Test Report 9788587.

Smart Systems Limited

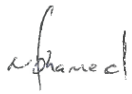
Incorporating Smart Extrusions

Introduction.

This report has been prepared by David Vinyard and relates to the activity detailed below:

Job/Registration Details		Client Details
Job number:	**9788587**	Smart Systems Limited Incorporating Smart Extrusions Arnolds Way Yatton BS49 4QN United Kingdom
Job type:	Testing Samples Submitted	
Start Date:	23/09/2019	
Test type:	Direct	
Sample ID:	10184008 10187634	
Registration:	**NA**	
Protocol:	NA	
Quality system:	NA	
Registration:	**NA**	
Protocol:	NA	
Quality system:	NA	

The report has been approved for issue by Mohamed Abukar – Subject Matter Expert

Approved For Issue	
	Issue Date: 22 July 2020

Objectives.

Direct testing

Product Scope.

Smart Systems traditional and modern designer doorsets

Report Summary.

The samples were received on 23 September 2019 and the testing was started on 23 September 2019.

The samples submitted complied with the requirements of the test work conducted.

Sample Selection.

The samples submitted for tests were selected using the PCP 519 Scheme Document Specification.
Each sample was submitted for test mounted in a 75mm x 100mm timber subframe in accordance with the manufacturer's installation requirements. The test sample was manufactured by the client.

Clause 5 Sequence of Tests.

The sequence of testing the samples followed that detailed in Clause 5 of BS6375-1:2015.

Clause 5 Performance Requirements.

The performance of each sample was assessed against the requirements detailed in Table 1 Exposure Categories and Classifications.

The results contained within this test report are valid only for the conditions under which the tests were conducted and only for the specified products.

BS:6375-2015 Methods of Test.

1. **Operating Forces**

The operating forces acting on the sample were determined by the methods given in BS EN 12046-2:2000.

2. **Air Permeability**

The air permeability of the sample was determined by the method given in BS 6375-1:2015.

3. **Watertightness**

The watertightness of the sample was determined by the method given in BS 6375-1:2015.

4. **Wind Resistance**

The wind resistance of the samples was determined by the methods (P1 and P2) given in BS 6375-1:2015.

5. **Repeat Tests**

After testing for resistance to wind loading (P1 and P2) the air permeability test was repeated.

6. **Wind Resistance**

The wind resistance of the samples was determined by the method (P3) given in BS 6375-1:2015.

7. **Resistance to Vertical Loads**

The resistance to vertical loads test was carried out using the method given in BS EN 947:1999.

8. **Resistance to Static Torsion**

The resistance to static torsion test was carried out using the method given in BS EN 948:1999.

9. **Soft and Heavy Body Impact**

The resistance to soft and heavy body impact was carried out using the method given in BS EN 949:1999.

10. **Hard Body Impact**

The resistance to hard body impact was carried out using the method given in BS EN 950:1999.

Methods of Test (Continued).

11. **Closure Against Obstruction**

The closure against obstruction was carried out using the method given in BS 6375-3:2009.

12. **Basic Security**

The basic security test was carried out using the method given in BS 6375-3:2009.

13. **Repeated Opening and Closing**

The repeated opening and closing test was carried out using the method given in BS EN 1191:2000.

Note – BS 6375:3:2009 and BS EN 1191:2000 not UKAS accredited

BS6375:2015 (All Clauses) Direct Testing. Sample 1

1 off single leaf open in cassette glazed doorset with glass infill above the midrail and a standard threshold

(Sample ID No. 10184008)

Date sample received: 23 September 2019

Test Results.

1.	Air Permeability	Test sample 1 met the requirements of the Specification, in respect of Clause 6, for Test Pressure Class 2.
2.	Watertightness	Test sample 1 met the requirements of the Specification, in respect of Clause 7, for Test Pressure Class 3a.
3.	Wind Resistance	Test sample 1 met the requirements of the Specification, in respect of BS6375-2:2009, for Exposure Category C3 (1200 Pa).
4.	Operational Strength	Test sample 1 met the requirements of the Specification in respect of BS6375-2:2009.
5.	Basic Security	Test sample 1 met the requirements of the Specification in respect of BS6375-3:2009.

Classifications for Operational Strength.

Operating forces	Class 1
Vertical load	Class 2
Resistance to Static torsion	Class 2
Soft and Heavy body Impact Load bearing	Class 2
Hard body impact	Class 2
Load bearing capacity of safety devices	N/A
Closure against obstruction	Pass
Repeated opening and closing	50.000 cycles completed

Description of Sample 1. (Traditional standard threshold)

Sample Type -	Single leaf open in cassette glazed doorset with a standard threshold		
Material -	Aluminium		
Construction -	Mechanically jointed		
Fittings -	A three-point FUHR (two hook/pins and one dead bolt) locking system, key lockable 3* ERA cylinder, three dog bolts and four lift off hinges		
Glass -	Triple glazed 6.8-20-6.4-20-8.8mm laminated glass unit		
Panel -	Not applicable		
Glass Retention System -	Cassette glazing		
Weathersealing -	Double-sealed plastic weather strip		
Sample dimensions -	Overall length: Active leaf length:	1200mm 1070mm	Height: 2400mm Height: 2330mm
Date of test -	24 September 2019		
Laboratory temperature -	19.5°C		
Laboratory humidity -	71.0%RH		
Atmospheric pressure -	99.9kPa		
Test engineer -	David Vinyard		

Smarts Traditional Designer Door with Fuhr Slam Lock Standard Threshold.

