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BRITISH BOARD OF AGRÉMENT TEST REPORT No 57513

NORDAN UK LIMITED - TESTS TO DETERMINE THE WEATHERTIGHTNESS PERFORMANCE AT REVIEW OF THE NORDAN TE, TIMBER, OUTWARD OPENING DOOR SYSTEM, SUBJECT OF BBA CERTIFICATE 07/4476

CONTENTS

Approved By:

Mark Beynon
(Senior Test Technician)

Date: 19 October 2015

Authorised By:

Stuart Sadler
(Head of Test)

Date: 23 October 2015

On behalf of the British Board of Agrément

Client:	Nordan UK Ltd 96 Kirk Road Wishaw North Lanarkshire ML2 7NS
Requested by:	Graham Corley - BBA
Job No:	T9 57513 (S2 57480)
Work Period:	October 2015

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1 REPORT CONDITIONS

1.1 This Report:

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- relates only to the specified tests and test conditions described herein
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2 INTRODUCTION

The tests reported here were commissioned to determine the performance of the samples listed in Section 4 *Samples* when tested to the requirements laid out in Section 3 *Test method*.

The results are only valid for the conditions under which the test was conducted and for the specific samples tested.

3 TEST METHOD

Tests were conducted and the sample was classified in accordance with BS EN 14351-1 : 2006 +A1 : 2010 *Windows and doors – Product standard, performance characteristics – Part 1: Windows and external pedestrian doorsets without resistance to fire and/or smoke leakage characteristics.*

Using the following standards:

BS EN 1026 : 2000 *Windows and doors – Air permeability – Test method.*
BS EN 1027 : 2000 *Windows and doors – Watertightness – Test method.*
BS EN 12211 : 2000 *Windows and doors – Resistance to wind – Test method.*
BS EN 12207 : 2000 *Windows and doors – Air permeability – Classification.*
BS EN 12208 : 2000 *Windows and doors – Watertightness – Classification.* (Incorporating Corrigendum No 1).
BS EN 12210 : 2000 *Windows and doors – Resistance to wind – Classification.* (Incorporating Amendment Nos 14690 and Corrigendum No 1).

All testing was carried out using the BBA Schulten Window Test Facility.

4 SAMPLES

BBA Ref/Lot	Quantity	Description
S2/57480/1	1	NorDan, TE, single leaf, outward opening, doorset, 1088 mm wide by 2388 mm high. Poland factory example.

See Appendix A for full sample description

5 RESULT SUMMARY

Test	**Air permeability** BS EN 1026 : 2000 (before gusting)
Class	BS EN 14351-1 : 2006 (+A1:2010) = **Class 4**

Test	**Watertightness** BS EN 1027 : 2000
Class	BS EN 14351-1 : 2006 (+A1:2010) - BS EN 12208 : 2000 = **9A**

Test	**Resistance to wind load** BS EN 12211 : 2000
Class	BS EN 14351-1 : 2006 (+A1:2010) = **CE2400**

Test	**Air permeability** BS EN 1026 : 2000 (after gusting)
Class	BS EN 14351-1 : 2006 (+A1:2010) = **Class 4**

Refer to Appendix B – *Test data recording* for full test results.

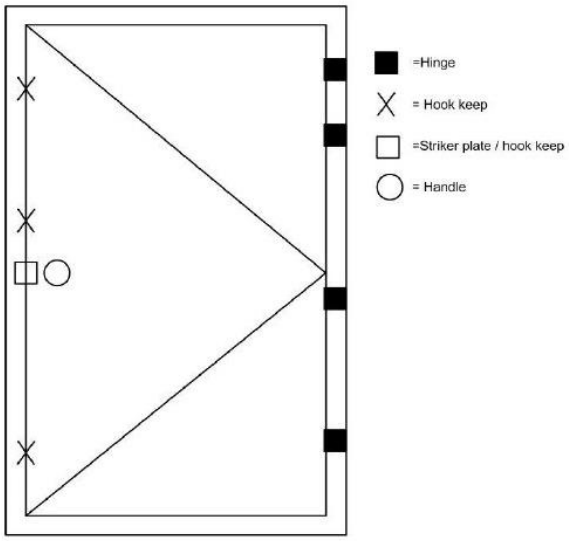
APPENDIX A - SAMPLE DETAILS

The sample detail sheets were provide by the BBA

CHARACTERISATION OF WINDOW/DOOR/SUBFRAME TEST SAMPLE

Client: **Sample (Batch) No** **Job No:**

1. SKETCH OF SAMPLE
(viewed from outside)



Window to subframe fixing method: Screws

2. DIMENSIONS: (mm)

Overall: 2400 X 1100

Sashes: 2330 X 990

3. DESCRIPTION:
White Nordan side hung, outward opening, single leaf timber door, featuring external beading and 28mm DGU.

4. PROFILES:

Frame:	N/A
Transom/Mullion:	N/A
Sash:	N/A
Glazing Bead:	N/A
Weatherseal:	Black flipper
Others:	N/A

5. DRAINAGE AND EQUALISATION:

Bottom rebate: N/A

Underneath sash: N/A

External drainage in
bottom frame member: N/A

Equalisation vents: sash - N/A
Frame - N/A

Comments: Drainage not required for security test

6. REINFORCING:

Main frame: N/A

Transom: N/A

Mullion: N/A

Sash: N/A

Comments: N/A

7. FURNITURE:

3X hook keeps, brown plastic, unmarked
1X striker plate / hook keep, silver metal, labelled ASSA ABLOY
1X 2 part threshold, silver metal, unmarked
1X butt hinges, white metal, labelled NORDAN
1X door stay, lockable, silver metal, unmarked.
1X espagnolette 2200mm, silver metal, labelled ASSA ABLOY, featuring:
- 4X hooks
- 1X spring bolt

1x 2 part euro type handle, white metal, labelled NORDAN (Hoppe)
1X 2 part cylinder, key locking/thumb turn, grey metal, labelled ASSA ABLOY

