

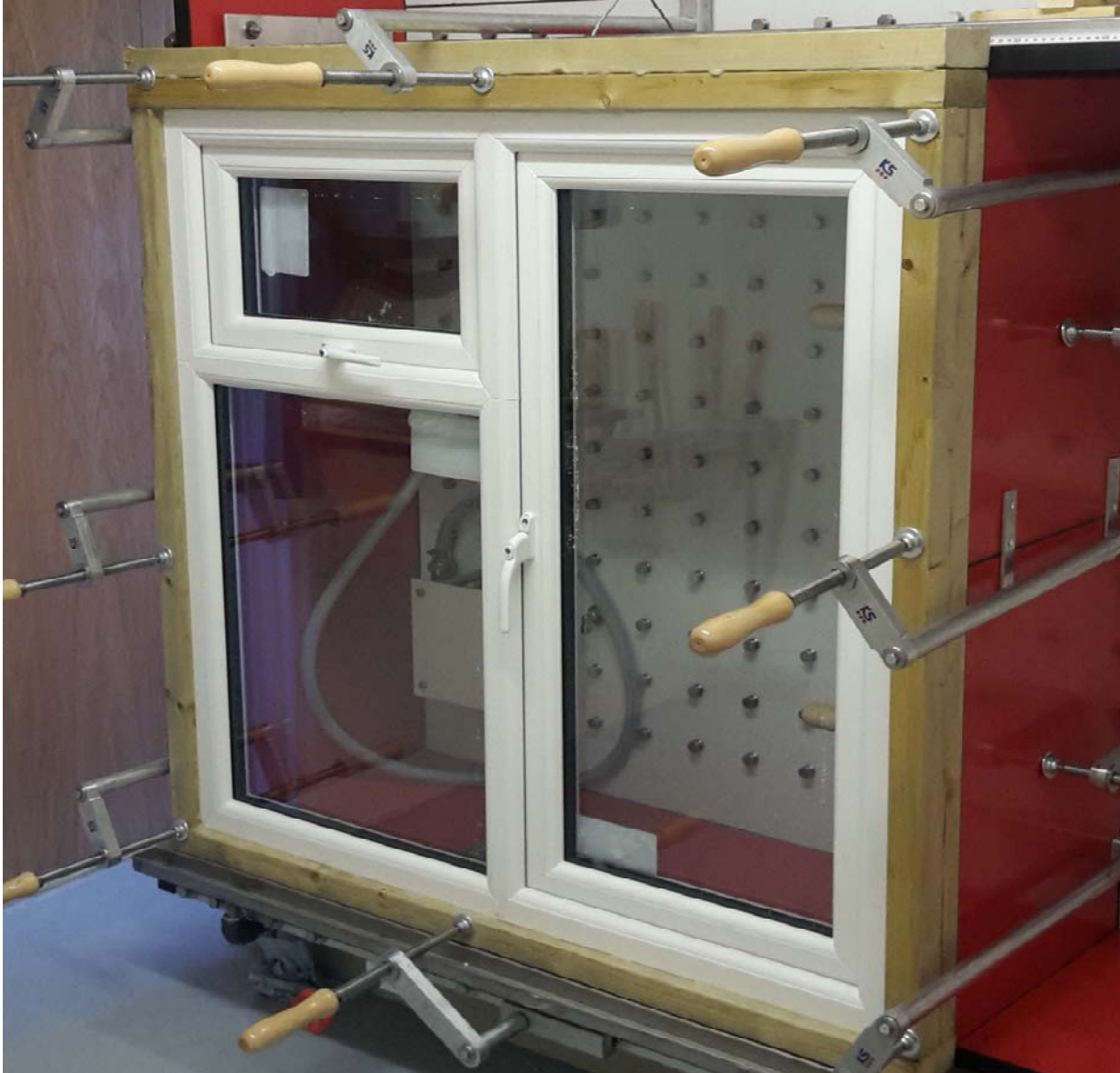


Test Report No: WTH 1614-2  
Date: 12/12/2016  
Testing of: Side hung next to top hung over fixed light projecting casement window  
Tested to: Weathertightness test BS 6375: Part 1  
Prepared for: Nico Manufacturing Ltd