Outer Frame width	1200mm	**Outer Frame Material**	Aluminium
Outer Frame height	2400mm	**Outer Frame Gasket**	
Outer Frame Part Numbers		Gasket Type	EDPM
Top	SPD702	Manufacturer	Reddiplex
Bottom	SPD702	Product Name	Flipper Gasket, Central Gasket
Lock Side	SPD702	Product Code	ACET160R, ACPD725
Hinge Side	SPD702	**Threshold**	
Outer Frame section dimensions		Manufacturer	Smart Systems
Width	70mm	Product name	Standard Threshold
Depth	62mm	Product Code	SPD702
Reinforcing:		Materials	Aluminium
Manufacturer	NA	**Outer Frame Joint Method**	
Product Name		Head	Corner Cleat
Product code		Foot	T Joint Cleat
Material			

Leaf		**Leaf Material:**	Aluminium
Leaf Width:	1126mm	**Leaf Gasket**	
Leaf Height:	2352mm	Gasket type:	EDPM
Leaf Part Numbers:		Manufacturer:	Trelleborg
Top:	SPD705	Product Name:	Flipper Gasket
Bottom:	SPD705	Product Code	ACPD724
Lock side:	SPD705	**Leaf Panel Slab**	
Hinge Side	SPD705	Manufacturer:	Smart Systems
Leaf section size		Product name:	Leaf Panel Slab
Width:	129mm	Product code:	ACPD 131
Depth:	70mm	Material:	Aluminium
Panel Moulding		**Leaf joint method**	
Manufacturer:	Smart Systems	Head:	Cleat, Glue and Tension Block
Product Name:	Moulding	Foot:	Cleat, Glue And Tension Block
Product Code:	SPD760 , SPD761		
Material:	Aluminium		
Bead			
Manufacturer:	NA		
Product Name:			
Product Code:			
Material:			
Bead Size:			

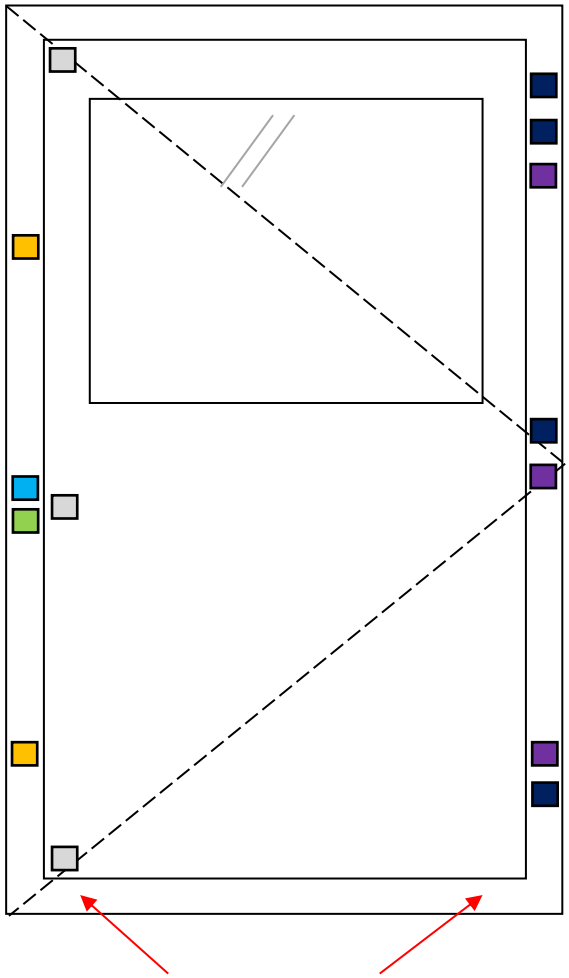
Smarts Traditional Designer Door with Fuhr Slam Lock Standard Threshold. Continued

Glazing Unit		**Glazing Gasket**	
Manufacturer:	Cornwall Glass	Gasket Type:	EDPM
Inner Thickness:	6.8mm Laminated Planitherm Total	Manufacturer:	Smart Systems
Spacer Material:	20 mm Warm Edge Spacer	Product Name:	Wedge Gasket
Outer Thickness:	8.8mm Laminated	Product Code	ACVG34
Unit Sizes:	682mm x 692mm x 62mm		
Glazing Tape Details		Manufacturer:	
Manufacturer:	NA	Product Name:	
Product Name:		Product Code	
Product Code			

Hardware			**Fixings**	**Quantity**
Hinges:	ACPD730	Tecnac	M6 Machine Screws	4
Hinge Protectors:	ACPD735	Smart Systems	ACET060	3
Lock:	ACPD690	Fuhr Slam Lock	ACET060	1
Cylinder:	ACCY3063TTS3	Era	M5 Machine Screw	1
Handle:	ACPD630	Blu Pull Handle	Supplied with handle	2
Touch Bar:	NA			
Cylinder Support:	NA			
Cylinder Escutcheon:	ACPD740	Era External Finger Pull	M5 Machine Screws	1
Keeps:		Supplied with lock	ACET060	1
Drip Bar	SPD706	Smart Systems	ACET099	1
Low Threshold End caps	ACPD704	Smart Systems		1 pair.
Drip End Caps	ACPD706	Smart Systems		1 pair.
Cam Lock For Glazed Mouldings	ACPD870	Tecnac	ACET060	12

Note – parts list supplied by client but not verified by BSI

Elevation Drawing Showing Position of Hardware.



Graph of Air Permeability Before Gusting. (Sample 1)