Characterisation by: Graham Corley	**Date: 01/10/2015**

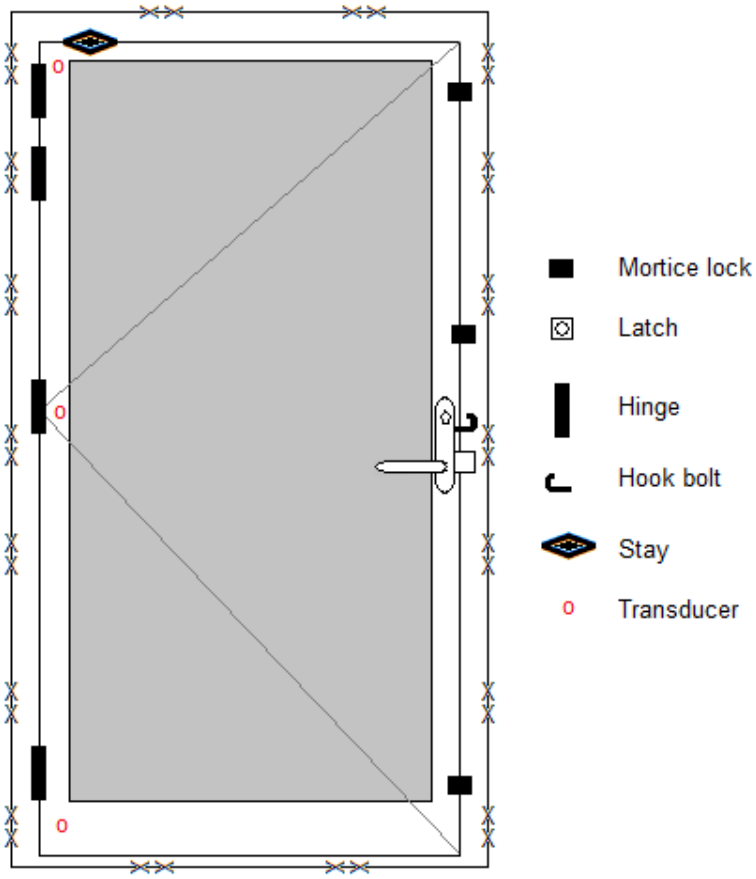
APPENDIX B - TEST DATA RECORDING

Test Data Recording

SCHULTEN TEST RIG
WINDOW & DOOR TEST - DATA RECORDING

Sample No:	S2/57480/1	Operator:	MAB
Date:	14/10/15	Job No:	57513
Sample details:	NorDan, double glazed (4/16/4), timber, open out, fully glazed door, 1190mm wide by 1190mm high.		

Outline sketch viewed from the inside:



Window to subframe fixing method: Wood screws

Position of visible window to subframe fixings 'X' on sketch above

Note that any references in this report to right-hand side (RHS) and left-hand side (LHS) are assuming the sample is being viewed from its internal face.

The sample was conditioned for four hours prior to test at an ambient temperature between the range of 10ºC to 30ºC and a relative humidity of 25% to 75%.

The results contained in these worksheets do not in any way assess the joint between the sample and the test surround, and hence the joint between the window/door and the fabric of any building is not covered by this assessment.

WINDOW & DOOR TEST - DATA RECORDING

Sample No: S2/57480/1 Operator: MAB

Date: 14-Oct-15 Job No: T9/57513

1. Air permeability BS EN 1026:2000 (before gusting)

Length of opening joint (m) =	6.54
Total area of sample (m²) =	2.6

Air Temperature (°C) =	20.2	Air Pressure (mbar) =	1012.6
Room Humidity (%) =	45	Vo Calculation =	0.998923274

Setting pulses 3 x 0 to Pmax +10% (500Pa min)

Positive Pressure

Pressure	LEAKAGE (m^3hr^{-1})				Net Leakage	
(Pa)	Sealed	calc	Unsealed	calc	m^{-1}	m^{-2}
50	6.6	6.6	6.6	6.6	0.00	0.00
100	9.5	9.5	9.6	9.6	0.02	0.04
150	11.8	11.8	12.1	12.1	0.05	0.12
200	13.7	13.7	14.1	14.1	0.06	0.15
250	15.5	15.5	15.9	15.9	0.06	0.15
300	17.2	17.2	17.6	17.6	0.06	0.15
450	21.5	21.5	22.0	22.0	0.08	0.19
600	25.1	25.1	25.8	25.8	0.11	0.27