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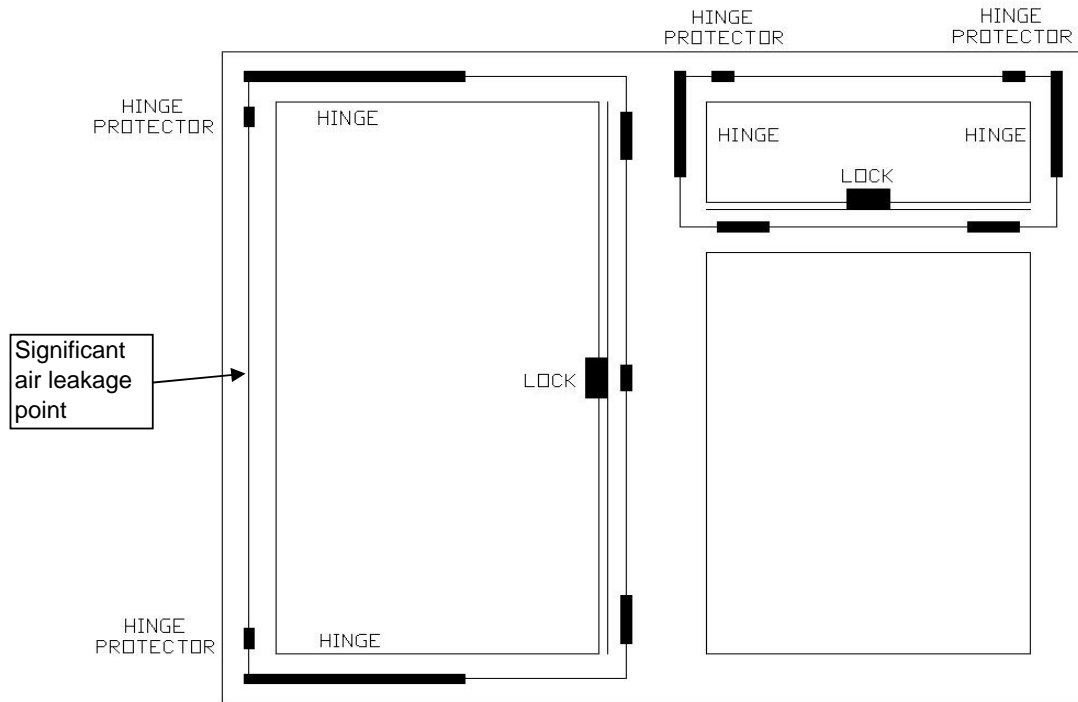


