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BS 6375-1:2015

Test of: FD30 Single Doorset with Winkhaus Lock

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 418720

Date: 09/03/2020

Copy: 1

Issue No.: 1

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	Doorset
Model	FD30 Single Doorset with Winkhaus Lock

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 1
7	Test for watertightness (to EN1027)	CLASS 0
8	Test for resistance to wind (to EN12211)	CLASS C2

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: Wayne Pearson, Test Engineer

Report issued by: Wayne Pearson, Test Engineer

Signed

Date 27th November 2019

For and on behalf of Element Materials Technology

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

Signed

Date 09/03/20

For and on behalf of Element Materials Technology

Report issued: 09 March 2020

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	Lisa Mcgee

ORDER DETAILS

Order number	PRW/Flamebreak/Pas24/Sep19
Dated	29/08/2019

SAMPLE DETAILS

Outer frame	1000 x 2200 x 90mm
Opening joint	925 x 2145 x 44mm
Configuration	Inward-Opening Single Doorset
Material	Timber
Details of Hardware	
Hinges	4No. Union Hi Load Lift Off Hinges. Ref: JH605lolr-M-SSF
Lock	Winkhaus AV2-F 3-point lock. Ref: 2559895
Cylinder	Euro Profile Euro Cylinder. Ref: KIN 30/30 NAS
Handles	Era Fab & Fix Windsor Lever Handle. Ref: 1F302

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	06/09/2019
Test started	10/09/2019
Test completed	10/09/2019
Special Test requirements	
Other reports to be used in conjunction with this report	
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 A2 (800 Pa) for wind resistance, appropriate to a UK exposure category of 800.
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 21.6 – 23.6°C and 46.3 -57.2% humidity for the duration of the test. The air pressure was 99.8kPa.

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INITIAL OBSERVATIONS

The internal face of the sample

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Hinge

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Latch & Deadbolt

Hook

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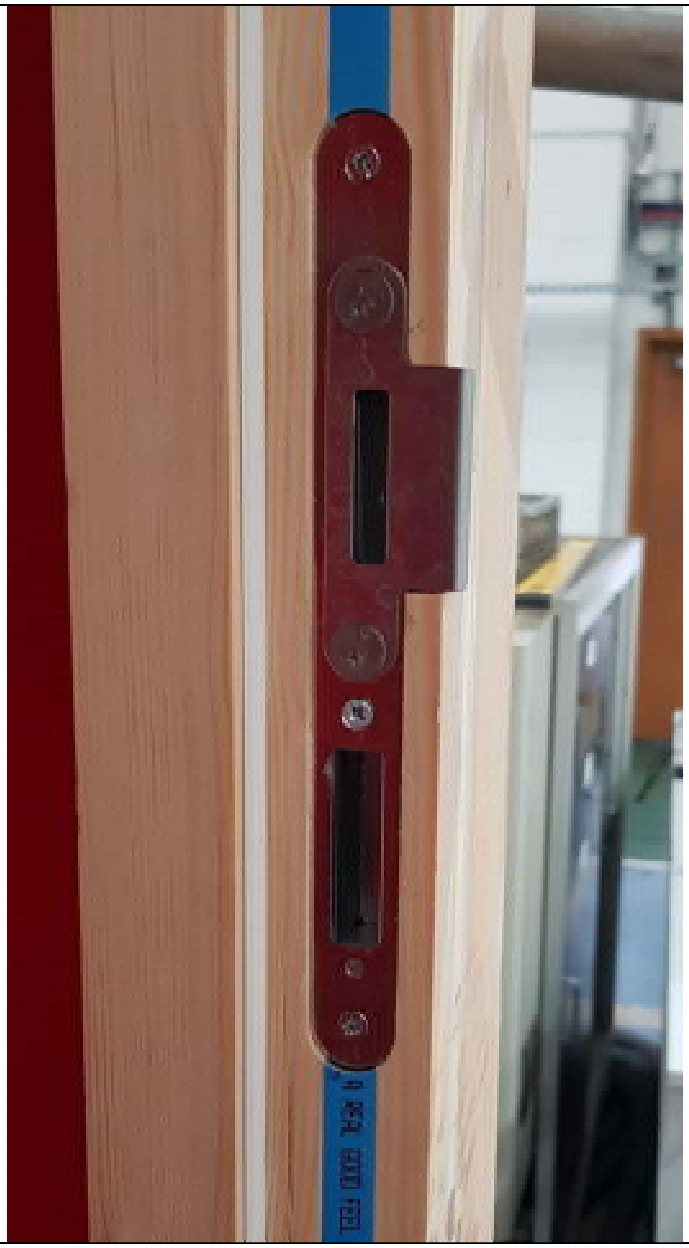
Keeps



