



Test Report No: WTH2404#1-2

Date: 29/04/2024

Testing of: Side hung next to side hung flying mullion casement window

Tested to: BS 6375-1:2015+A1:2016

Prepared for: Nico Manufacturing Ltd

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Test Report No. WTH2404#1-2	Page 2 of 15
Testing of	Side hung next to side hung flying mullion casement window
Testing to	BS 6375-1:2015+A1:2016



CONTENTS

	Page No.
Authorisation	3
Test requested by	4
Details of test	5
Details of samples	6
Conclusion of tests	7
Test window drawing	8
Air permeability tables (first test)	9
Air permeability graphs (both tests)	10
Watertightness	11
Resistance to wind load	12
Air permeability tables (second test)	13
Deflection & leakage diagrams	14
Picture of test window	15

Test Report No. WTH2404#1-2	Page 4 of 15
Testing of	Side hung next to side hung flying mullion casement window
Testing to	BS 6375-1:2015+A1:2016



TEST REQUESTED BY

Origin of test request

Company Name	Nico Manufacturing Ltd
Company Address	Oxford Road Clacton on Sea Essex CO15 3TJ
Contact	Ian Harrison
Contact position	Sales & Marketing director

Quotation Details

Quotation No.	WTH2404
Dated:	23/01/2024

Test Report No. WTH2404#1-2	Page 5 of 15
Testing of	Side hung next to side hung flying mullion casement window
Testing to	BS 6375-1:2015+A1:2016



DETAILS OF TEST

Description	Projecting casement window
Model / type	Side hung next to side hung
Make / Brand	Eurocel logic
Any special requirements	

Test Specification	BS 6375-1:2015+A1:2016 Performance of windows & doors. Classification for weathertightness and guidance on selection and specification
Date sample received	07/03/2024
Date testing started	29/04/2024
Date testing finished	29/04/2024
Job No.	WTH2404
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.

Test specimen details

Details of the samples construction and hardware components is based on information supplied by the test client, while these details have been checked and verified where possible WTH accepts no responsibility for the accuracy of details supplied. The samples tested were as selected and supplied by the customer with no input from WTH.

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.

Test Report No. WTH2404#1-2	Page 6 of 15
Testing of Side hung next to side hung flying mullion casement window	
Testing to BS 6375-1:2015+A1:2016	



DETAILS OF SAMPLE

Sample number	WTH2404E
Sample details	Side hung next to side hung flying mullion casement window
Fabricator	Quantum Windows Ltd
Material:	PVC-U, Eurocell logic profile Eurocell part numbers; Frame - EWS7011W, Sash - EWS7008W, False Mullion - EWS7002W, Transom/Mullion Reinforcement - 801P, False Mullion End Cap - EWS7205W
Finish	Gloss White
Lock & keeps	Lock - Nico Shootbolt system comprising MK2 gearbox part no 93905 on both master and slave sash with shootbolt extension 4 part no 93945 on slave sash and Master shootbolt extension part no 93945M on Master leaf. Keeps - Nico cast zinc espag keep part no 9005 and Nico cast zinc shootbolt keep part no 9505L & R.
Hinges & protectors	Hinges - Nico 17mm stack Atlas Quad, part no 8471L/R on bottom and Nico 17mm stack 14" Atlas on top, part no 8571L/R Hinge protectors - Nico Xtra bolt, part no 8100
Handle	Fab & Fix inline white
Fixings	Lock - 4.3 x 30mm c'sk head pierce point Keeps - 4.3 x 30mm c'sk head pierce point Hinges - 4.3 x 30mm c'sk head pierce point to sash, 4.2 x 21mm pan head pierce point to frame Hinge protectors - 4.3 x 30mm c'sk head pierce point Weather interlock wedges - 4.3 x 25mm c'sk head pierce point
Weather sealing	Co extruded gaskets Interlocking wedges, part no EWS7201
Glass (or infill)	4-20-4mm clear toughened double glazed units
Glazing system	Co extruded gaskets Internally bead glazed, part no EWS7301W
Sample dimensions	1470mm (h) x 1400mm (w), central mullion
Additional information	Clip in leading ramp, part no EWS7202W Face drain caps, part no FDC01