**PICTURE OF TEST WINDOW**

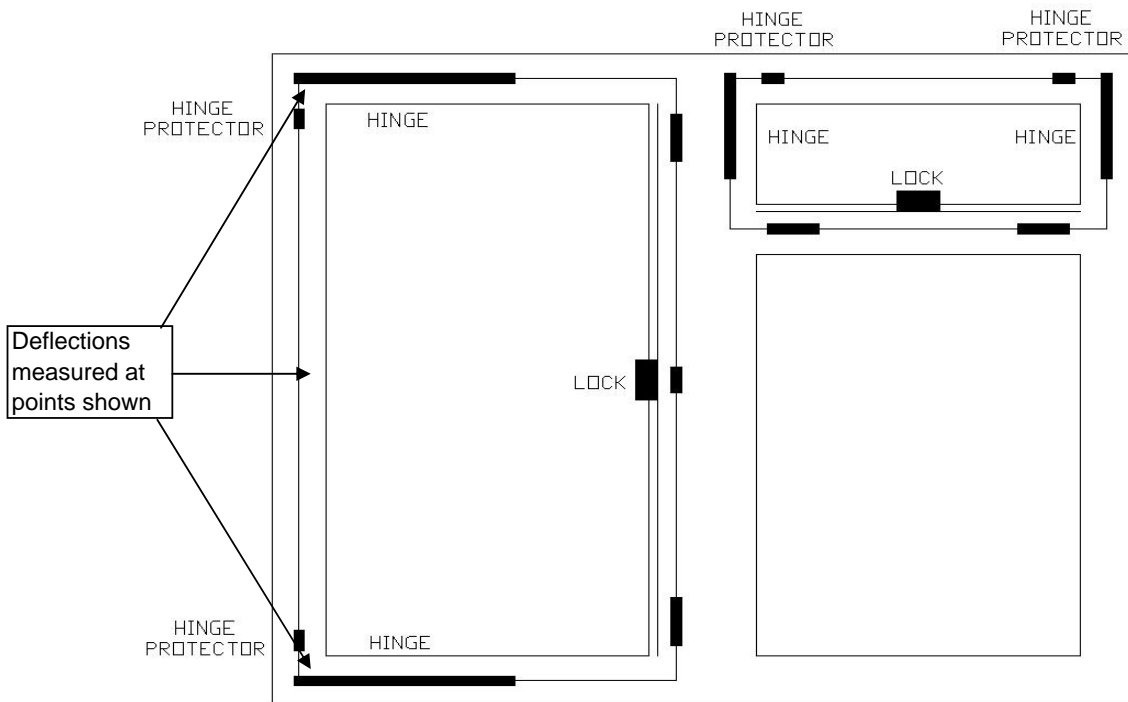




**Positions of water leakage and significant air leakage**



**Position of deflection measurement**



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**AUTHORISATION**

Test completed by: D.Kury  
 Assisted by: N/A  
 Test witnessed by: N/A

Report produced by: D.Kury  
 Signature:   
 Date: 06/01/2017

For and on behalf of Nico Manufacturing Ltd Test Laboratory

Report authorised by: M.Franklin  
 Signature:   
 Date: 09/01/2017

For and on behalf of Nico Manufacturing Ltd Test Laboratory

Date of issue of report 09/01/2017

**Nico Manufacturing Ltd. Test Laboratory**

Oxford Road

Clacton-on-Sea

ESSEX

CO15 3TJ

Telephone +44 (0) 1255 422333

Fax +44 (0) 1255 432909

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**TEST REQUESTED BY**

**Origin of test request**

Company Name	Nico Manufacturing Ltd
Company Address	109 Oxford Road Clacton on Sea Essex CO15 3TJ
Contact	Mr Ian Harrison
Contact position	Sales Director

**Quotation Details**

Quotation No.
Dated:

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**DETAILS OF TEST**

Description	Side hung next to top hung over fixed light
Model / type	Projecting casement window
Make / Brand	Veka 70
Date sample received	17/11/2016
Any special requirements	

**Air permeability tests in accordance with BS EN 1026: 2016** - A series of positive and negative pressures was applied to the test sample and the air leakage through the sample was measured at each pressure step. Pressure steps applied are defined on the air permeability test sheets in this report.

**Waterightness test in accordance with BS EN 1027: 2016** - A specified volume of water was constantly sprayed over the external face of the test sample while a positive pressure was applied, the positive pressure was increased at regular intervals. The test pressure, time and location of any water penetration was recorded. Pressure steps applied are defined on the watertightness test sheet in this report.

**Resistance to wind load test in accordance with BS EN 12211: 2016** - Positive and negative pressures P1, were applied to the test sample and the deflection under load was measured, a series of 50 cycles of positive and negative pressure P2 were applied and any damage caused was noted and a safety test consisting of a single cycle of positive and negative pressures P3 was applied and any damage caused was noted  
P2 = 0.5P1, P3 =1.5P1.  
Values of these loads are defined on the Resistance to wind load test sheet in this report.

Note : The test specimens were kept in the test laboratory for at least 12 hours at environmental conditions of between 10°C to 30°C, and 25% RH to 75% RH before each test was undertaken

The sample was mounted in a timber sub frame (nominal 100mm x 50mm in section) and sealed to the sub frame. The sample was mounted in the test rig without any twists or bends that might influence the test result.