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Handle

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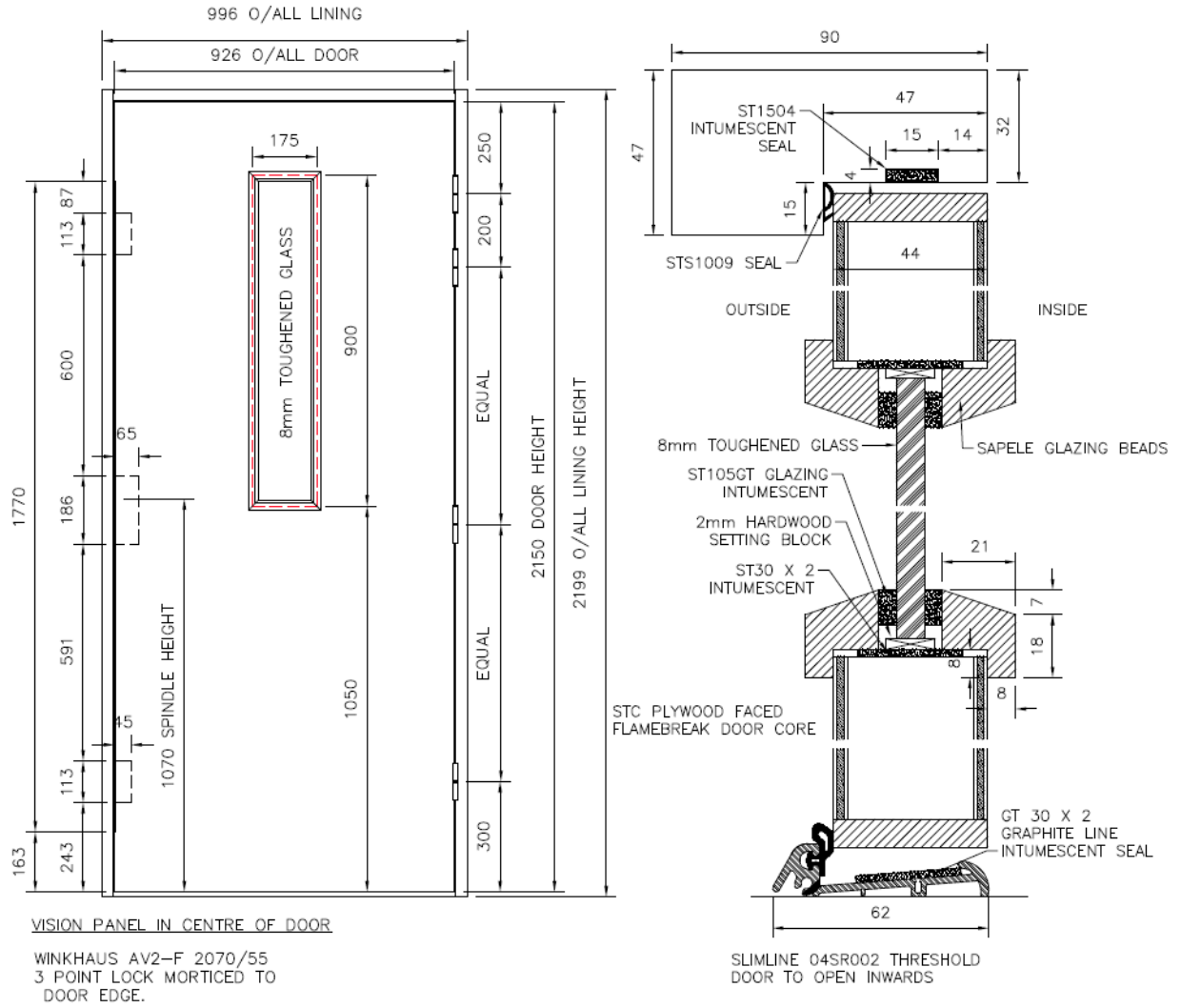
TEST SPECIMEN