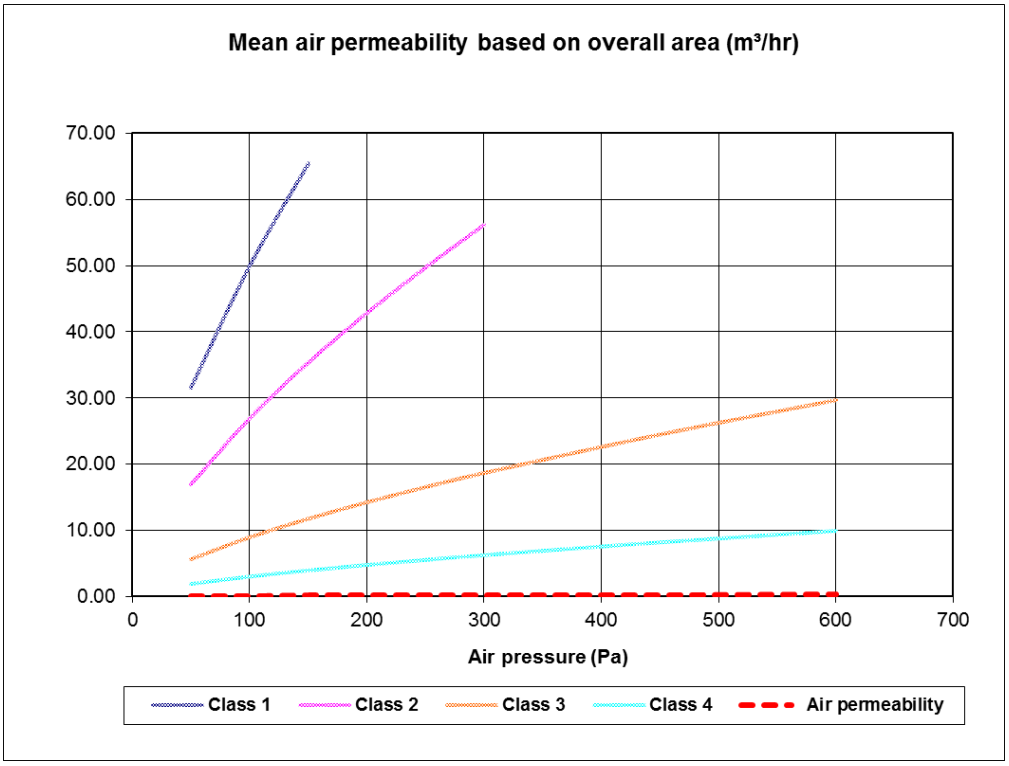
Negative Pressure

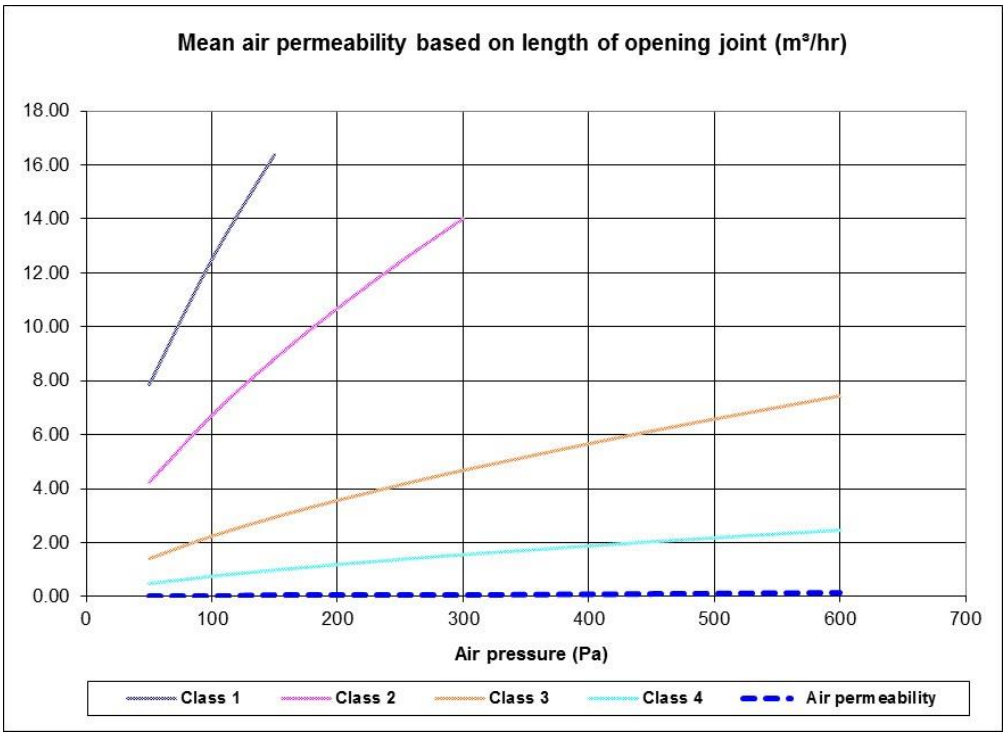
Pressure	LEAKAGE (m^3hr^{-1})				Net Leakage	
(Pa)	Sealed	calc	Unsealed	calc	m^{-1}	m^{-2}
50	7.0	7.0	7.0	7.0	0.00	0.00
100	10.2	10.2	10.4	10.4	0.03	0.08
150	12.6	12.6	13.0	13.0	0.06	0.15
200	14.7	14.7	15.1	15.1	0.06	0.15
250	16.6	16.6	17.0	17.0	0.06	0.15
300	18.3	18.3	18.9	18.9	0.09	0.23
450	22.8	22.8	23.6	23.6	0.12	0.31
600	26.7	26.7	27.8	27.8	0.17	0.42

BS EN 12207: Class (see individual graphs)	BS 6375 -1:2009 = Class 4 (600Pa)
BS EN 14351-1:2006 (+A1:2010) = Class 4	

AIR PERMEABILITY CLASSIFICATION GRAPHS

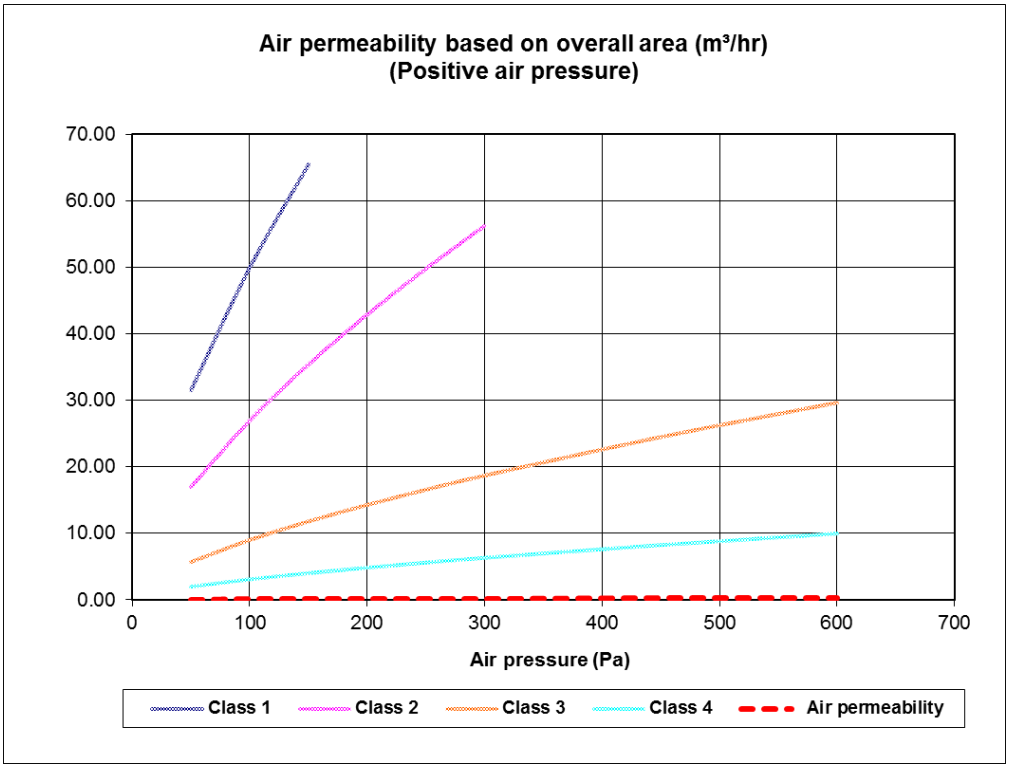
Derived from the corrected average value of both positive and negative readings as described in BS 6375 -1:2009 and BS EN 14351-1:2006 (+A1:2010)

