Test Report No:	WTH2102#1-2
Date:	06/01/2021
Testing of:	Single side hung projecting casement window
Tested to:	BS 6375-1:2015+A1:2016
Prepared for:	Nico Manufacturing Ltd

CONTENTS

AUTHORISATION

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Date: 26/01/2021

For and on behalf of Nico Manufacturing Ltd Test Laboratory

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Date: 26/01/2021

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UKAS TESTING
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TEST REQUESTED BY

Origin of test request

Company Name	Nico Manufacturing Ltd
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Contact	Ian Harrison
Contact position	Sales Director

Quotation Details

Quotation No.	WTH2102
Dated:	05/01/2021

DETAILS OF TEST

Description	Single side hung
Model / type	Projecting casement window
Make / Brand	Veka
Any special requirements	

Test Specification	BS 6375-1:2015+A1:2016 Performance of windows & doors. Classification for operation and strength characteristics
Date sample received	18/04/2019
Date testing started	06/01/2021
Date testing finished	07/01/2021
Job No.	WTH2102
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.

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 number	WTH1903A
Sample details	Single side hung projecting casement window
Fabricator	Consort Ltd
Material:	PVC-U Veka part nos;- 56mm Frame, part no 101160 75mm sculptured sash, part no 103264
Finish	White gloss
Lock & keeps	Lock - Nico Multilock, part no 9191020 Keeps - Nico cast zinc keeps, part no 9003 centre & 9103 top & bottom
Hinges & protectors	Hinges - Nico standard 16" Hinge, part no 7740
Handle	Winlock white inline nonlocking
Fixings	Hinges - 4.8 x 25mm pan head pierce point to sash and frame Lock and keeps - 4.3 x 25mm c'sk head pierce point to sash and frame Cavity wedges - 4.3 x 25mm c'sk head pierce point
Weather sealing	Co-extruded gaskets
Glass (or infill)	28mm Double glazed unit. 4-20-4mm.
Glazing system	Internally bead glazed with co-extruded gaskets. Shaped 28mm bead, part no 107.155
Sample dimensions	850mm (W) x 1300mm (H)
Additional information	Cavity wedges - Veka part no 9898 & 9905 Run up block - Veka part no 109.380

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 9A
BS EN 12211: 2016	7.2 Deflection test	Class C3
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"

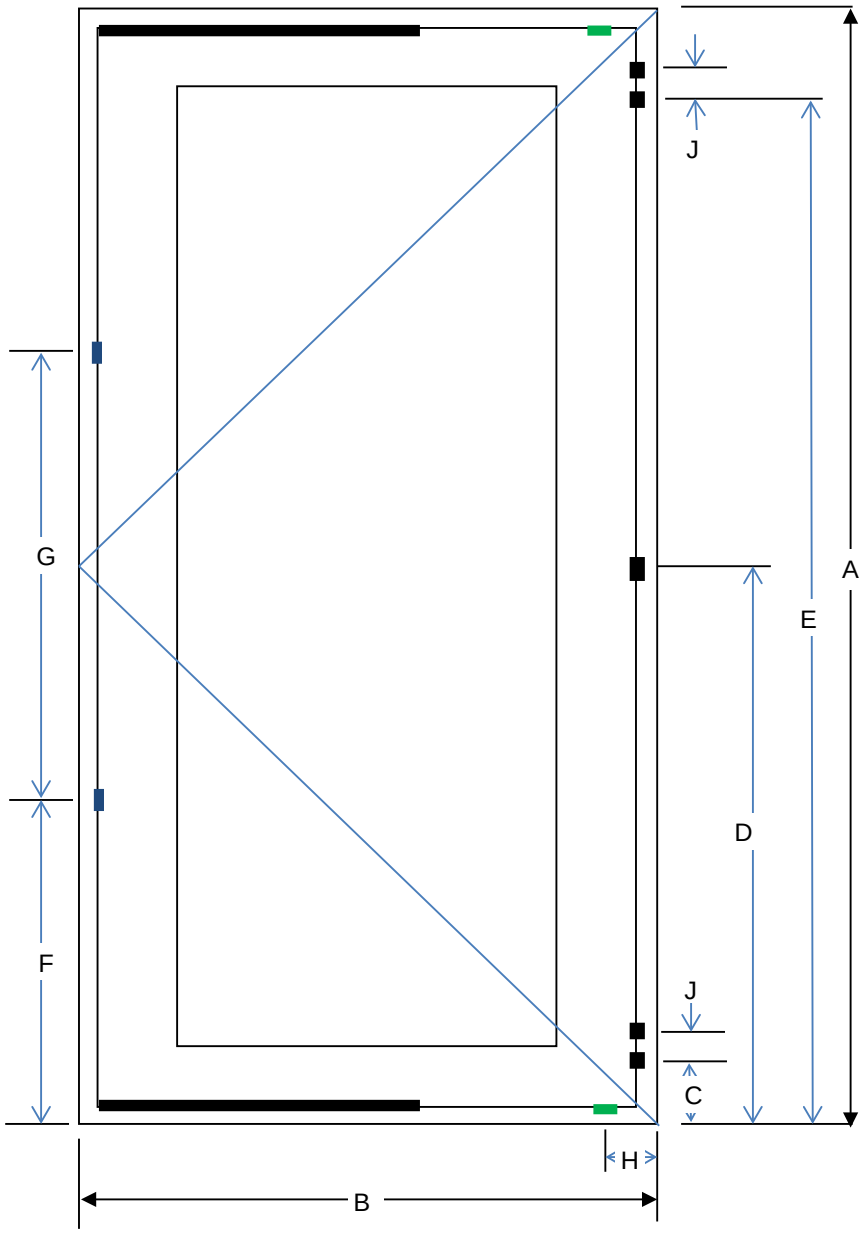
Exposure category classification in accordance with BS 6375-1:2015+a1:2016 (clauses 6, 7 & 8)