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



Do not scale. All dimensions are in mm

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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		
Material	:	European Redwood
Density	:	> 450kg/m^3 (stated)
Section size	:	90 x 47mm
Rebate	:	15mm
Fixing jamb to head joints	:	Mortice & Tenon
Details of adhesive		PVA
2. Door frame jamb		
Reference	:	European Redwood
Material	:	>450kg/m^3 (stated)
Density	:	90 x 47mm
Section size	:	15mm
3. Door frame weather seals		
Description	:	Slimline 04 SR 002
Manufacturer	:	Stormguard
Reference	:	04SR002
Fixing method	:	Screw fixing to floor level
Position	:	Threshold – in between jambs
Continuity	:	Uninterrupted by hardware
4. Door frame intumescent seals		
Description	:	ST1504
Manufacturer	:	Sealed Tight solutions
Reference	:	ST1504
Fixing method	:	Connection bonded with instant adhesive
Position	:	Three edges – jambs and head
Continuity	:	Uninterrupted by hardware
5. Door frame smoke/acoustic seals		
Description	:	STS Perimeter Seal
Manufacturer	:	Sealed Tight Solutions
Reference	:	STS1009
Fixing method	:	Self-Adhesive
Position	:	Three edges (head & jambs)
Continuity	:	Uninterrupted by hardware

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Item		Description
6. Door leaf		
Supplier/manufacturer	:	Flamebreak Type 430 – Plywood faced
Overall leaf size	:	926 x 2150 x 44mm
7. Door leaf core		
Supplier/manufacturer	:	Flamebreak Type 430
Thickness	:	44mm
8. Door leaf lippings		
Position	:	Fitted to four edges
Material	:	Sapele
Density	:	>640
Section size	:	8mm
Details of adhesive	:	PUR glue, Tehcnomelt PUR Henkel
9. Door leaf weather seals		
Description	:	Slimline 04 SR 002
Manufacturer	:	Stormguard
Reference	:	04SR002
Fixing method	:	Screw fixing to floor level
Position	:	Threshold – in between jambs
Continuity	:	Uninterrupted by hardware
10. Door leaf glazed panel		
Supplier	:	AGC Pyrobelite
Thickness/configuration	:	8mm toughened glass
Overall size	:	900 x 175mm
Nominal edge clearance	:	11 overall
11. Glazing setting blocks		
Material	:	Sapele
Thickness	:	2mm
12. Glazing tape – Internal face		
Supplier	:	Sealed Tight Solutions
Reference	:	ST105 GT
Material	:	Silicone
Thickness	:	5mm
Overall size	:	10 x 5mm
Fixing method	:	Self adhesive – then sealed with silicone on top
11a Glazing Liner		
Supplier	:	Sealed Tight Solutions
Reference	:	ST30 Graphite Graphite Liner x 2
Material	:	Graphite
Thickness	:	2mm
Overall size	:	30 x 2mm
Fixing method	:	Self adhesive

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Item		Description
13. Glazing tape – External face		
Supplier	:	Sealed Tight Solutions
Reference	:	ST105 GT
Material	:	Silicone
Thickness	:	5mm
Overall size	:	10 x 5mm
Fixing method	:	Self adhesive – then sealed with silicone on top
14. Glazing beads		
Glazing method	:	Cassette beaded - cloak
Material	:	Sapele
Density	:	>640kg/m^3 (stated)
Section size	:	25 x 21mm
Fixing method	:	
i. type	:	Glazing pins
ii. size	:	50mm
15. Hinges		
Supplier/manufacturer	:	Union
Description	:	Hi Load Lift Off Hinges
Reference	:	JH605lolr-M-SSF
Primary material	:	Grade II steel
Size of knuckle	:	14mm
Size of blades	:	35 x 100mm
Quantity	:	4No.
Intumescent protection (if applicable)	:	
Position of hinges		
i. top hinge	:	204mm from top of door to top of hinge
ii. 2nd hinge		403mm from top of door to top of hinge
iii. 3rd hinge hinges	:	1102mm from top of door to top of hinge
iv. bottom hinge	:	1801mm from top of door to top of hinge
Fixing hinge to doorleaf		
i. type	:	Screws
ii. size	:	10 x 30mm
iii. quantity	:	10No.
Fixing hinge to frame		
i. type	:	Screws
ii. size	:	10 x 30mm
iii. quantity	:	10No.