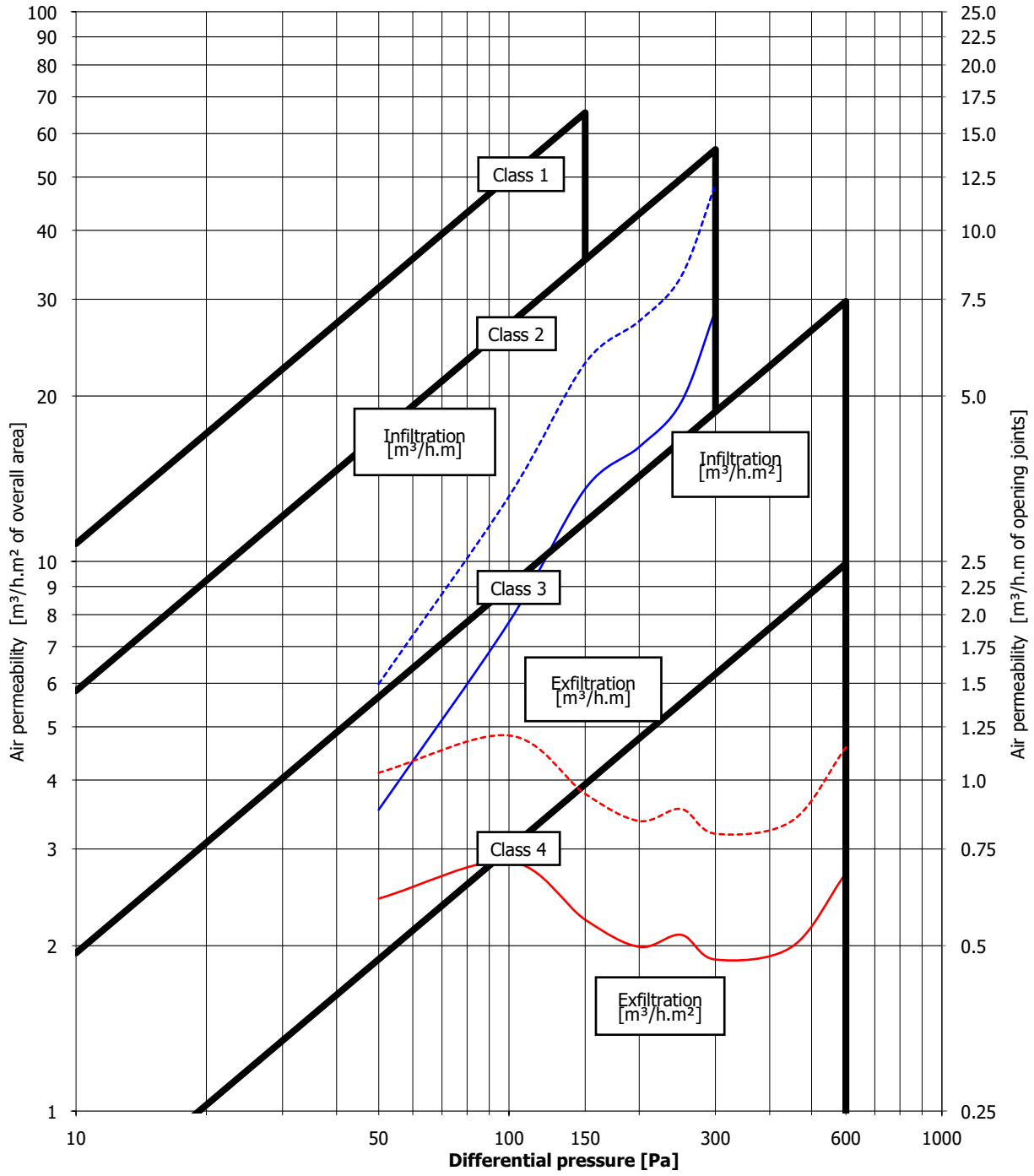


Table of Air Permeability Before Gusting. (Sample 1)

AIR PERMEABILITY TEST RESULTS - BS EN 1026:2000 / BS EN 12207:2000

Three positive pressure pulses of 660Pa were applied prior to testing

Air Pressure [Pa]	Blank reading [m³/h]	Maximum total air flow [m³/h]	Actual rate of air leakage [m³/h]	Rate of air leakage per meter length of opening joint [m³/h.m]	Rate of air leakage relative to area of sample [m³/h.m²]
50	9.3	19.6	10.2	1.50	3.53
100	15.0	37.6	22.3	3.28	7.75
150	20.3	59.8	39.0	5.74	13.55
200	24.3	71.4	46.5	6.84	16.16
250	28.4	85.2	56.1	8.25	19.48
300	31.0	114.5	82.5	12.13	28.64
-50	5.9	13.0	7.0	1.03	2.44
-100	9.4	17.7	8.2	1.21	2.85
-150	12.4	18.9	6.4	0.94	2.23
-200	14.5	20.3	5.7	0.84	1.99
-250	15.8	21.9	6.0	0.89	2.09
-300	18.1	23.6	5.4	0.80	1.89
-450	25.6	31.4	5.7	0.84	1.99
-600	31.8	39.7	7.8	1.15	2.71

Total opening perimeter = 6.8m

Overall area = 2.88m²

BS EN 12207:2000 - Joint class = 2

BS EN 12207:2000 - Area class = 2

BS EN 12207:2000 - Overall class before gusting = 2

Graph of Average Air Permeability Before Gusting. (Sample 1)