CONCLUSIONS OF TEST

Standard	Test Description	Test result
BS EN 1026: 2016	Air permeability of test sample (first test)	Class 4
BS EN 1027: 2016	Watertightness test	Class 8A
BS EN 12211: 2016	7.2 Deflection test	Class B
BS EN 12211: 2016	7.3 Repeated pressure test	Pass
BS EN 1026: 2016	Air permeability of test sample (second test)	Class 4
BS EN 12211: 2016	Safety test	Pass

WTH are accredited to BS 6375-1:2015 Performance of windows and doors, part 1 Classification for weathertightness and guidance on selection and specification.

This standard refers to a dated version of BS EN 1027:2000, however WTH are accredited to the dated version BS EN 1027:2016

The purpose of the revision of this european standard is to clarify the test method, the changes relate to definitions and descriptions, they do not affect the methodology of the test or the results obtained.

Due to the minimal leakage from the test sample it was not possible to comply with BS EN 1026:2016 section 7.2.3 which states that "In no case shall the air permeability of the test chamber exceed 30% of the overall air permeability of the test specimen and the test chamber"

Exposure category classification in accordance with BS 6375-1:2015+a1:2016 (clauses 6, 7 & 8)

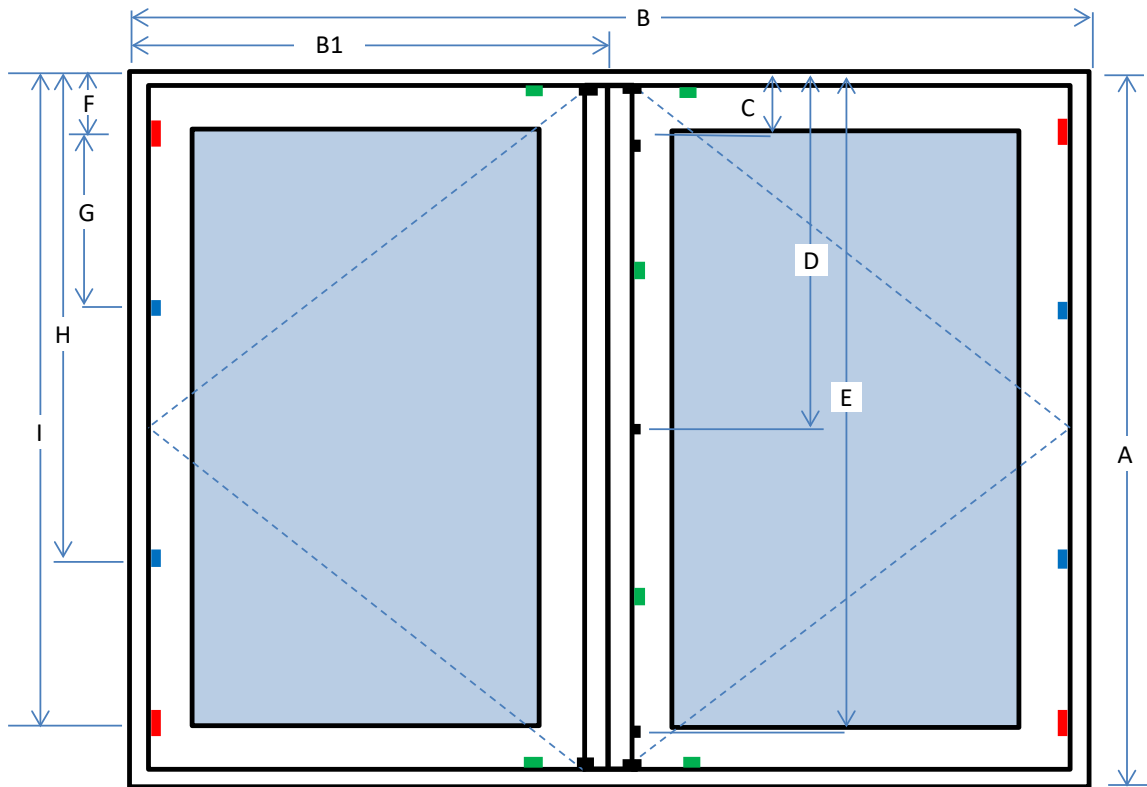
Classification achieved:

UK exposure category	Air permeability		Watertightness		Resistance to wind load			
	Class	Maximum test pressure (Pa)	Class	Maximum test pressure	Class	P1	P2	P3
1200	4	600	8A	450	B3	1200	600	1800

The results contained in this test report relate only to the particular sample/s tested as received and to the specific tests carried out as detailed within this report.



TEST WINDOW DRAWING



- █ Hinge protectors
- █ Riser block
- █ Pull in wedge
- █ Lock point

- A = 1470 mm
- B = 1400 mm
- B1 = 700 mm
- C = 95 mm
- D = 735 mm
- E = 1360 mm
- F = 95 mm
- G = 345 mm
- H = 1030 mm
- I = 1375 mm

Test Report No. WTH2404#1-2	Page 9 of 15
Testing of Side hung next to side hung flying mullion casement window	
Testing to BS 6375-1:2015+A1:2016	



AIR PERMEABILITY: BS EN 1206: 2016

Closing condition of window	Latched
Window surfaces cleaned and dry (WASHED AND DRIED)	Yes
Window opened and closed before applying pressure pulses	Yes
Three positive pressure pulses applied	Yes

Sample No	Temperature	Measured Humidity	Adjusted humidity	Date
WTH2404E	18.9 °C	51.4 %RH	50.6 %RH	29/04/2024

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

Pressure differential Pa	Air flow through test sample m ³ /h	Air flow per unit area of test sample m ³ /h/m ²	Air flow per metre of opening joints m ³ /h/m
50	0.95	0.46	0.14
100	1.23	0.60	0.18
150	1.57	0.76	0.23
200	1.81	0.88	0.26
250	2.11	1.02	0.31
300	2.26	1.10	0.33
450	2.72	1.32	0.39
600	3.02	1.47	0.44

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 ³ /h	Air flow per unit area of test sample m ³ /h/m ²	Air flow per metre of opening joints m ³ /h/m
50	0.76	0.37	0.11
100	1.21	0.59	0.18
150	1.53	0.75	0.22
200	1.81	0.88	0.26
250	1.95	0.95	0.28
300	2.17	1.05	0.31
450	2.63	1.28	0.38
600	3.04	1.48	0.44