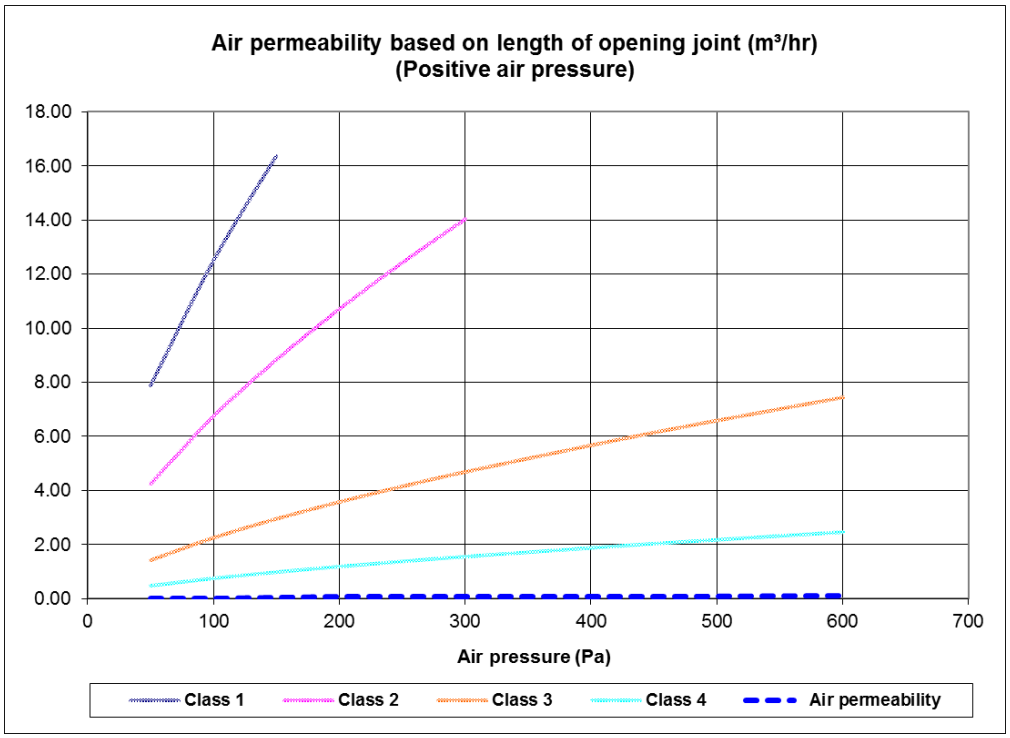




AIR PERMEABILITY CLASSIFICATION GRAPHS

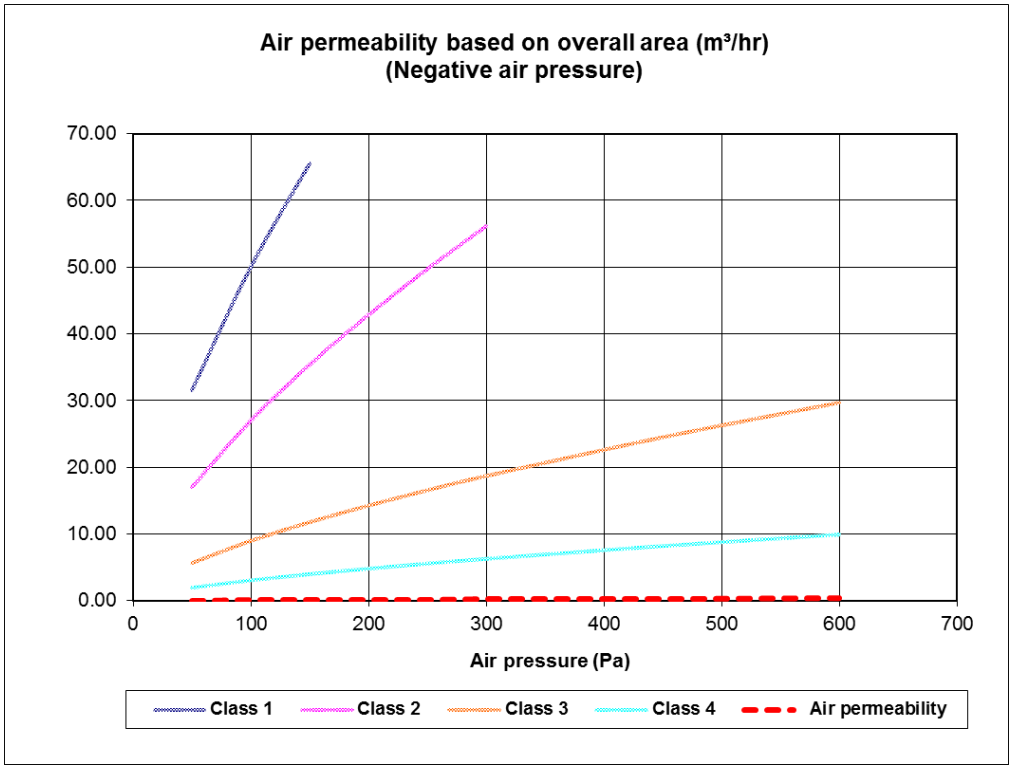
Individual graphs derived from the positive air pressure readings
BS EN 12207