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
1600	4	600	9A	600	C4	1600	800	2400

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



Run up block

Weather wedge

A	=	1300	mm
B	=	850	mm
C	=	120	mm
D	=	660	mm
E	=	1120	mm
F	=	450	mm
G	=	400	mm
H	=	80	mm
j	=	70	mm

AIR PERMEABILITY: BS EN 1206: 2016

Closing condition of window	Latched
Window surfaces clean and dry	Yes
Window opened and closed before applying pressure pulses	Yes
Three positive pressure pulses applied	Yes

Sample No	WTH1903A	Temperature	19°C	Humidity	42%RH	Date	06/01/2021

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	0.00	0.00	0.00
100	0.00	0.00	0.00
150	0.00	0.00	0.00
200	0.00	0.00	0.00
250	0.00	0.00	0.00
300	0.51	0.47	0.13
450	-0.08	-0.07	-0.02
600	-0.04	-0.04	-0.01

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	0.00	0.00	0.00
100	0.00	0.00	0.00
150	0.00	0.00	0.00
200	0.00	0.00	0.00
250	0.00	0.00	0.00
300	0.00	0.00	0.00
450	0.25	0.23	0.07
600	0.24	0.22	0.06

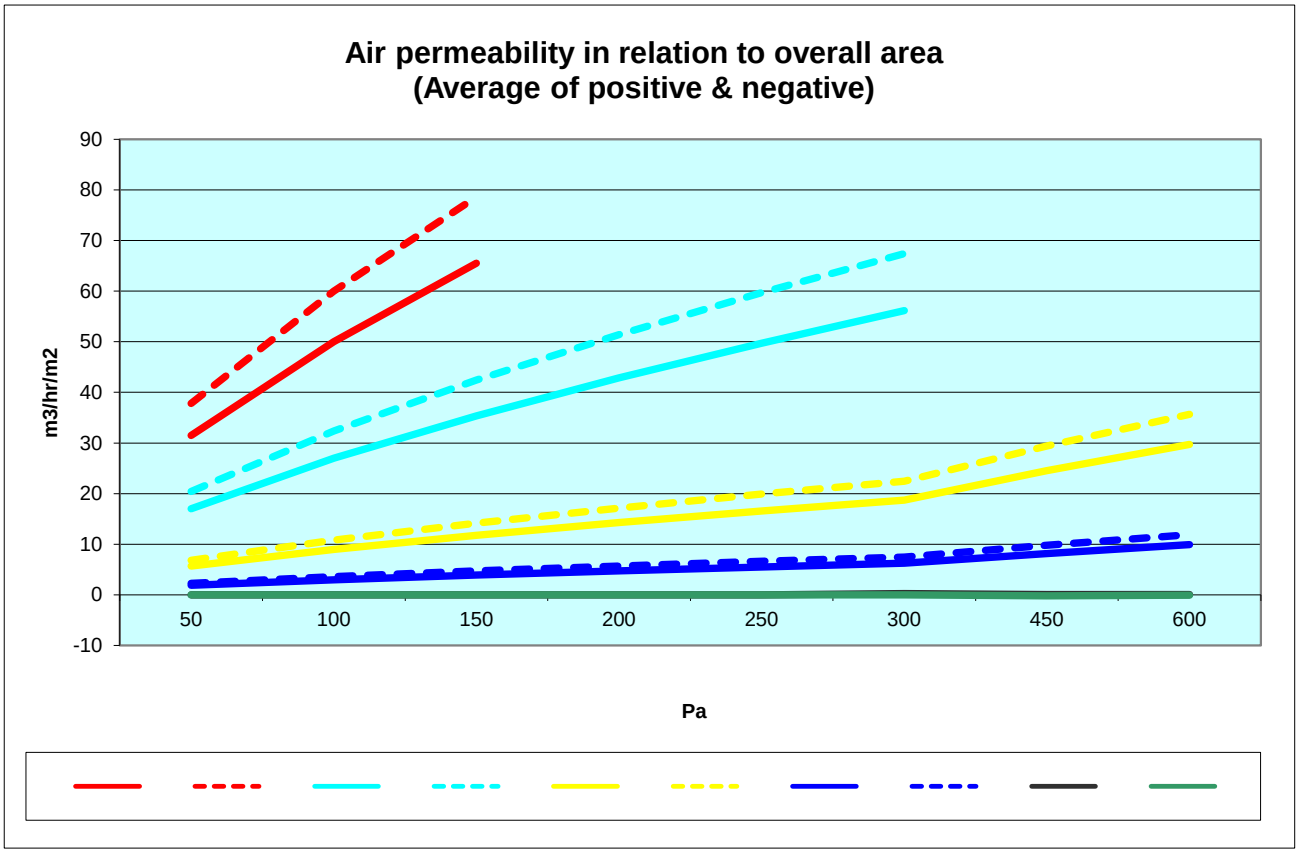
Table 3 - Air permeability averages with positive and negative pressures