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Item		Description
16. Lock		
Supplier/manufacturer	:	Winkhaus
Description	:	AV2-F 3-point lock
Reference	:	2559895
Face plate size	:	20 x 1770 x 3mm
Intumescent protection (if applicable)	:	ST30 Graphite Lock Kit
Position	:	1070mm to centre of spindle/lock
Fixings		
i. type	:	Woodscrews
ii. size	:	12No.
iii. quantity	:	7 x 38mm
17. Lock Keeps		
Supplier/manufacturer	:	Winkhaus
Description	:	Keeps
Reference		
i. top & bottom keeps	:	F24-908 – single pocket keep
ii. centre keep	:	F24-908 Centre-keep
Material	:	
Intumescent protection (if applicable)	:	STS Graphite FS567 AV2 Kit
Overall size		
i. top & bottom keeps	:	24 x 235 2.5mm
Fixing keeps to frame		
i. type	:	Woodscrews
ii. size	:	2 x 25mm
iii. quantity	:	7No.
18. Cylinder		
Supplier/manufacturer	:	Euro Profile
Description	:	Euro Cylinder
TS007 certification ref (if applicable)	:	KM 561977
Reference	:	KIN 30/30 NAS
Overall size	:	72mm
Fixings		
i. type	:	Screw
ii. size	:	M5 x 55mm
iii. quantity	:	1No.
19. Lever handles		
Supplier/manufacturer	:	Era Fab & Fix
Description	:	Windsor Lever Handle
Reference	:	1F302
TS007 certification ref (if applicable)	:	
Material	:	Solid die cast zinc
Overall size	:	243 x 32mm
Lever length	:	17 x 120mm
Fixings		
i. type	:	M5
ii. size	:	55mm
iii. quantity	:	2No.

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Item		Description
20. Door closer		
Supplier/manufacturer	:	Eclipse
Description	:	Face fixed door closer
Reference	:	28730
Fixing device to doorleaf		
i. type	:	Screws
ii. size	:	M5 x 30mm
iii. quantity	:	4No.
Fixing device to frame		
i. type	:	Screws
ii. size	:	M5 x 28mm
iii. quantity	:	2No.

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PERFORMANCE CRITERIA & TEST RESULTS

Clause 4 Exposure category and classification

Exposure Category Required:	800
Atmospheric Conditions	
Air Temp	24.6°C
Humidity	47.9%RH
Air Pressure	99.8kPa
Test Sample	
Overall Size of Sample	1000 x 2205mm
Overall Area	2.21m2
Joint length leaf/casement	928 x 2155mm
Opening Joint Length (m)	6.17m

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	12.87	2.21	7.54
100 Pa	20.93	3.18	12.06
150 Pa	27.62	4.05	15.84
200 Pa	34.29	4.77	19.53
250 Pa	41.28	5.32	23.30
300 Pa (if required)	48.13	5.66	26.90

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	35.99	6.18	21.09
100 Pa	58.53	8.89	33.71
150 Pa	77.25	11.33	44.29
200 Pa	95.88	13.33	54.61
250 Pa	115.44	14.86	65.15
300 Pa (if required)	134.60	15.84	75.22