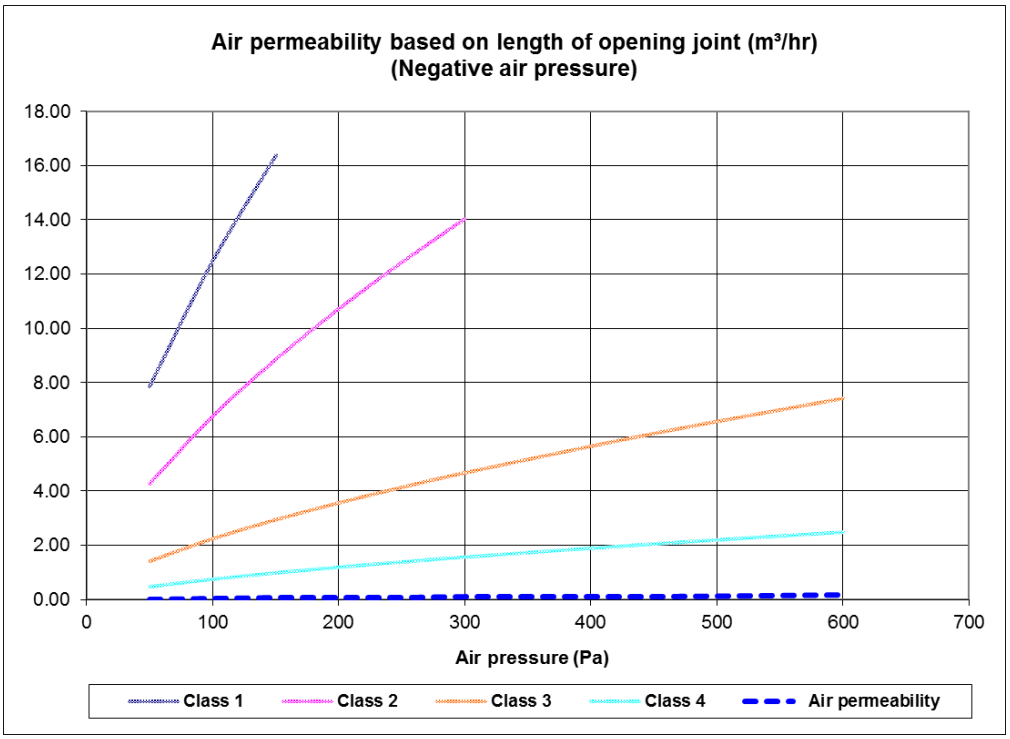




AIR PERMEABILITY CLASSIFICATION GRAPHS

Individual graphs derived from the negative air pressure readings
BS EN 12207





WINDOW & DOOR TEST - DATA RECORDING

Sample No: S2/57480/1 Operator: MAB

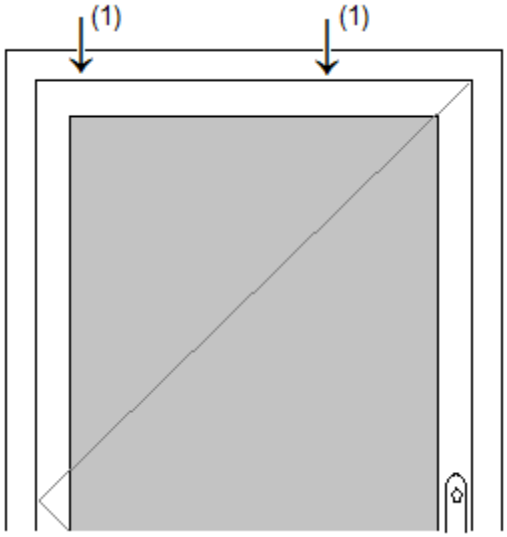
Date: 15/10/15 Job No: T9/57513

2. Watertightness BS EN 1027:2000 (Method 1A)

Water flow rate (l min^{-1}) = 6
Water temperature (°C) = 15.3 to 16.6
Ambient temperature (°C) = 19.6
Test chamber (°C) = 19.3
Room humidity (%) = 46
Atmos (mbar) = 1020
Setting pulses 3 x 0 to Pmax +10% (500Pa min)
Water penetration as indicated:

Time duration (mins)	Pressure (Pa)	Comments (Position and time of any leakage)
15	0	No visible leakage
5	50	No visible leakage
5	100	No visible leakage
5	150	No visible leakage
5	200	No visible leakage
5	250	No visible leakage
5	300	No visible leakage
5	450	No visible leakage
5	600	No visible leakage
5	750	Leaks from along the top edge weather-seal (1) after 2 minutes at 750Pa

Position of water penetration



BS 6375 -1:2009: Class 9A (600Pa)	
BS EN 14351-1:2006 (+A1:2010) - BS EN 12208 = Class 9A	

WINDOW & DOOR TEST - DATA RECORDING

Sample No:	S2/57479/1	Operator:	MAB
Date:	12/10/15	Job No:	57514

3. Resistance to wind load BS EN 12211:2000 (+ and – refer to pressure in box)

Deflection limit = Length of measured member = 2250mm:- (see page 1)

Class A = 15.0mm, Class B = 11.3mm, Class C =7.5mm

(a) **Setting pulses** 3 x ± 2640 Pa

(b) **P1 deformation test**

Pressures applied: ± 2400Pa

Comments: No visible damage

Pressure (Pa)	Deformation of frame member (1) (mm)	Deformation of frame member (fraction)
+ 2400	1.8	1/1250
– 2400	2.0	1/1125

(c) **P2 repeated test**

Pressures applied: 50 cycles of 1200Pa negative to 1200Pa positive

Comments: No visible damage

Air leakage same Class (*) as before gusting?

Mean values (BS 6375) Yes

Mean values (BS EN 14351) Yes *(* Within 20% of the Class limits)*

Individual (BS EN 12210) N/A *(* Note, allowed to be +20% Class limits)*

BS 6375-1:2009: Class AE2400 (Pa)
BS EN 14351-1:2006 (+A1:2010) = CE2400

(1) The test method specifies measurement of displacement accuracy of 0.1mm, the quoted displacement accuracy of the instruments involved is 0.2mm.