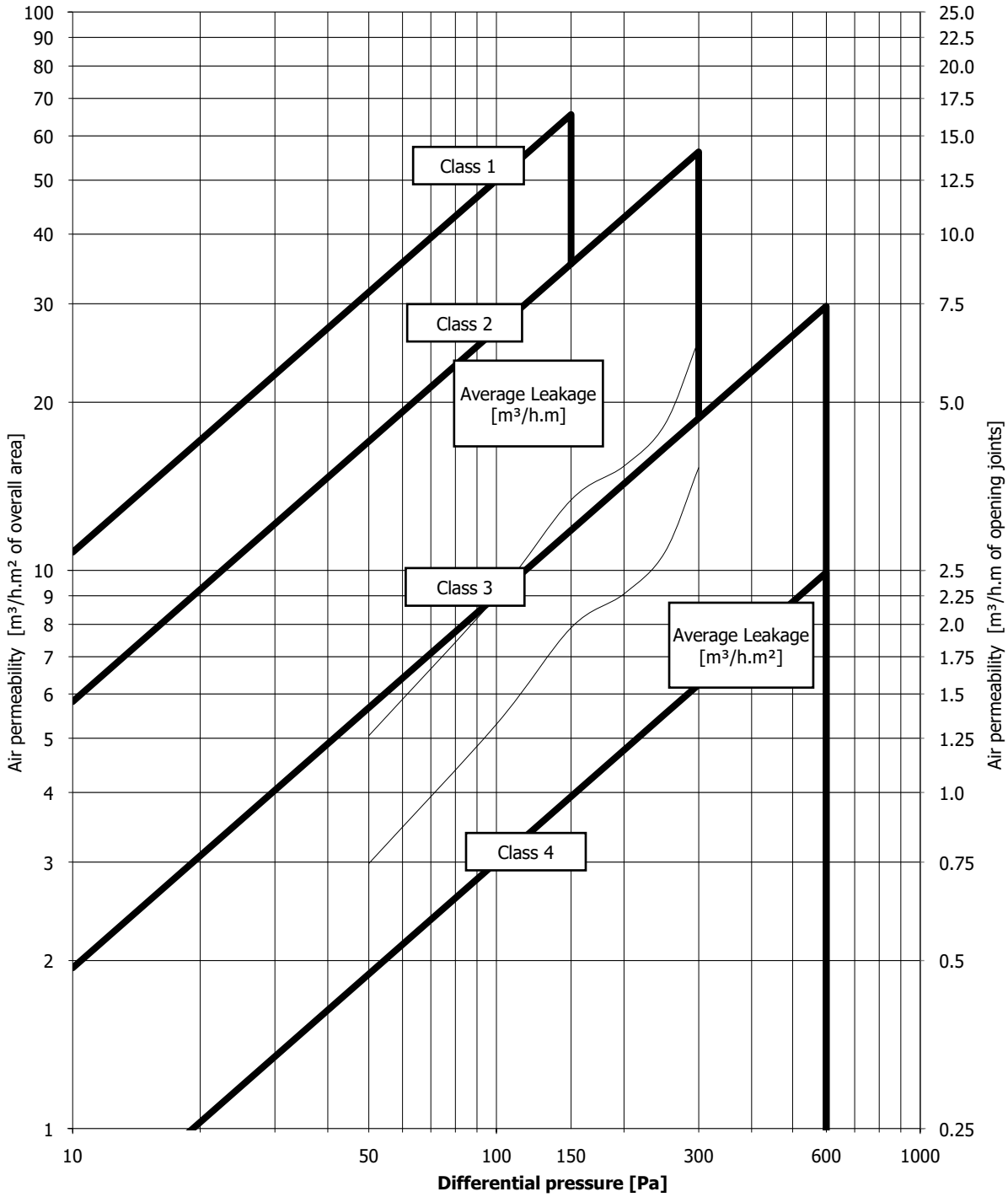


Table of Average Air Permeability Before Gusting. (Sample 1)

AIR PERMEABILITY TEST RESULTS - BS 6375-1:2015 / BS EN 1026:2000

Three positive pressure pulses of 660Pa were applied prior to testing

Air Pressure [Pa]	Average rate of air leakage [m³/h]	Average rate of air leakage per meter length of opening joint [m³/h.m]	Average rate of air leakage relative to area of sample [m³/h.m²]
50	8.6	1.26	2.98
100	15.3	2.24	5.30
150	22.7	3.34	7.89
200	26.1	3.84	9.07
250	31.1	4.57	10.79
300	44.0	6.46	15.26

Note: The figures in the table above give the leakage as an average of the leakage at positive pressure and the leakage at negative pressure

Total opening perimeter = 6.8m

Overall area = 2.88m²

BS 6375-1:2015 Clause 6.3 - Joint class = 2

BS 6375-1:2015 Clause 6.3 - Area class = 2

BS 6375-1:2015 Clause 6.3 - Overall class = 2

Watertightness Test Results. (Sample 1)

BS EN 1027:2000 Clause 7 watertightness before resistance to wind loads

TABLE 2 – Spraying method 1A

Pressure (Pa)	Point at which water leakage occurred
0	No leakage
50	No leakage
100	No leakage
150	Water leaked out and over the threshold at 3 minutes 19 seconds
200	-
250	-
300	-
450	-
600	-
750	-
900	-
1050	-

Wind Load Resistance Test Results.

Clause 8 Resistance to Wind Load

P1 Deflection Test

Three positive pulses of 1320Pa were applied.

No visible failures or functional defects of the test sample were observed after wind loads were applied at a positive air pressure of 1200Pa.

Actual deflection 6.26mm (maximum deflection allowed 7.50mm)

Deflection/span ratio 1/359 (maximum ratio allowed 1/300)

Three negative pulses of 1320Pa were applied.

No visible failures or functional defects of the test sample were observed after wind loads were applied at a negative air pressure of 1200Pa.

Actual deflection 4.44mm (maximum deflection allowed 7.50mm)

Deflection/span ratio 1/507 (maximum ratio allowed 1/300)

Wind Load Resistance Test Results. (continued)

Clause 8 Resistance to Wind Load (continued)

P2 Repeated Pressure Test

No visible failures or defects of the test sample were observed after 50 cycles of repeated wind loads were applied at a positive air pressure of 600Pa.

No visible failures or defects of the test sample were observed after 50 cycles of repeated wind loads were applied at a negative air pressure of 600Pa.

Graph of Air Permeability After Gusting. (Sample 1)

(including +20% lines for each class)