Table 3 - Air permeability averages with positive and negative pressures

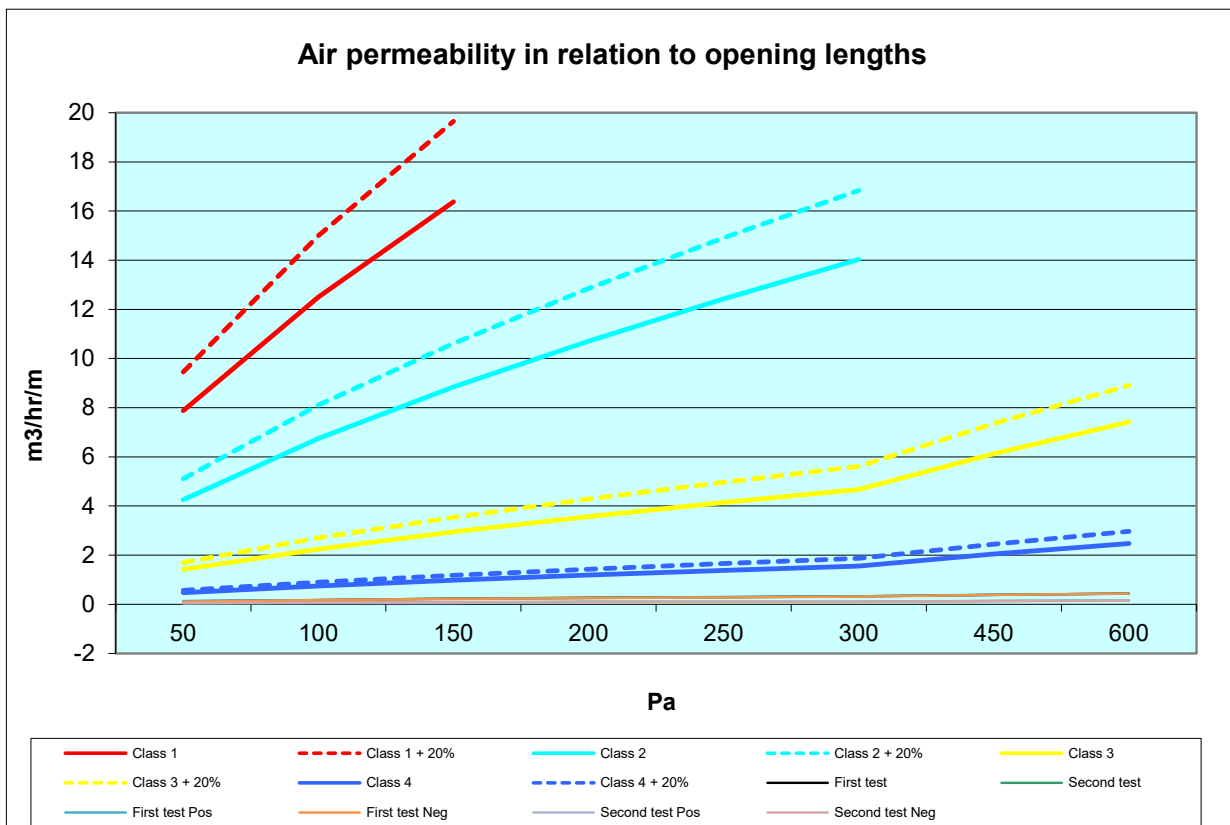
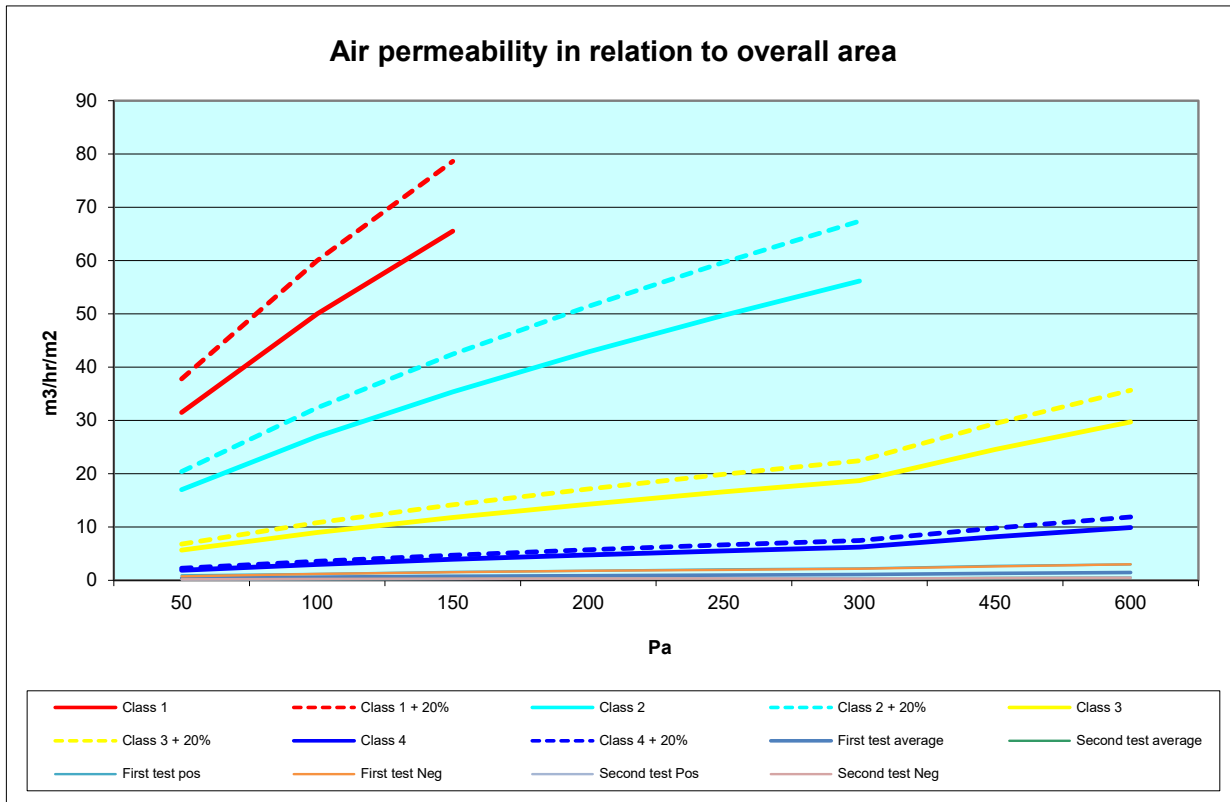
Pressure differential Pa	Air flow per average unit area of test sample m ³ /h/m ²	Air flow average per metre of opening joints m ³ /h/m
50	0.41	0.12
100	0.59	0.18
150	0.75	0.23
200	0.88	0.26
250	0.99	0.29
300	1.08	0.32
450	1.30	0.39
600	1.47	0.44