**DETAILS OF SAMPLE**

Sample details	Side hung next to top hung over fixed light projecting casement window
Fabricator	Consort Ltd
Material:	PVC-U, fully welded joints Frame - Veka profile part no 101160 Sash - Veka profile part no 103264 Mullion & transom - Veka profile part no 102261 Reinforcing;
Finish	White
Lock & keeps	Locks - side hung sash - Nico telescopic shootbolt , part no 979111422 top hung sash - Nico telescopic shootbolt, part no 9795622 Keeps - Cast zinc, part nos ; Espag keeps 9003, corner keeps 93K1
Hinges & protectors	Hinges; Side hung sash - Nico 16" standard 13mm friction hinge, part no 7740 Top hung sash - Nico 8" standard 13mm friction hinge, part no 7710
Handle	ERA Maxim 3, r/h cranked to side hung and top hung sashes.
Fixings	Lock; 3.9 x 30mm c'sk head pierce point Keeps; 4.3 x 25mm c'sk head pierce point to front position, 3.9 x 25mm c'sk drill point to rear position. Hinges; 4.3 x 25mm pan head pierce point to sash and frame.
Weather sealing	Co-extruded EPDM gasket
Glass (or infill)	28mm double glazed sealed unit, 4-20-4mm Toughened glass.
Glazing system	Internally bead glazed Beads have co-extruded EPDM gaskets
Sample dimensions	1200mm (h) x 1200mm (w) overall, central mullion, transom 400mm down.
Additional information	





**CONCLUSIONS OF TEST**

Standard	Test Description	Test result
BS EN 1026: 2016	Air permeability of test chamber	Pass
BS EN 1026: 2016	Air permeability of test sample (first test)	Pass
BS EN 1027: 2016	Watertightness test	Pass
BS EN 12211: 2016	7.2 Deflection test	Pass
BS EN 12211: 2016	7.3 Repeated pressure test	Pass
BS EN 1026: 2016	Air permeability of test sample (second test)	Pass
BS EN 12211: 2016	Safety test	Pass

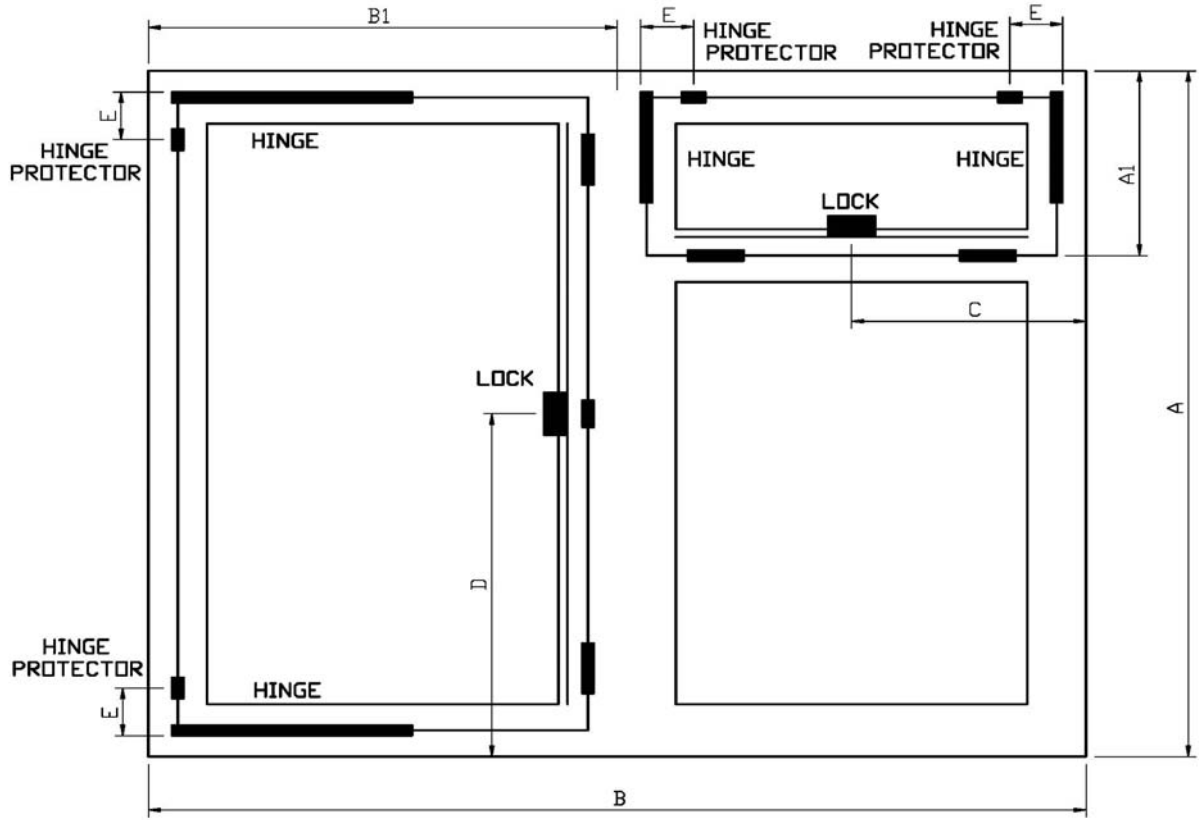
Exposure category classification in accordance with BS 6375-1 2015 (clauses 6, 7 & 8)

