as provided by the client was subjected to weather performance testing in accordance with BS 6375-1:2015,and achieved a performance of Class 3 for air permeability, Class 0 for water tightness, and Class C3 for wind resistance. The sample could therefore be classified as 800U in accordance with BS6375-1.
Observations & comments	

LIMITATIONS

Limitations

The results relate only to the behaviour of the specimens of the element of construction under the particular conditions of test. They are not intended to be the sole criteria for assessing the potential performance of the element in use, nor do they reflect the actual behaviour in use.

Range of assemblies covered by this report

Table E.1 of BS EN 14351-1:2006 +A2:2016 states that the range of direct application of window assemblies covered by this report is limited to the following:

- For wind load: -100% of frame width and height of test specimen
- For water tightness: -100% to +50% of test specimen overall area
- For air permeability: -100% to +50% of test specimen overall area

Table E.2 of BS EN 14351-1:2006 +A2:2016 states that the range of direct application of doorset assemblies covered by this report is limited to the following:

- For wind load -100% of frame width and height of test specimen
- For water tightness: -100% to +50% of test specimen overall area
- For air permeability: with weather stripping on three sides -100% of test specimen overall area, with weather stripping on all four sides -100% to +50% of test specimen overall area.

Uncertainty of Measurement

The uncertainties of measurements calculated for a confidence level of 95% throughout these tests are within the limits of these tolerances.

The standards specify the following tolerances

- Air flow ± 5% (when greater than 1 m^3/h)
- Air flow ± 0.05 m^3/h (when equal to or less than 1 m^3/h)
- Air pressure ± 5%
- Water flow ± 10%
- Distance ± 5% with ± 0.1mm resolution for displacement transducers
- Distance ± 1mm for tape measures
- Temperature ± 3 ºC
- Humidity ± 5%
- Atmospheric pressure ± 1 kPa

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REVISION HISTORY

This issue of the report replaces all previous issues that are now withdrawn.

Issue No :	**Re - Issue Date :**
Revised By:	**Approved By:**
Reason for Revision:	

END OF REPORT