Total surface area of test sample (m ²)
2.06

Total length of opening joints (m)
6.904



AIR PERMEABILITY GRAPHS



Test Report No. WTH2404#1-2	Page 11 of 15
Testing of	Side hung next to side hung flying mullion casement window
Testing to	BS 6375-1:2015+A1:2016



Sample No	Temperature	Measured Humidity	Adjusted humidity	Date
WTH2404E	19.7 °C	49.4 %RH	48.5 %RH	29/04/2024

WATERTIGHTNESS: BS EN 1027: 2016 (Pressure pulses should be maximum test pressure + 10% or 500Pa whichever is the greater)

Watertightness data (Test method 1A)

Maximum test pressure	600
Pressure pulses	660

Water temperature

Pre test	16 °C	Post test	25 °C
Spray angle checked on each nozzle			Yes
Nozzle line height checked ≤150mm above joint			Yes

Closing condition of window	Latched
Window surfaces cleaned and dry (WASHED AND DRIED)	Yes
Window opened and closed before applying pressure pulses	Yes
Three positive pressure pulses applied	Yes

Required air pressure (Pa)	Recorded air pressure	Required Spray duration (mins)	Recorded spray duration	Water Leaks	Position of leak (See also leakage diagram)	Time of leak min:sec
0	0	15 +1/-0	15	None		
50 +/-5%	50	5 +1/-0	5	None		
100 +/-5%	100	5 +1/-0	5	None		
150 +/-5%	150	5 +1/-0	5	None		
200 +/-5%	200	5 +1/-0	5	None		
250 +/-5%	250	5 +1/-0	5	None		
300 +/-5%	300	5 +1/-0	5	None		
450 +/-5%	450	5 +1/-0	5	None		
600 +/-5%	600	5 +1/-0	0	Yes	Bottom right of right sash	0