**Classification achieved:**

UK exposure category	Air permeability		Watertightness		Resistance to wind load			
	Class	Maximum test pressure	Class	Maximum test pressure	Class	P1	P2	P3
1600	2	600Pa	5A	300 Pa	A4	1600Pa	800Pa	2400Pa



**TEST WINDOW DRAWING**



- A = 1200 mm
- A1 = 400 mm
- B = 1200 mm
- B1 = 600 mm
- C = 300 mm
- D = 600 mm
- E = N/A mm

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**AIR PERMEABILITY: BS EN 1206: 2016**

The window was tested with the opening sashes in the closed and locked position

Window opened and closed before applying pressure pulses	Yes
Three positive pressure pulses applied	Yes

Table 1 - Air permeability with positive pressure (adjusted for laboratory conditions)

Pressure differential Pa	Air flow through test sample m³/h	Air flow per unit area of test sample m³/h/m²	Air flow per metre of opening joints m³/h/m
50	3.15	2.19	0.60
100	5.48	3.80	1.03
150	6.68	4.64	1.26
200	8.09	5.62	1.53
250	8.31	5.77	1.57
300	11.54	8.02	2.18
450	13.94	9.68	2.63
600	17.05	11.84	3.22

Window opened and closed before applying pressure pulses	Yes
Three negative pressure pulses applied	Yes

Table 2 - Air permeability with negative pressure (adjusted for laboratory conditions)

Pressure differential Pa	Air flow through test sample m³/h	Air flow per unit area of test sample m³/h/m²	Air flow per metre of opening joints m³/h/m
50	4.68	3.25	0.89
100	6.24	4.33	1.18
150	8.05	5.59	1.52
200	10.97	7.62	2.07
250	13.76	9.55	2.60
300	17.37	12.06	3.28
450	25.76	17.89	4.87
600	38.95	27.05	7.36