WINDOW & DOOR TEST - DATA RECORDING

Sample No:	S2/57480/1	Operator:	MAB
Date:	15-Oct-15	Job No:	T9/57513

4. Air permeability BS EN 1026:2000 (after gusting)

Length of opening joint (m) =	6.54
Total area of sample (m²) =	2.6

Air Temperature (°C) =	19.6	Air Pressure (mbar) =	1020
Room Humidity (%) =	46	Vo Calculation =	1.008286668

Setting pulses 3 x 0 to Pmax +10% (500Pa min)

Positive Pressure

Pressure	LEAKAGE (m^3hr^{-1})				Net Leakage	
(Pa)	Sealed	calc	Unsealed	calc	m^{-1}	m^{-2}
50	7.6	7.7	7.7	7.8	0.02	0.04
100	11.0	11.1	11.2	11.3	0.03	0.08
150	13.5	13.6	14.0	14.1	0.08	0.19
200	15.8	15.9	16.4	16.5	0.09	0.23
250	17.9	18.0	18.4	18.6	0.08	0.19
300	19.8	20.0	20.3	20.5	0.08	0.19
450	24.6	24.8	25.3	25.5	0.11	0.27
600	28.9	29.1	29.6	29.8	0.11	0.27

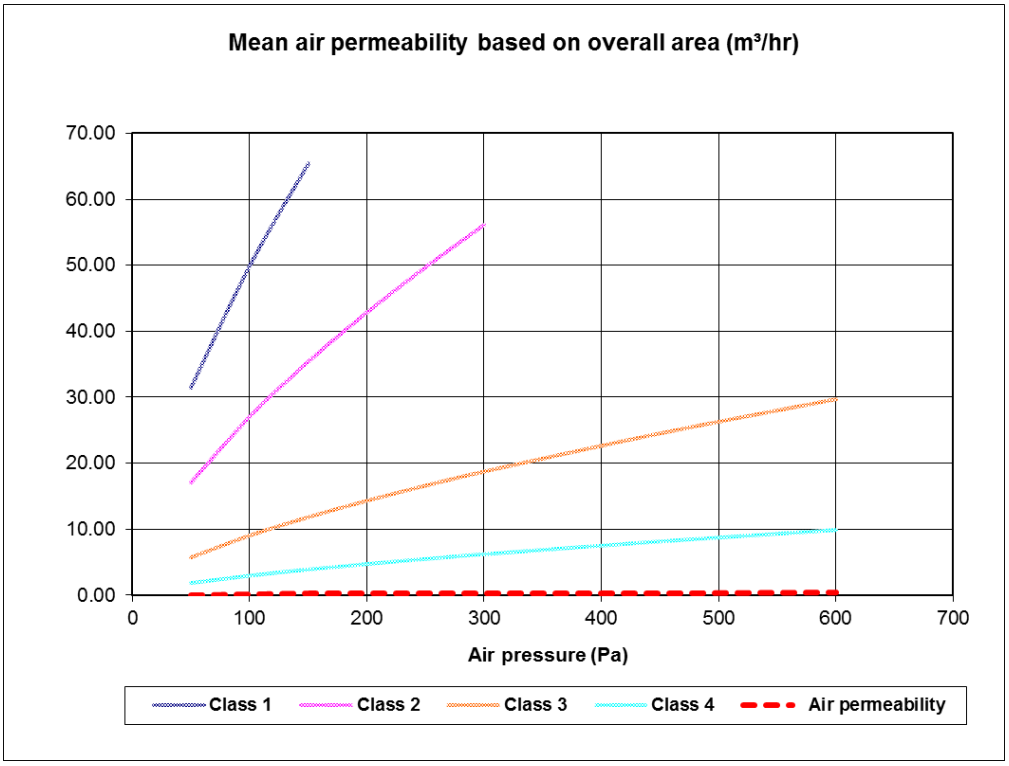
Negative Pressure

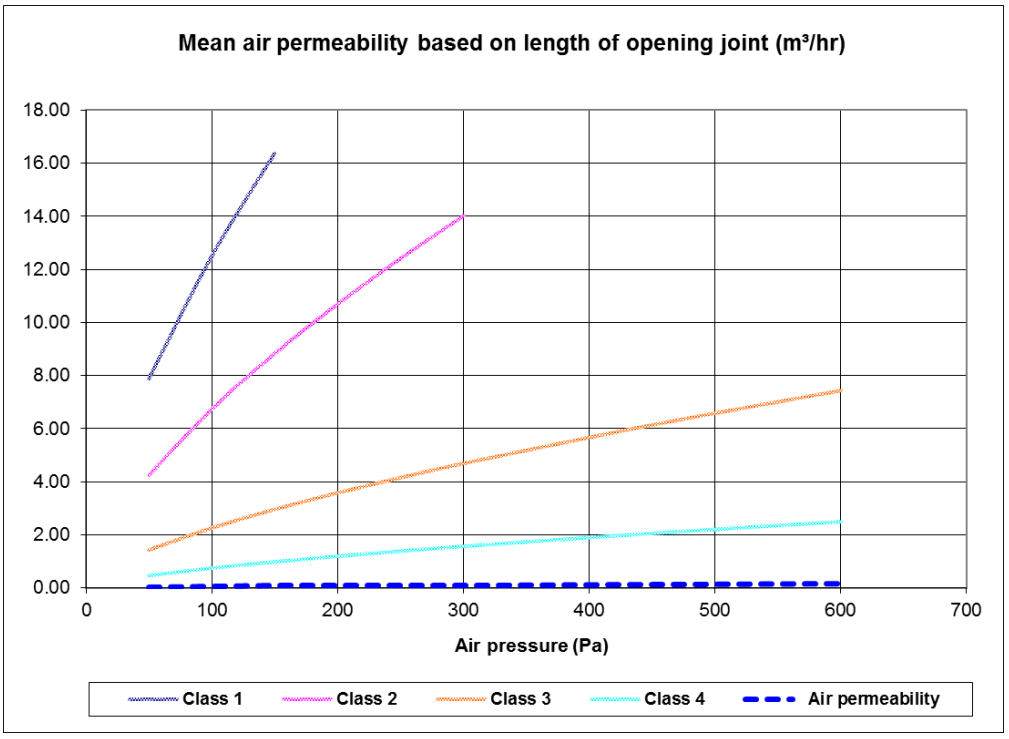
Pressure	LEAKAGE (m^3hr^{-1})				Net Leakage	
(Pa)	Sealed	calc	Unsealed	calc	m^{-1}	m^{-2}
50	8.4	8.5	8.5	8.6	0.02	0.04
100	11.8	11.9	12.2	12.3	0.06	0.16
150	14.6	14.7	15.1	15.2	0.08	0.19
200	17.0	17.1	17.6	17.7	0.09	0.23
250	19.3	19.5	19.9	20.1	0.09	0.23
300	21.0	21.2	21.8	22.0	0.12	0.31
450	26.4	26.6	27.2	27.4	0.12	0.31
600	30.8	31.1	32.3	32.6	0.23	0.58