Laboratory Conditions

Air pressure (mbar)	1018
Laboratory air temp. (°C)	19.7
Relative humidity (%)	48.5

Number of spray nozzles	4
Total flow rate (LPM)	8

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

Test Report No. WTH2404#1-2	Page 12 of 15
Testing of	Side hung next to side hung flying mullion casement window
Testing to	BS 6375-1:2015+A1:2016

Sample No	Temperature	Measured Humidity	Adjusted humidity	Date
WTH2404E	19.9 °C	53.1 %RH	52.5 %RH	29/04/2024

RESISTANCE TO WIND LOAD: BS EN 12211: 2016

Closing condition of window	Latched
Window surfaces cleaned and dry (WASHED AND DRIED)	Yes
Window opened and closed before applying pressure pulses	Yes
Three positive pressure pulses applied	Yes

Deflection test: Positive pressure P1= 1200 Pa

Section being measured: Mullion	Deflection gauge readings (mm)				Net deflection	Measured Length	Relative deflection
	1	2	3				
3 pulses of 1320							
Pre-test reading	20.0	20.0	20.0				
Max reading	22.8	27.6	22.2				
Net deflection under load	2.8	7.6	2.2	5.1		1330	1/ 261
Residual reading	20.0	20.1	20.0				

Deflection test: Negative pressure P1= 1200 Pa

Section being measured: Mullion	Deflection gauge readings (mm)				Net deflection	Measured Length	Relative deflection
	1	2	3				
3 pulses of 1320							
Pre-test reading	20.0	20.0	20.0				
Max reading	17.5	12.6	18.8				
Net deflection under load	-2.5	-7.4	-1.2	-5.6		1330	1/ -240
Residual reading	20.0	20.1	20.1				

Test conclusion:	Worst case deflection	1/ -240	Classification	B
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Cyclic repeated pressure test P2= 600 Pa

50 cycles +/- at 600 Pa	No damage or functioning defects	Pass
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Safety test P3= 1800 Pa

1 cycle +/- at 1800 Pa	Sample remained with no parts becoming detached	Pass
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Laboratory Conditions

Air pressure	1025.0	mbar
Air temperature	19.9	°C
Relative humidity	52.5	%

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

Test Report No. WTH2404#1-2	Page 13 of 15
Testing of Side hung next to side hung flying mullion casement window	
Testing to BS 6375-1:2015+A1:2016	



Sample No	Temperature	Measured Humidity	Adjusted humidity	Date
WTH2404E	19.7 °C	54.2 %RH	53.6 %RH	29/04/2024

AIR PERMEABILITY: BS EN 1206: 2016

Closing condition of window	Latched
Window surfaces cleaned and dry (WASHED AND DRIED)	Yes
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 ³ /h	Air flow per unit area of test sample m ³ /h/m ²	Air flow per metre of opening joints m ³ /h/m
50	0.26	0.13	0.04
100	0.36	0.18	0.05
150	0.43	0.21	0.06
200	0.68	0.33	0.10
250	0.76	0.37	0.11
300	0.77	0.37	0.11
450	0.95	0.46	0.14
600	1.13	0.55	0.16

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 ³ /h	Air flow per unit area of test sample m ³ /h/m ²	Air flow per metre of opening joints m ³ /h/m
50	0.40	0.19	0.06
100	0.59	0.29	0.09
150	0.69	0.33	0.10
200	0.65	0.31	0.09
250	0.67	0.32	0.10
300	0.61	0.30	0.09
450	0.88	0.43	0.13
600	1.00	0.49	0.15