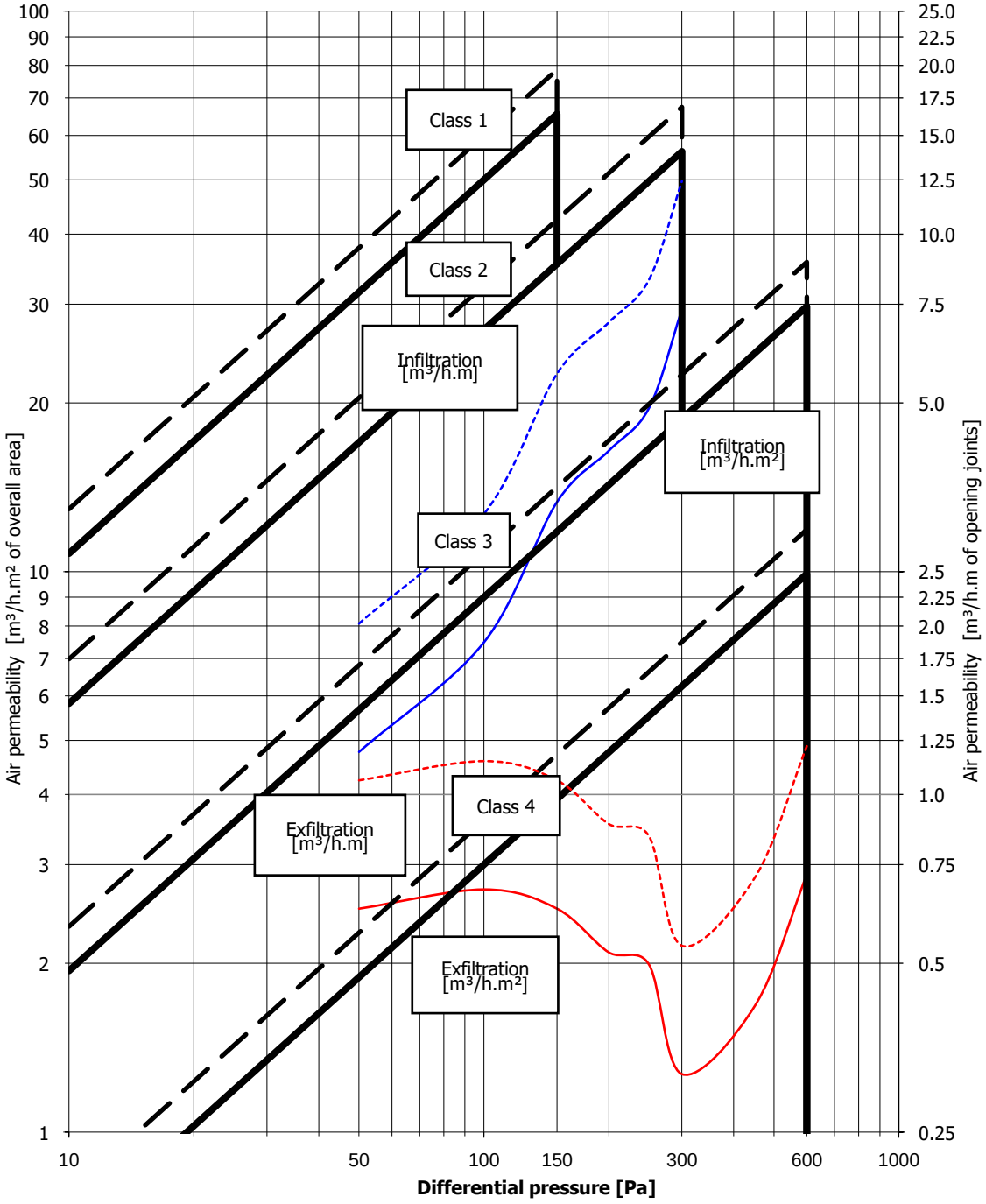


Table of Air Permeability After Gusting. (Sample 1)

AIR PERMEABILITY TEST RESULTS - BS EN 1026:2000 / BS EN 12207:2000

Three positive pressure pulses of 660Pa were applied prior to testing

Air Pressure [Pa]	Blank reading [m³/h]	Maximum total air flow [m³/h]	Actual rate of air leakage [m³/h]	Maximum rate of air leakage per meter length of opening joint [m³/h.m]	Maximum rate of air leakage relative to area of sample [m³/h.m²]
50	9.8	23.7	13.7	2.02	4.77
100	16.1	37.9	21.5	3.17	7.48
150	21.5	60.3	38.3	5.64	13.31
200	25.6	73.5	47.3	6.96	16.43
250	29.5	86.6	56.4	8.30	19.59
300	31.5	117.1	84.6	12.44	29.36
-50	6.8	14.1	7.2	1.06	2.50
-100	10.4	18.3	7.8	1.15	2.71
-150	12.8	20.1	7.2	1.06	2.50
-200	15.3	21.4	6.0	0.89	2.09
-250	17.9	23.7	5.7	0.84	1.99
-300	21.3	25.0	3.7	0.54	1.27
-450	27.6	32.5	4.8	0.71	1.68
-600	33.2	41.6	8.3	1.22	2.88

Total opening perimeter = 6.8m

Overall area = 2.88m²

Graph of Average Air Permeability After Gusting. (Sample 1)

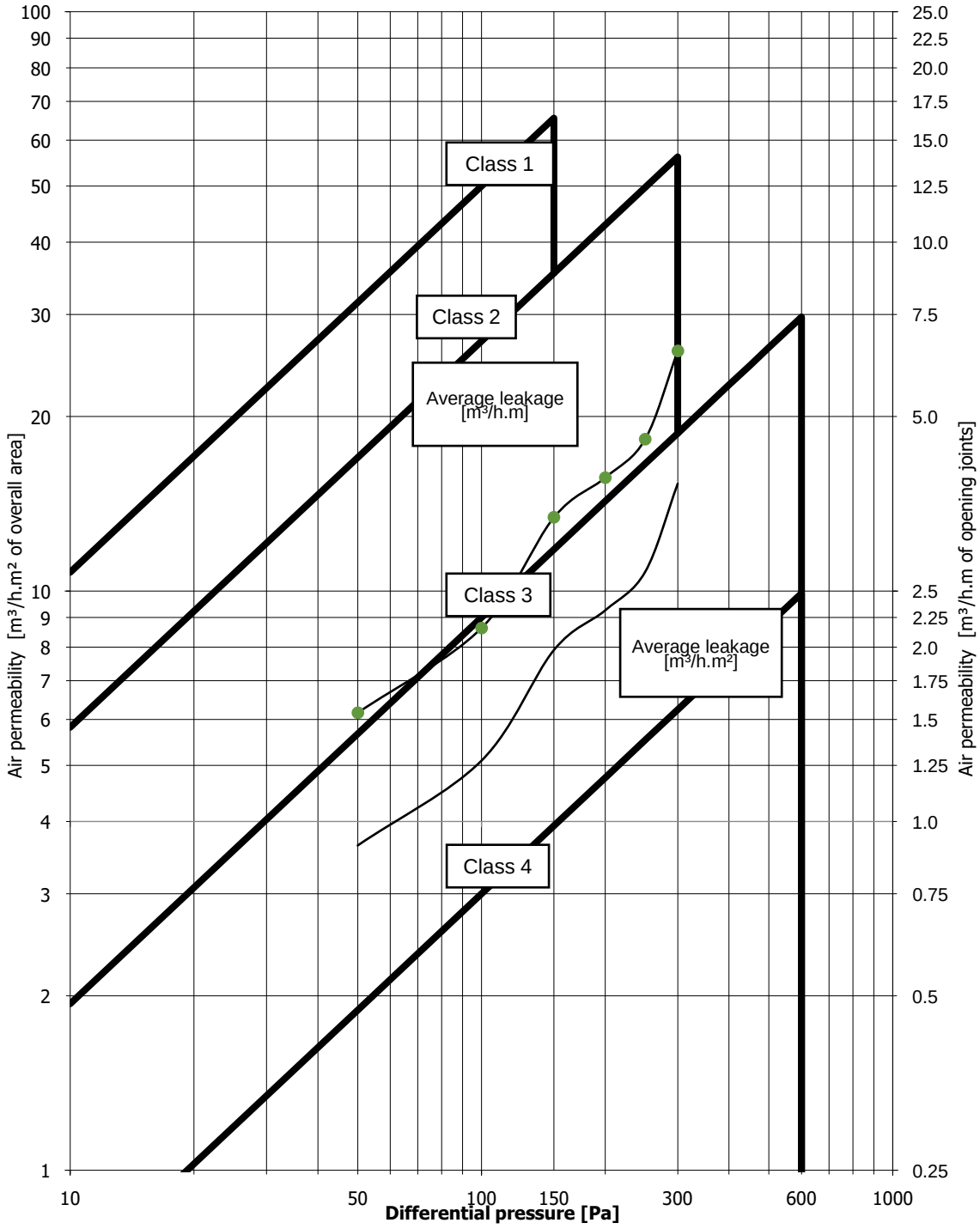


Table of Average Air Permeability After Gusting.