BS EN 12207: Class (see individual graphs)	BS 6375 -1:2009 = Class 4 (600Pa)
BS EN 14351-1:2006 (+A1:2010) = Class 4	

AIR PERMEABILITY CLASSIFICATION GRAPHS

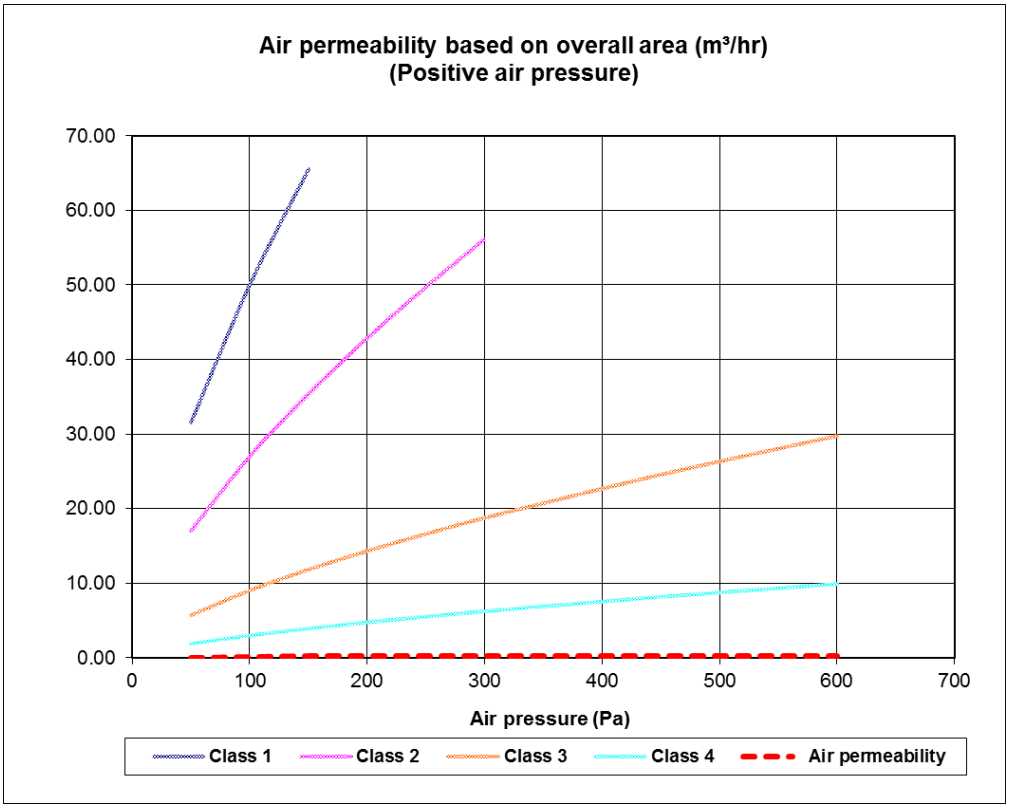
Derived from the corrected average value of both positive and negative readings as described in BS 6375 -1:2009 and BS EN 14351-1:2006 (+A1:2010)