5.3

Table 3 - Air permeability averages with positive and negative pressures

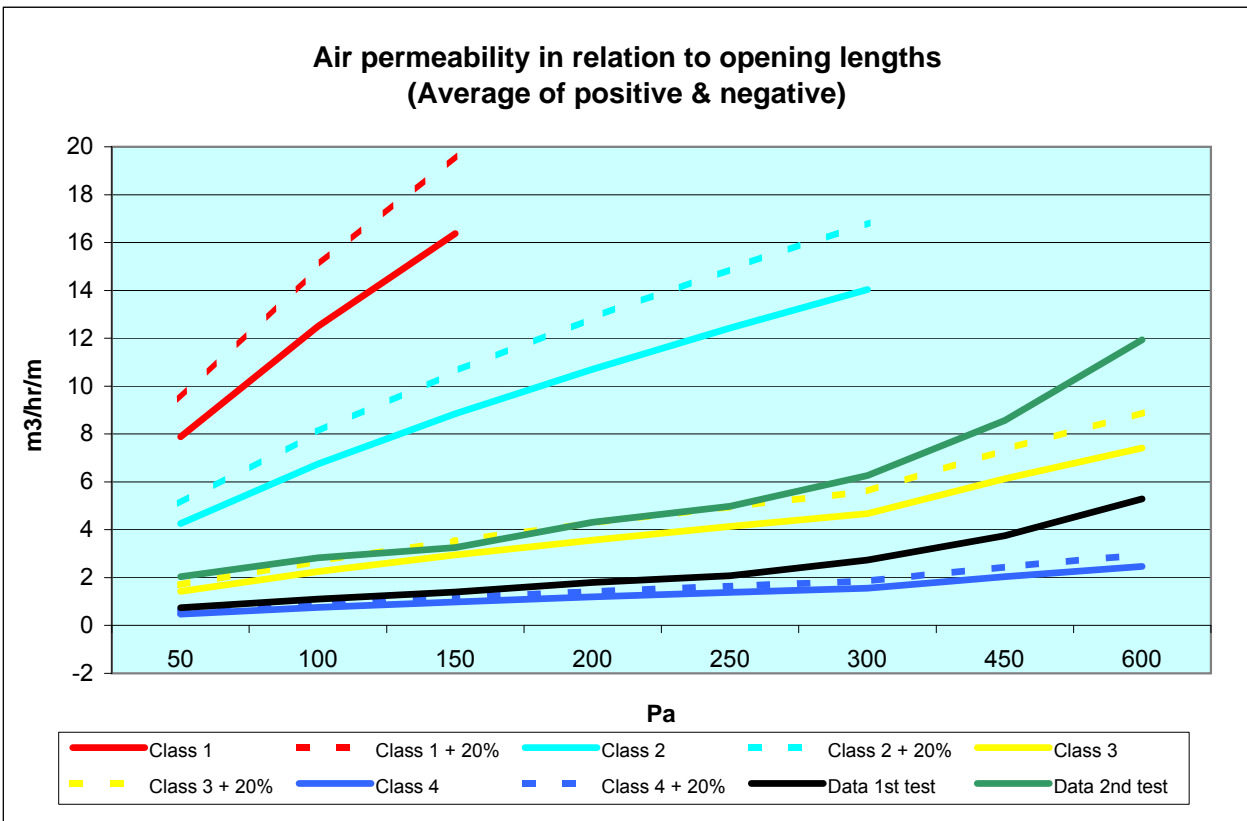
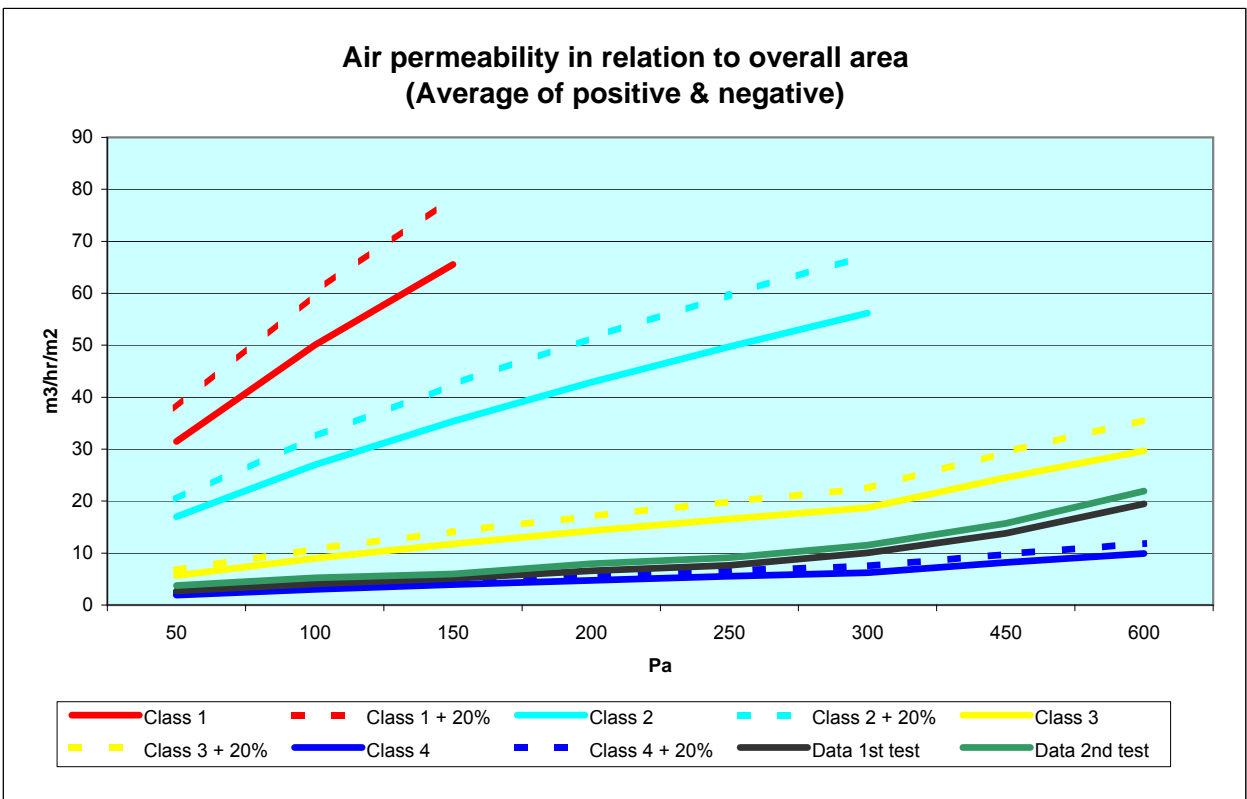
Pressure differential Pa	Air flow per average unit area of test sample m³/h/m²	Air flow average per metre of opening joints m³/h/m
50	2.72	0.74
100	4.07	1.11
150	5.11	1.39
200	6.62	1.80
250	7.66	2.09
300	10.04	2.73
450	13.78	3.75
600	19.44	5.29