AIR PERMEABILITY TEST RESULTS - BS 6375-1:2015 / BS EN 1026:2000

Three positive pressure pulses of 660Pa were applied prior to testing

Air Pressure [Pa]	Average rate of air leakage [m³/h]	Average rate of air leakage per meter length of opening joint [m³/h.m]	Average rate of air leakage relative to area of sample [m³/h.m²]
50	10.5	1.54	3.64
100	14.7	2.16	5.09
150	22.8	3.35	7.91
200	26.7	3.92	9.26
250	31.1	4.57	10.79
300	44.1	6.49	15.32

Note: The figures in the table above give the leakage as an average of the leakage at positive pressure and the leakage at negative pressure

Total opening perimeter = 6.8m

Overall area = 2.88m²

BS 6375-1:2015 Clause 6.5 - Joint class = 2

BS 6375-1:2015 Clause 6.5 - Area class = 2

BS 6375-1:2015 Clause 6.5 - Overall class = 2

Wind Load Resistance Test Results. (continued)

Clause 8 Resistance to Wind Load (continued)

P3 Safety Test

No parts of the test sample became detached and the test sample remained closed after a wind load safety test was applied at a positive air pressure of 1800Pa.

No parts of the test sample became detached and the test sample remained closed after a wind load safety test was applied at a negative air pressure of 1800Pa.

BS 6375-2:2009. (Sample 1)

Clause 6.2 Operating Forces: EN12046-2:2000 and EN12217:2015 (Class 1) Assessment

The sample was tested three times – closing the leaf, lifting the handle, locking the key, unlocking the key, opening the handle and opening the leaf – and the average force recorded

Closing leaf force – 29.98N (maximum 75N) Pass

Handle closing – N/A

Key Torque to lock – < 1.00 Nm (maximum 5Nm) Pass

Key Torque to unlock – < 1.00 Nm (maximum 5Nm) Pass

Handle opening – N/A

Force to maintain opening – N/A

Clause 6.3.1 Vertical Load (Class 2)

All loads were applied and removed in maximum increments of 100N.

The diagonal measurement of the door was taken to the nearest 1mm (bottom hinge side corner to top lock side corner).

A pre-load of 200 ± 4N was applied vertically to the top corner of the lock side of the door leaf, at 50 ± 5mm from the opening edge and maintained for 60 ± 5 seconds. The load was then removed, and the sample left to rest for 60 ± 5 seconds.

The gauge was zeroed before a 600N load (Class 2) was applied to the same loading point for 300 ± 5 seconds, and the maximum deformation was measured.

The load was removed and after 180 ± 5 seconds the residual deflection and diagonal measurements were taken.

Initial diagonal measurement – 2590mm

Maximum deformation – 1.20 mm

Residual deformation – 0.43 mm

Final diagonal measurement – 2590mm

For the door to pass the residual deformation must not exceed 1.0mm Pass

Clause 6.3.2 Resistance to Static Torsion (Class 2) Assessment

All loads were applied and removed in maximum increments of 100N.

The door leaf was opened to 90° then fixed at the top lock side corner, 50 ± 5mm from the edge.

A pre-load of 200 ± 4N was applied horizontally and normally to the plane of the leaf at the lower lock side corner, 50 ± 5mm from the edge and maintained for 60 ± 5 seconds.

After one minute the gauge was zeroed and a load of 250N (Class 2) was applied for 300 ± 5 seconds before the maximum deformation was measured. The load was then removed, and the sample left to rest for 180 ± 5 seconds before the residual deformation was measured.

Maximum deformation – 22.00mm

Residual deformation – 1.50mm

For the door to pass the residual deformation must not exceed 2.0mm Pass

Clause 6.3.3 Soft and Heavy Body Impact (Class 2)

The door was closed to its normal operating mode and the sample was marked at the centre of the door leaf.

The deviation across the width of the door was measured at the impact point.

A 30±0.6kg leather impactor was raised to the required drop height and impacted three times to each face, and the deviation was measured again.

For the door to achieve the required class it shall not exceed 2mm residual measurement.

Residual measurement – 0.13mm Pass

Clause 6.3.4 Hard Body Impact (Class 2)

The door leaf was mounted horizontally with rigid supports under the long edges of the leaf and pattern 2 was selected. Glazed impact points were omitted, and the exterior face was impacted.

If permanent damage is left after impact, measurements are taken after 30 minutes.

Mean of the diameter – 4.00mm

Mean of the depth – 0.10mm

The mean to qualify for a class shall not exceed 20mm, and the mean for the depth shall not exceed 1.0mm. Pass

BS 6375-2:2009.

Closure Against Obstruction — Assessment

The objective of this test is to determine the resistance of a doorset to closure of the door leaf against small objects such as toys which may be accidentally trapped between the leaf and the frame.

A 50 x 50 x 10mm aluminium block was placed in the gap between the leaf and the bottom of the hinge side jamb.

A 200N force was applied to the lock side of the leaf and held for 15 ± 5 seconds.

The leaf was then opened and closed five time and the operating forces were repeated.

Clause 6.2 Operating Forces: EN12046-2:2000 and EN12217:2015 (Class 1)

The sample was tested three times – closing the leaf, lifting the handle, locking the key, unlocking the key, opening the handle and opening the leaf – and the average force recorded.

Closing leaf force – 35.45N (maximum 75N) Pass

Handle closing – N/A

Key Torque to lock – <1.00Nm (maximum 5Nm) Pass

Key Torque to unlock – <1.00Nm (maximum 5Nm) Pass

Handle opening – N/A

Force to maintain N/A

Basic Security (Annex A).

BS 6375-3:2009

The objective of this test is to establish if, from the outside, entry can be gained by defeating the glazing or locking system.

The force used did not result in permanent set or plastic deformation of any tool.

Damaged tools shall be replaced. The test did not exceed the maximum three-minute time period.

The screwdriver was used to no effect.

No entry gained within three minutes. Pass

BS EN 1191:2000. (Traditional door with Fuhr locking)

Clause 5.5 Repeated Opening and Closing Assessment

Operated for 50,000 cycles - main mode, master leaf

The sample was opened and closed five times before testing was started.

Rotation of key to unlock - 360°

Clause 6.2 Operating Forces: EN12046-2:2000 and EN12217:2015 (pre-test operation)

The sample was tested three times – closing the leaf, lifting the handle, locking the key, unlocking the key, opening the handle and opening the leaf – and the average force recorded.