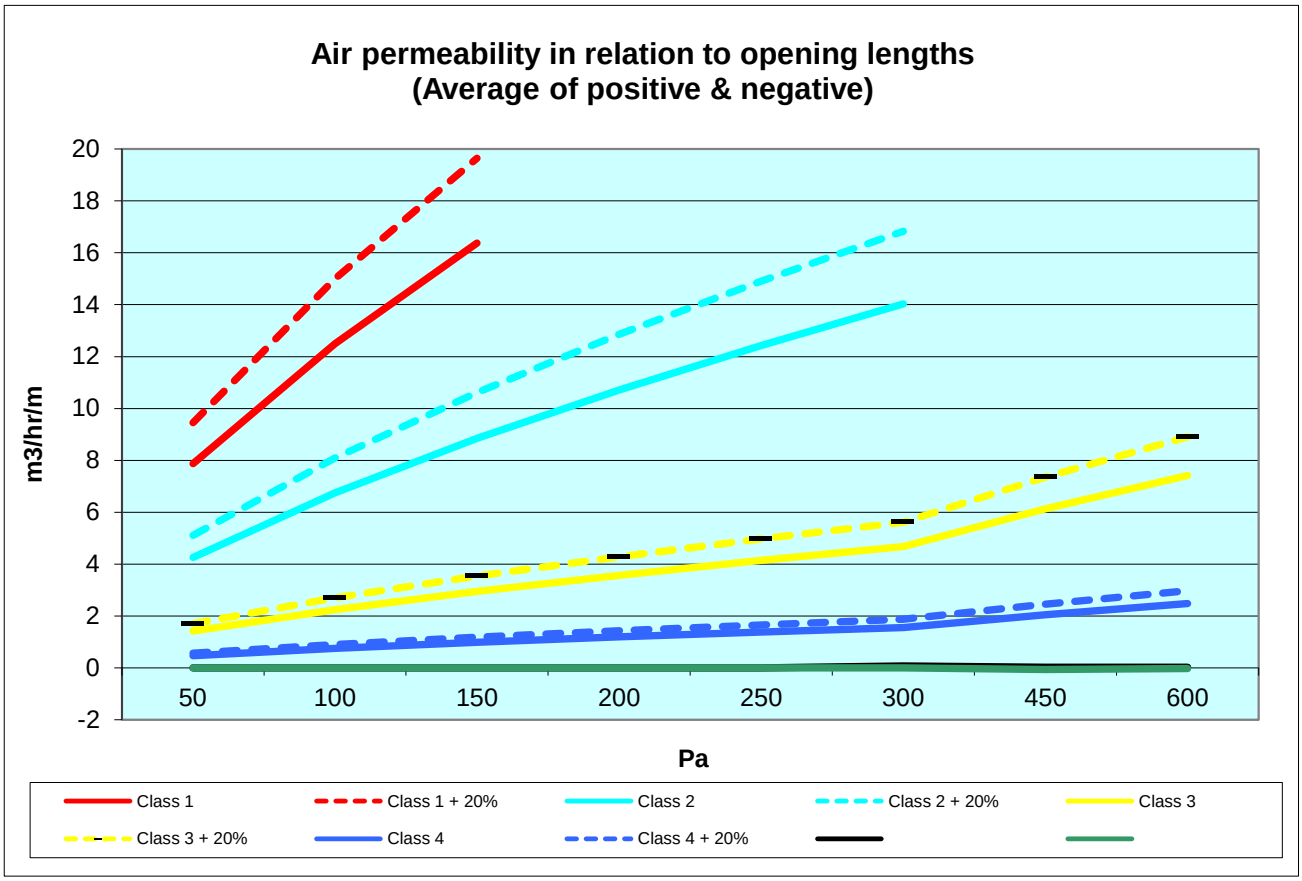
Pressure differential Pa	Air flow per average unit area of test sample $m^3/h/m^2$	Air flow average per metre of opening joints $m^3/h/m$
50	0.00	0.00
100	0.00	0.00
150	0.00	0.00
200	0.00	0.00
250	0.00	0.00
300	0.23	0.07
450	0.08	0.02
600	0.09	0.03

Total surface area of test sample (m^2)
1.11

Total length of opening joints (m)
3.84

AIR PERMEABILITY GRAPHS





Sample No	WTH1903A	Temperature	19°C	Humidity	39%RH	Date	07/01/2021

WATERTIGHTNESS: BS EN 1027: 2016

Watertightness data (Test method 1A)

Maximum test pressure	600
Pressure pulses	660

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

Closing condition of window	Latched
Window surfaces clean and dry	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%	51	5 +1/-0	5	None		
100 +/-5%	101	5 +1/-0	5	None		
150 +/-5%	151	5 +1/-0	5	None		
200 +/-5%	200	5 +1/-0	5	None		
250 +/-5%	250	5 +1/-0	5	None		
300 +/-5%	301	5 +1/-0	5	None		
450 +/-5%	450	5 +1/-0	5	None		
600 +/-5%	600	5 +1/-0	5	None		

Laboratory Conditions

Air pressure (mbar)	1018
Laboratory air temp. (ºC)	19
Relative humidity (%)	39

Number of spray nozzles	2
Total flow rate (LPM)	4

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

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Testing of Single side hung projecting casement window	
Testing to Weathertightness test BS 6375: Part 1	Date 07/01/2021

Sample No	WTH1903A	Temperature	19°C	Humidity	40%RH	Date	07/01/2021

RESISTANCE TO WIND LOAD: BS EN 12211: 2016

Closing condition of window	Latched
Window surfaces clean and dry	Yes
Window opened and closed before applying pressure pulses	Yes
Three positive pressure pulses applied	Yes

Deflection test: Positive pressure P1= 1600 Pa

Section being measured: Hinge side of sash		Deflection gauge readings (mm)				Measured Length	Relative deflection
3 pulses of	1760	1	2	3	Net deflection		
Pre-test reading		20.0	20.0	20.0			
Max reading		20.9	22.1	20.8			
Net deflection under load		0.9	2.1	0.8	1.3	1180	1/ 944
Residual reading		20.1	20.0	20.0			