Table 3 - Air permeability averages with positive and negative pressures

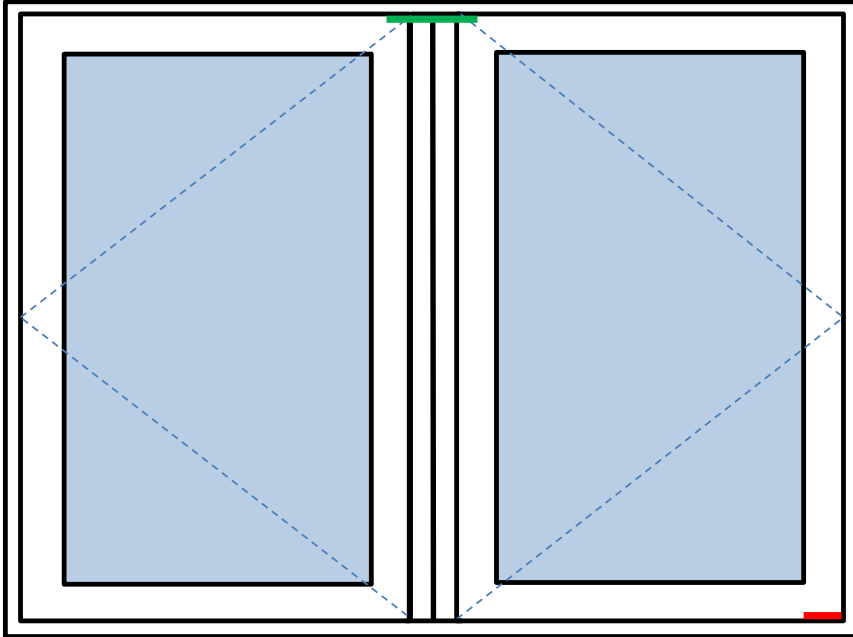
Pressure differential Pa	Air flow per average unit area of test sample m ³ /h/m ²	Air flow average per metre of opening joints m ³ /h/m
50	0.16	0.05
100	0.23	0.07
150	0.27	0.08
200	0.32	0.10
250	0.35	0.10
300	0.33	0.10
450	0.45	0.13
600	0.52	0.15

Total surface area of test sample (m ²)
2.06

Total length of opening joints (m)
6.904

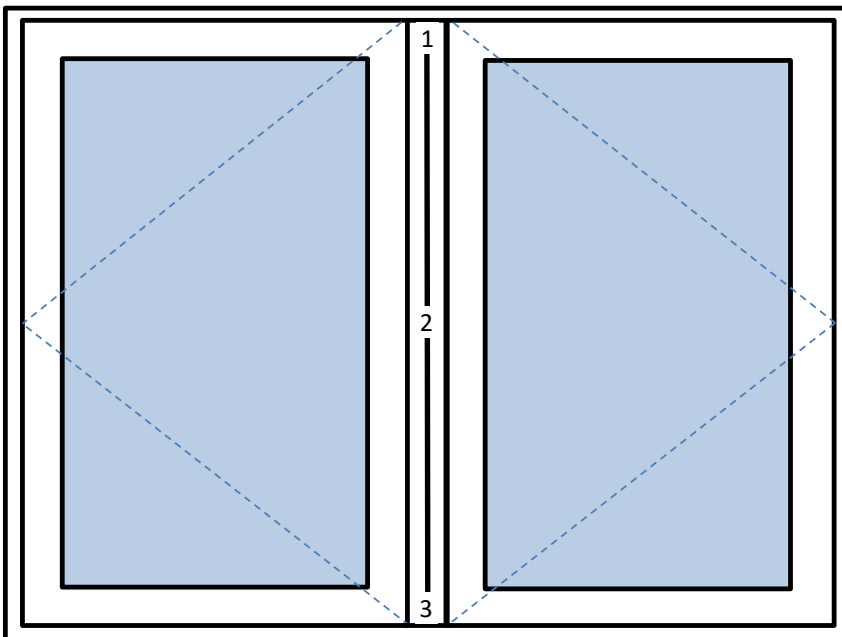


Positions of water leakage and significant air leakage



- Water leakage points
- Significant air leakage points

Position of deflection measurement





PICTURE OF TEST WINDOW



END OF REPORT