Total surface area of test sample (m²)
1.44

Total length of opening joints (m)
5.292



**AIR PERMEABILITY GRAPHS**



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**WATERTIGHTNESS: BS EN 1027: 2016**

The window was tested with the opening sashes in the closed and locked position

**Watertightness data (Test method 1A)**

Maximum test pressure	300Pa
Pressure pulses	500Pa

(Pressure pulses should be maximum test pressure + 10% or 500Pa whichever is the greater)

Window opened and closed before applying pressure pulses	Yes
Three positive pressure pulses applied	Yes

Air pressure (Pa)	Spray duration (minutes)	Water Leaks	Position of leak (See also leakage diagram)	Time of leak min:sec
0	15 +1/-0	None		
50 +/-5%	5 +1/-0	None		
100 +/-5%	5 +1/-0	None		
150 +/-5%	5 +1/-0	None		
200 +/-5%	5 +1/-0	None		
250 +/-5%	5 +1/-0	None		
300 +/-5%	5 +1/-0	None		
450 +/-5%	5 +1/-0			
600 +/-5%	5 +1/-0			

**Laboratory Conditions**

Air pressure (mbar)	1023
Laboratory air temp. (°C)	18.2
Relative humidity (%)	44

Number of spray nozzles	3
Total flow rate	6

**Classification**

Test pressure (Pa)	Classification		Spec.
	Test method A	Test method B	
0	1A	1B	15 min
50	2A	2B	C1+5 min
100	3A	3B	C2+5 min
150	4A	4B	C3+5 min
200	5A	5B	C4+5 min
250	6A	6B	C5+5 min
300	7A	7B	C6+5 min
450	8A	8B	C7+5 min
600	9A	9B	C8+5 min