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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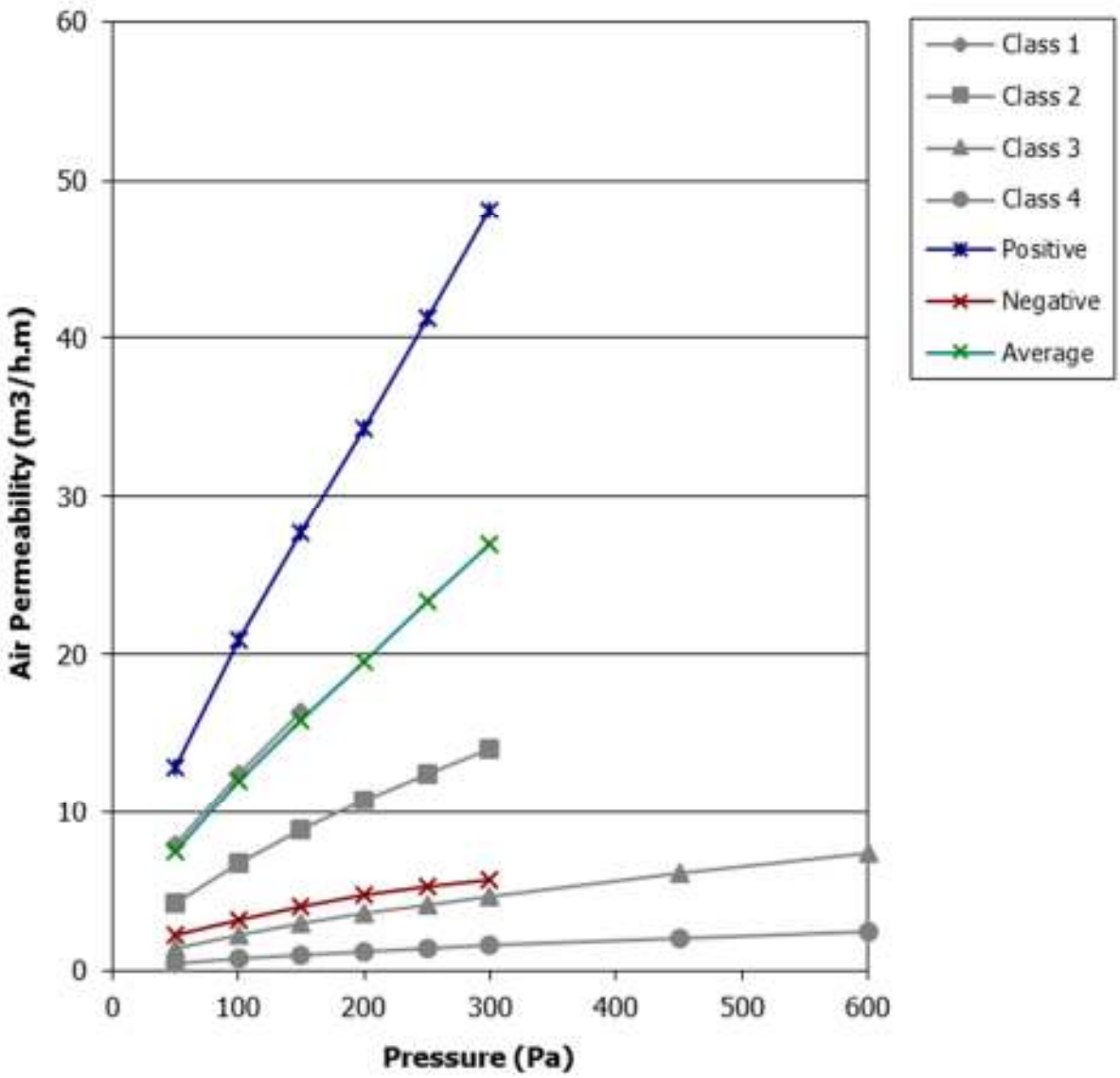
Graph of air permeability per unit length



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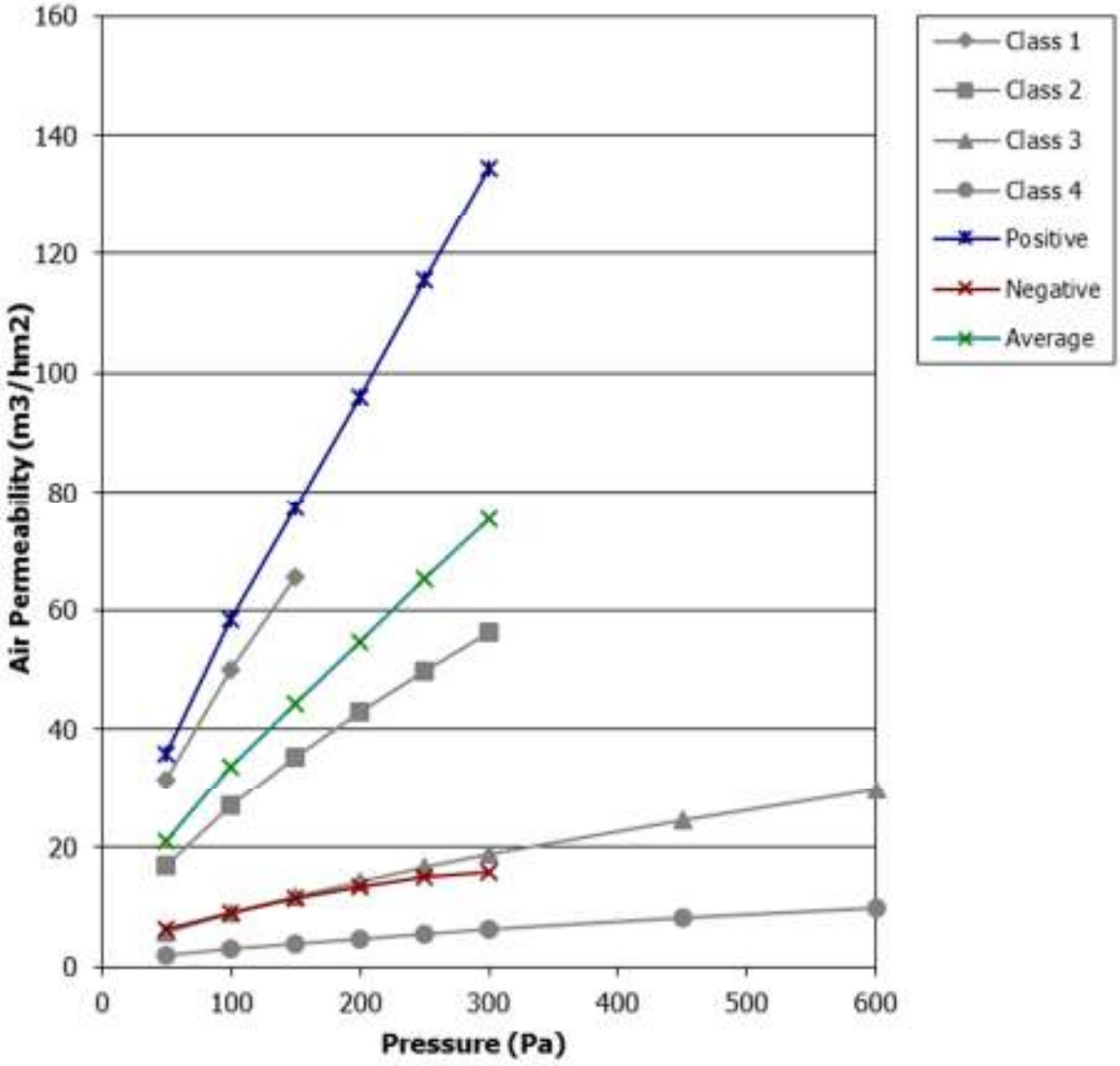
Graph of air permeability per unit area