Deflection test: Negative pressure P1= 1600 Pa

Section being measured: Hinge side of sash		Deflection gauge readings (mm)				Measured Length	Relative deflection
3 pulses of	1760	1	2	3	Net deflection		
Pre-test reading		20.0	20.0	20.0			
Max reading		18.5	16.6	18.9			
Net deflection under load		-1.5	-3.4	-1.1	-2.1	1180	1/ -560
Residual reading		20.0	19.9	20.0			

Test conclusion:		Worst case deflection	1/ -560	Classification	C

Cyclic repeated pressure test P2= 800 Pa

50 cycles +/- at 800 Pa	No damage or functioning defects	**Pass**

Safety test P3= 2400 Pa

1 cycle +/- at 2400 Pa	Sample remained closed with no parts becoming detached	**Pass**

Laboratory Conditions

Air pressure	1018.0	mbar
Air temperature	19.0	°C
Relative humidity	39.0	%

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	Relatitive frontal defleection		
	A	B	C
1	A1	B1	C1
2	A2	B2	C2
3	A3	B3	C3
4	A4	B4	C4
5	A5	B5	C5

Sample No	WTH1903A	Temperature	19°C	Humidity	38%RH	Date	07/01/2021

AIR PERMEABILITY: BS EN 1206: 2016

Closing condition of window	Latched
Window surfaces clean and dry	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 m³/h	Air flow per unit area of test sample m³/h/m²	Air flow per metre of opening joints m³/h/m
50	-0.01	-0.01	0.00
100	-0.01	-0.01	0.00
150	-0.01	-0.01	0.00
200	-0.01	-0.01	0.00
250	-0.01	-0.01	0.00
300	0.00	0.00	0.00
450	-0.62	-0.56	-0.16
600	-0.40	-0.37	-0.11

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	0.00	0.00	0.00
100	0.00	0.00	0.00
150	0.00	0.00	0.00
200	0.00	0.00	0.00
250	0.00	0.00	0.00
300	0.00	0.00	0.00
450	0.17	0.16	0.04
600	0.23	0.21	0.06

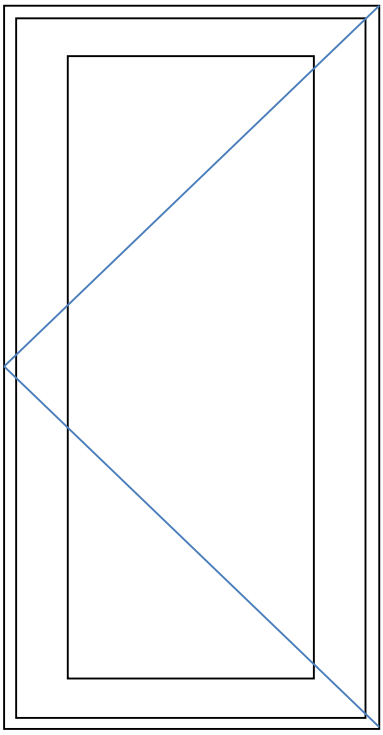
Table 3 - Air permeability averages with positive and negative pressures

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	0.00	0.00
100	0.00	0.00
150	0.00	0.00
200	0.00	0.00
250	0.00	0.00
300	0.00	0.00
450	-0.20	-0.06
600	-0.08	-0.02

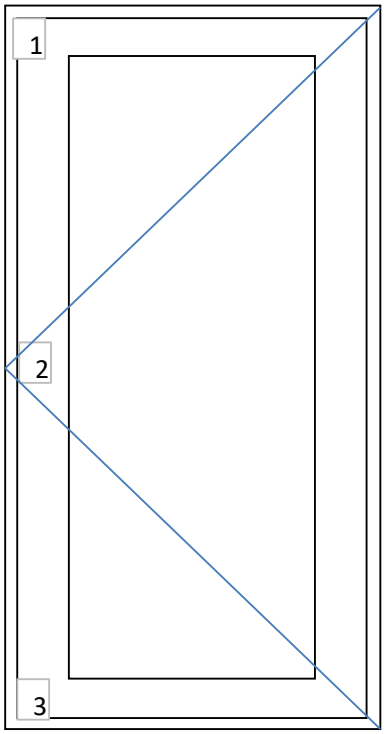
Total surface area of test sample (m²)
1.11

Total length of opening joints (m)
3.84

Positions of water leakage and significant air leakage



Position of deflection measurement



PICTURE OF TEST WINDOW

END OF REPORT