**RESISTANCE TO WIND LOAD: BS EN 12211: 2016**

**Deflection test: Positive pressure** P1= 1600 Pa

Section being measured: Hinge side of side hung sash	Deflection gauge readings (mm)				Length	Relative deflection
	Top end	Centre	Bottom End	Net deflection		
3 pulses of 1760						
Pre-test reading	0	0	0	0.17	1200	1/ 7060
Max reading	0.31	0.43	0.21			
Net deflection under load	0.31	0.43	0.21			
Residual reading	0	0	0			

**Deflection test: Negative pressure** P1= 1600 Pa

Section being measured: Hinge side of side hung sash	Deflection gauge readings (mm)				Length	Relative deflection
	Top end	Centre	Bottom End	Net deflection		
3 pulses of 1760						
Pre-test reading	0	0	0	1.185	1200	1/ 1010
Max reading	0.42	1.56	0.33			
Net deflection under load	0.42	1.56	0.33			
Residual reading	0.15	0.76	0.09			

**Test conclusion:** Worst case deflection 1/ 7060 Classification A4

**Cyclic repeated pressure test** P2= 800 Pa

50 cycles +/- at 800 Pa	No damage	Pass
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**Safety test** P3= 2400 Pa

1 cycle +/- at 2400 Pa	Window remained closed and intact	Pass
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**Laboratory Conditions**

Air pressure	1023	mbar
Air temperature	18.2	°C

Relative humidity	44	%
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**Classifications**

Wind load			
Class	P1	P2	P3
0	Not tested		
1	400	200	600
2	800	400	1200
3	1200	600	1800
4	1600	800	2400
5	2000	1000	3000

Deflection	
Class	Relative frontal deflection
A	≤ 1/150
B	≤ 1/200
C	≤ 1/300

Resistance to wind load			
Wind load class	Relative frontal deflection		
	A	B	C
1	A1	B1	C1
2	A2	B2	C2
3	A3	B3	C3
4	A4	B4	C4
5	A5	B5	C5

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**AIR PERMEABILITY: BS EN 1206: 2016**

The window was tested with the opening sashes in the closed and locked position

Window opened and closed before applying pressure pulses	Yes
Three positive pressure pulses applied	Yes

Table 1 - Air permeability with positive pressure (adjusted for laboratory conditions)

Pressure differential Pa	Air flow through test sample m <sup>3</sup> /h	Air flow per unit area of test sample m <sup>3</sup> /h/m <sup>2</sup>	Air flow per metre of opening joints m <sup>3</sup> /h/m
50	4.28	2.97	1.62
100	6.69	4.64	2.53
150	6.90	4.79	2.61
200	9.43	6.55	3.56
250	9.64	6.70	3.64
300	13.00	9.03	4.91
450	15.60	10.83	5.89
600	18.73	13.00	7.08

Window opened and closed before applying pressure pulses	Yes
Three negative pressure pulses applied	Yes

Table 2 - Air permeability with negative pressure (adjusted for laboratory conditions)

Pressure differential Pa	Air flow through test sample m <sup>3</sup> /h	Air flow per unit area of test sample m <sup>3</sup> /h/m <sup>2</sup>	Air flow per metre of opening joints m <sup>3</sup> /h/m
50	6.54	4.54	2.47
100	8.31	5.77	3.14
150	10.33	7.18	3.91
200	13.38	9.29	5.06
250	16.68	11.59	6.31
300	20.13	13.98	7.61
450	29.73	20.65	11.24
600	44.43	30.86	16.79

Table 3 - Air permeability averages with positive and negative pressures

Pressure differential Pa	Air flow per average unit area of test sample m <sup>3</sup> /h/m <sup>2</sup>	Air flow average per metre of opening joints m <sup>3</sup> /h/m
50	3.76	2.04
100	5.21	2.83
150	5.98	3.26
200	7.92	4.31
250	9.14	4.97
300	11.50	6.26
450	15.74	8.57
600	21.93	11.94

Total surface area of test sample (m <sup>2</sup> )
1.44

Total length of opening joints (m)
2.646