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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	1A
Distance of nozzles from sample (250mm +10 –0mm)	250mm
Angle of nozzles (24° +2° - 0°)	24.2°
Height of nozzle above joint (0 – 150mm)	90mm

Pressure (Pa)	Duration (mm:ss)	Observations	
0 Pa	16 seconds	Leakage observed in bottom of both corners.	FAILED CLASS 1A

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Clause 7 Watertightness test observations

Continuous and repeated water penetration in both corners after 16 seconds at 0Pa

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Clause 8 Wind Resistance

Members chosen for deflection measurement

Positive wind pressure

Member tested	Pressure applied	Measured Length	Deflection	Fraction
Lockside Edge	807 Pa	2130 mm	0.05 mm	1/42600

Negative wind pressure

Member tested	Pressure applied	Measured Length	Deflection	Fraction
Lockside Edge	-802 Pa	2130 mm	0.4 mm	1/5325

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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	12.81	2.02	7.41
100 Pa	20.19	3.09	11.64
150 Pa	26.80	3.97	15.38
200 Pa	33.21	4.56	18.89
250 Pa	39.70	5.13	22.42
300 Pa (if required)	46.21	5.48	25.84

Test Pressure	Calculated Air Permeability per unit area		
	Positive m^3 / h.m^2	Negative m^3 / h.m^2	Average m^3 / h.m
50 Pa	35.81	5.64	20.73
100 Pa	56.47	8.64	32.55
150 Pa	74.93	11.10	43.02
200 Pa	92.87	12.76	52.81
250 Pa	111.00	14.36	62.68
300 Pa (if required)	129.21	15.32	72.27