Closing leaf force – 58.35N (maximum 75N)	Pass
Handle closing – N/A (maximum 100N)	Pass
Key force to lock – <1.00Nm (maximum 5Nm)	Pass
Key force to unlock – <1.00Nm (maximum 5Nm)	Pass
Handle opening – N/A (maximum 100N)	Pass
Force to maintain opening – 51.01 (maximum 75N)	Pass

After 50,000 cycles the operating forces were recorded again

Closing leaf force – 59.86 (maximum 75N)	Pass
Handle closing – N/A (maximum 100N)	Pass
Key force to lock – <1.00Nm (maximum 5Nm)	Pass
Key force to unlock – <1.00Nm (maximum 5Nm)	Pass
Handle opening – N/A (maximum 100N)	Pass
Force to maintain opening – 52.80 (maximum 75N)	Pass

The sample met the requirements of the standard and remained within operating forces for 50,000 cycles

BS6375-1:2015 - Part 1 Only Direct Test. (Sample 2)

1 off single leaf open in cassette glazed doorset with a low threshold

(Sample ID No. 10184008)

Date sample received: 23 September 2019

Test Results.

1.	Air Permeability	Test sample 2 met the requirements of the Specification, in respect of Clause 6, for Test Pressure Class 2.
2.	Watertightness	Test sample 2 met the requirements of the Specification, in respect of Clause 7, for Test Pressure Class 2a.
3.	Wind Resistance	Test sample 2 met the requirements of the Specification, in respect of BS6375-2:2009, for Exposure Category C3 (1200 Pa).

Classifications for Operational Strength.

Operating forces	Class 1

Description of Sample 2. (Traditional low threshold)

Sample Type -	Single leaf open in cassette glazed doorset with a low threshold		
Material -	Aluminium		
Construction -	Mechanically jointed		
Fittings -	A three-point FUHR (two hook/pins and one dead bolt) locking system, key lockable 3*ERA cylinder, three dog bolts and four lift off hinges		
Glass -	Triple glazed 6.8-20-6.4-20-8.8mm laminated unit		
Panel -	Not applicable		
Glass Retention System -	Cassette glazing		
Weathersealing -	Double-sealed plastic weather strip		
Sample dimensions -	Overall length: Active leaf length:	1200mm 1070mm	Height: 2400mm Height: 2330mm
Date of test -	25 September 2019		
Laboratory temperature -	17.6°C		
Laboratory humidity -	68.0%RH		
Atmospheric pressure -	99.9kPa		
Test engineers -	David Vinyard		

Smarts Traditional Designer Door with Fuhr Slam Lock Low Threshold.

Outer Frame width	1200mm	**Outer Frame Material**	Aluminium
Outer Frame height	2400mm	**Outer Frame Gasket**	
Outer Frame Part Numbers		Gasket Type	EDPM
Top	SPD702	Manufacturer	Reddiplex
Bottom	SPD703	Product Name	Flipper Gasket, Central Gasket. Threshold Gasket
Lock Side	SPD702	Product Code	ACET160R, ACPD725 ACET232
Hinge Side	SPD702	**Threshold**	
Outer Frame section dimensions		Manufacturer	Smart Systems
Width	70mm	Product name	Low Threshold
Depth	62mm	Product Code	SPD703
Reinforcing:		Materials	Aluminium
Manufacturer	NA	**Outer Frame Joint Method**	
Product Name		Head	Corner Cleat
Product code		Foot	T Joint Cleat
Material			

Leaf		**Leaf Material:**	Aluminium
Leaf Width:	1126mm	**Leaf Gasket**	
Leaf Height:	2352mm	Gasket type:	EDPM
Leaf Part Numbers:		Manufacturer:	Trelleborg
Top:	SPD705	Product Name:	Flipper Gasket
Bottom:	SPD705	Product Code	ACPD724
Lock side:	SPD705	**Leaf Panel Slab**	
Hinge Side	SPD705	Manufacturer:	Smart Systems
Leaf section size		Product name:	Leaf Panel Slab
Width:	129mm	Product code:	ACPD 131
Depth:	70mm	Material:	Aluminium
Panel Moulding		**Leaf joint method**	
Manufacturer:	Smart Systems	Head:	Cleat, Glue and Tension Block
Product Name:	Moulding	Foot:	Cleat, Glue And Tension Block
Product Code:	SPD760 , SPD761		
Material:	Aluminium		
Drip Section			
Manufacturer:	Smart Systems		
Product Name:	Drip		
Product Code:	SPD706		
Material:	Aluminium		
Drip Size:	30.5mm x 34.5mm		

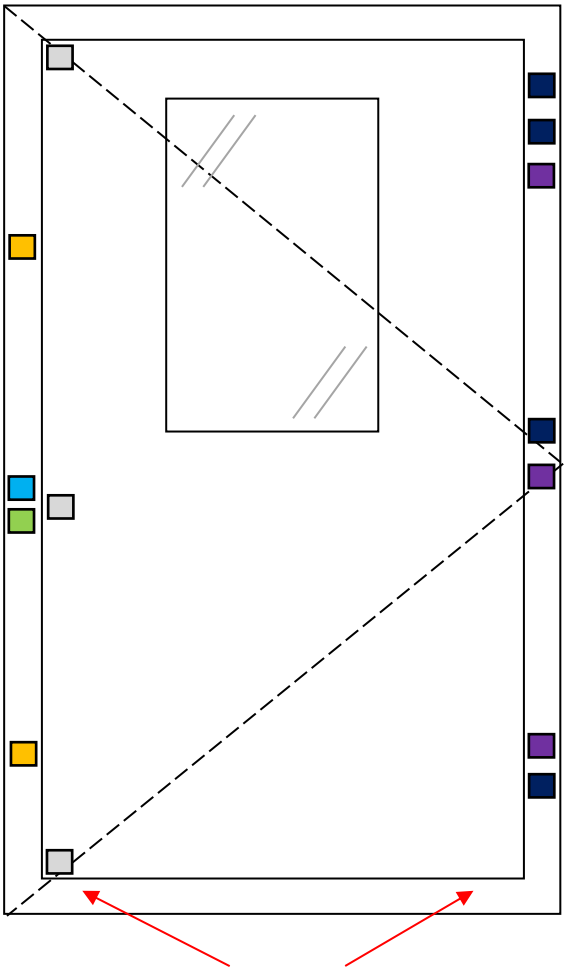
Smarts Traditional Designer Door with Fuhr Slam Lock Low Threshold. Continued