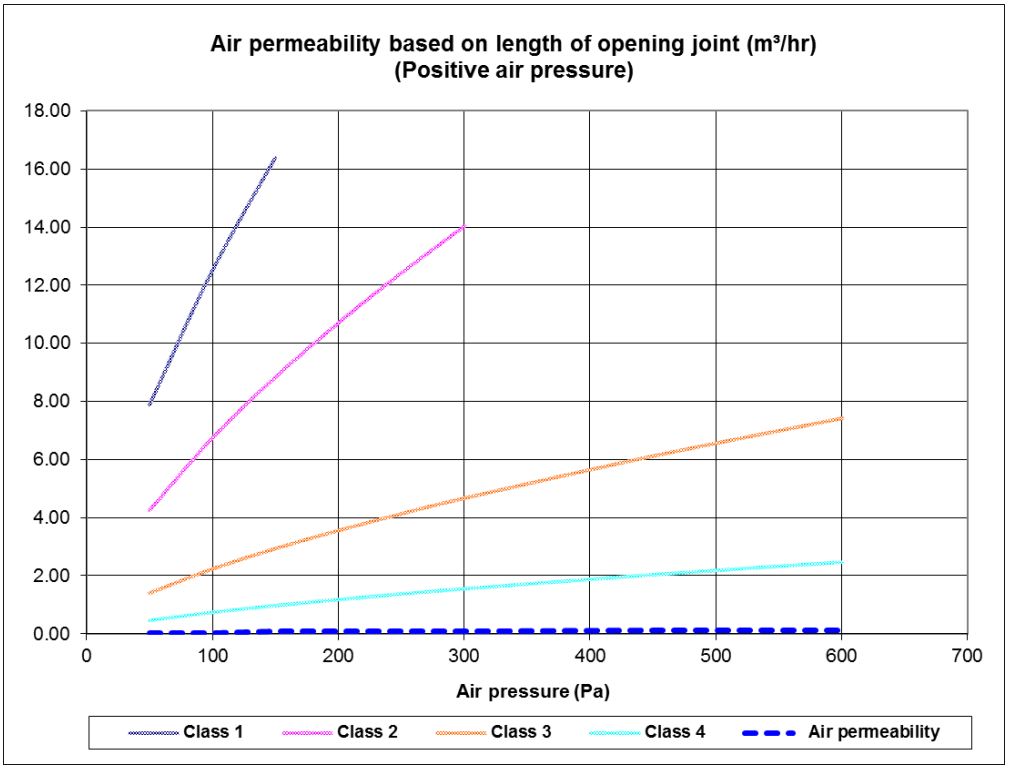




AIR PERMEABILITY CLASSIFICATION GRAPHS

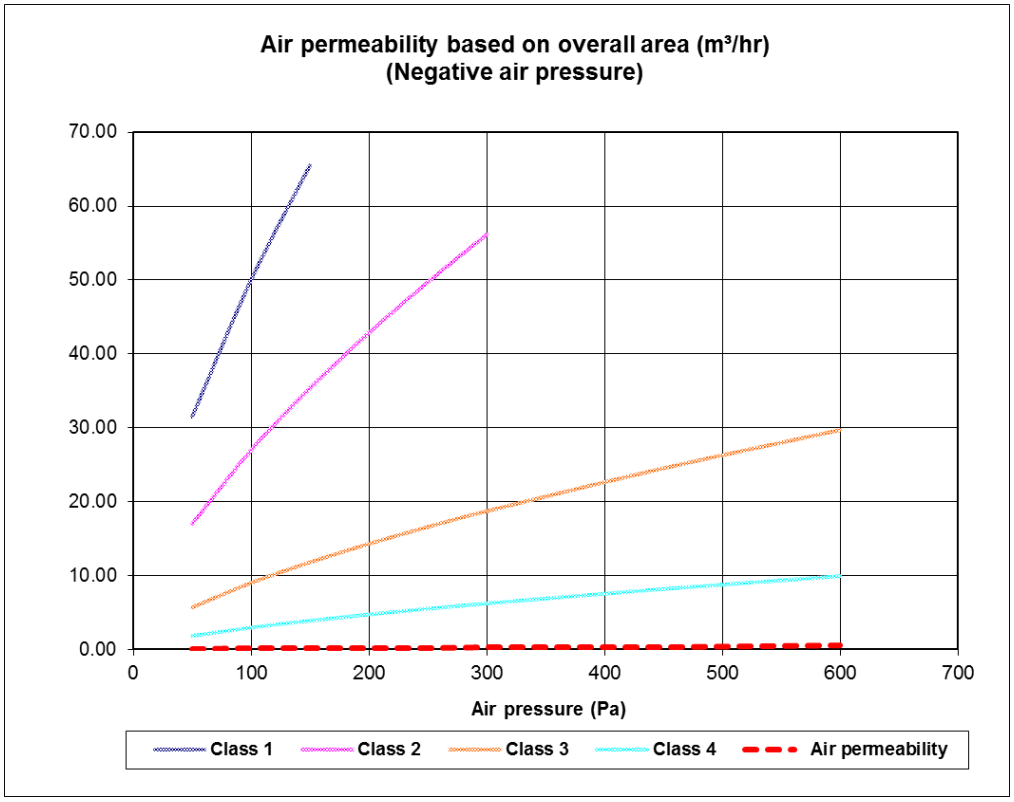
Individual graphs derived from the positive air pressure readings
BS EN 12207

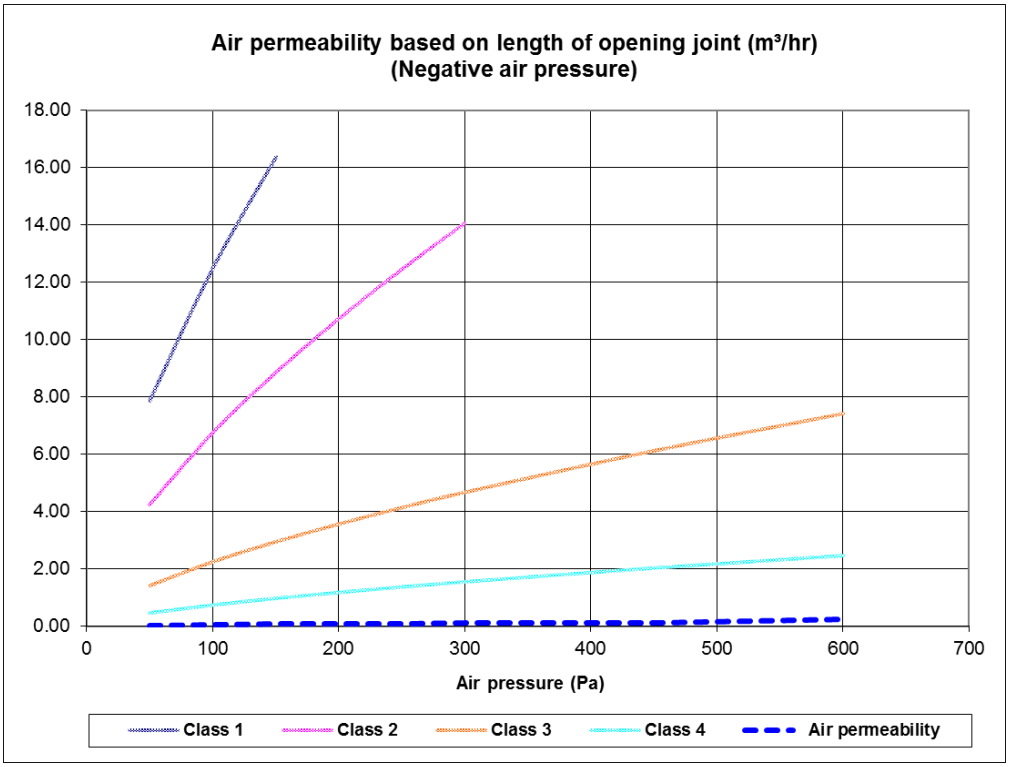




AIR PERMEABILITY CLASSIFICATION GRAPHS

Individual graph derived from the negative air pressure readings
BS EN 12207





WINDOW & DOOR TEST - DATA RECORDING

Sample No:	S2/57480/1	Operator:	MAB
Date:		Job No:	T9/57513

5. P3 safety test BS EN 12211:2000 (+ and – refer to pressure in box)

Pressure applied: – 3600Pa followed by + 3600Pa

Comments: No visible damage

BS 6375-1:2009: Class AE2400 (Pa)
BS EN 14351-1:2006 (+A1:2010) = CE2400