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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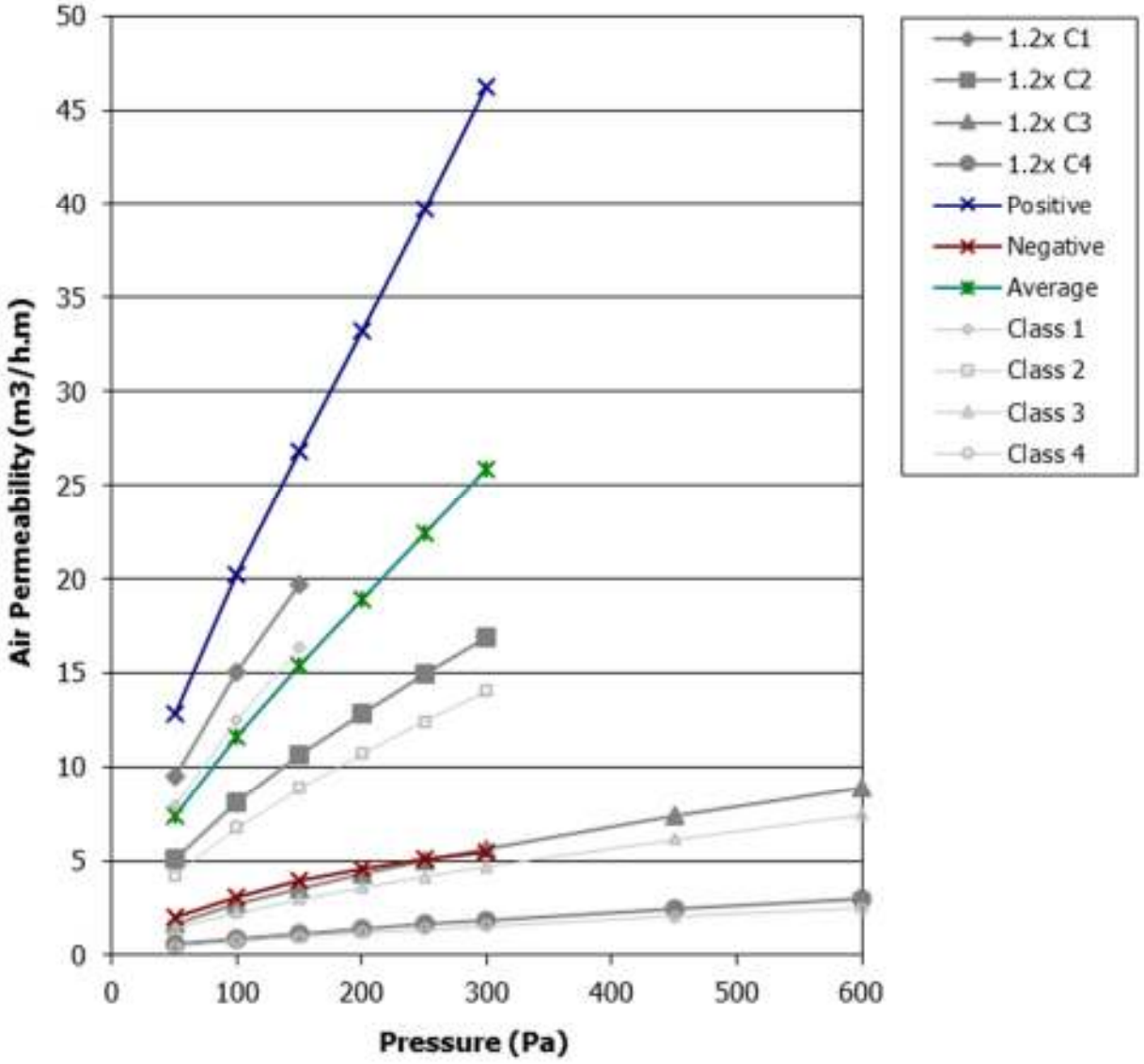
Graph of air permeability per unit length following wind resistance test



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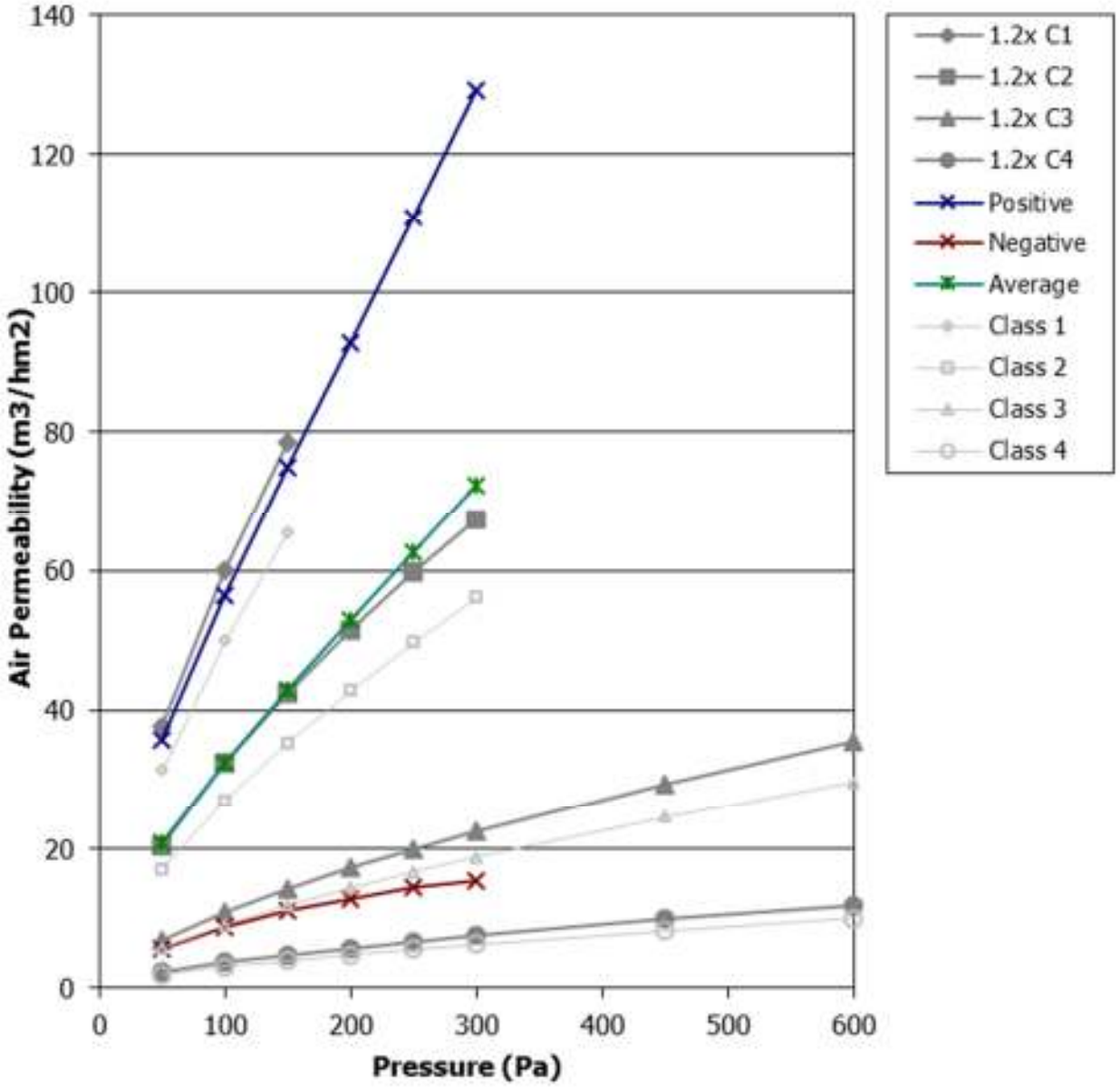
Graph of air permeability per unit area following wind resistance test



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 800. The client's initial requirement was for Class 4. 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 1, and per unit area met the requirements of Class 1. During the repeat air permeability test the average air leakage continued to meet the requirements of Class 1. **The sample could therefore be classified as Class 1 for the air permeability test.**	**PASS CLASS 1**
7 Test for water tightness	BS6375-1 requires a performance of Class 3A, defined in BS EN 12208 for UK exposure category 800. 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 0min and 16sec into a test pressure of 0 Pa when water penetration was observed Bottom of both corners . **The sample could therefore be classified as Class 0 for the watertightness test.**	**PASS CLASS 0**
8 Test for resistance to wind - Deformation test	BS6375-1 requires a performance of Class A2, defined in BS EN 12210, for UK exposure category 800. The client's initial requirement was for Class A2. The sample was tested in accordance with BS EN 12211 in the locked condition as requested by the client. For Class A2 the test pressure P1 to be applied is 800Pa, 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 Lockside Edge, it was 2130mm long, and was subject to a maximum deflection of 0.05mm (1/42600) for positive wind pressure. For negative pressure the member tested was the Lockside Edge, it was 2130mm long, and was subject to a maximum deflection of	**PASS**

Clause	Result	Pass/Fail
	0.4mm (1/5325) for negative wind pressure. The sample met the requirements for Class C2 for the deflection test.	
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 -400Pa and 400Pa repeated 50 times there were no visible failures. The air permeability of the sample continued to meet the requirements of Class 1, and the sample met the requirements of Class C2 for the repeated pressure test.	**PASS**
Safety test	During the safety test under a pressure P3 of -1200Pa & 1200Pa 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 C2 for the safety test. **The sample could therefore be classified as Class C2 for the wind resistance test.**	**PASS CLASS C2**

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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 1 for air permeability, Class 0 for water tightness, and Class C2 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:	

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

END OF REPORT