Glazing Unit		**Glazing Gasket**	
Manufacturer:	Cornwall Glass	Gasket Type:	EDPM
Inner Thickness:	6.8mm Laminated Planitherm Total	Manufacturer:	Smart Systems
Spacer Material:	20 mm Warm Edge Spacer	Product Name:	Wedge Gasket
Outer Thickness:	8.8mm Laminated	Product Code	ACVG34
Unit Sizes:	682mm x 692mm x 62mm		
Glazing Tape Details		Manufacturer:	
Manufacturer:	NA	Product Name:	
Product Name:		Product Code	
Product Code			

Hardware			**Fixings**	**Quantity**
Hinges:	ACPD730	Tecnac	M6 Machine Screws	4
Hinge Protectors:	ACPD735	Smart Systems	ACET060	3
Lock:	ACPD690	Fuhr Slam Lock lock	ACET060	1
Cylinder:	ACCY3063TTS3	Era	M5 Machine Screw	1
Handle:	ACPD630	Blu Pull Handle	Supplied with handle	2
Touch Bar:	NA			
Cylinder Support:	NA			
Cylinder Escutcheon:	ACPD740	Era External Finger Pull	M5 Machine Screws	1
Keeps:		Supplied with lock	ACET060	1
Drip Bar	SPD706	Smart Systems	ACET099	1
Low Threshold End caps	ACPD704	Smart Systems		1 pair.
Drip End Caps	ACPD706	Smart Systems		1 pair.
Cam Lock For Glazed Mouldings	ACPD870	Tecnac	ACET060	12
Low Threshold Woolpile	ACSR011			

Note – parts list supplied by client but not verified by BSI

Elevation Drawing Showing Position of Hardware.



water leakage points

Handle:
Hinge:
Dog Bolt:
Hook/Pin:
Dead Bolt:
Transducer placement:

Graph of Air Permeability Before Gusting. (Sample 2)

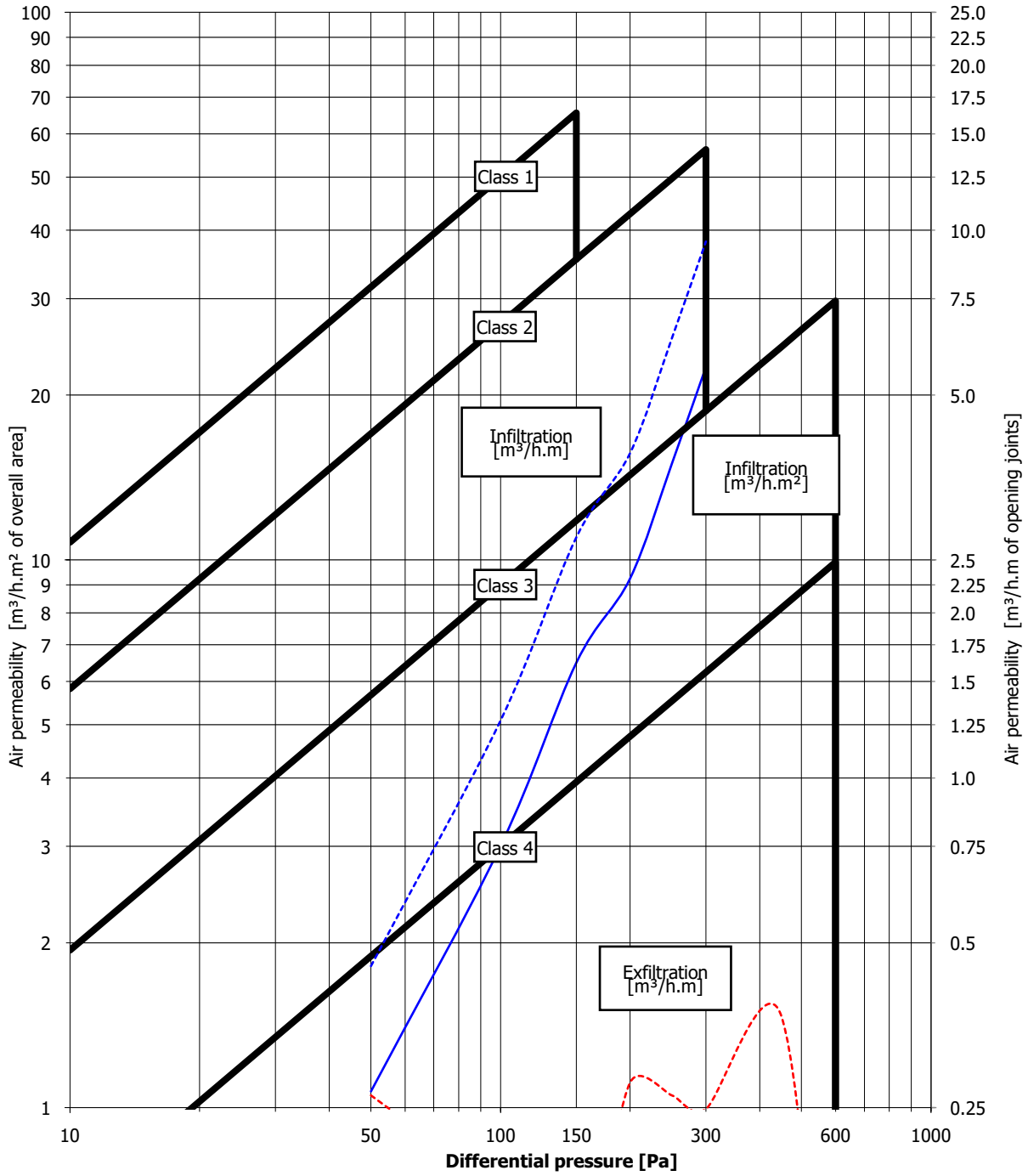


Table of Air Permeability Before Gusting. (Sample 2)

AIR PERMEABILITY TEST RESULTS - BS EN 1026:2000 / BS EN 12207:2000

Three positive pressure pulses of 660Pa were applied prior to testing

Air Pressure [Pa]	Blank reading [m³/h]	Maximum total air flow [m³/h]	Actual rate of air leakage [m³/h]	Rate of air leakage per meter length of opening joint [m³/h.m]	Rate of air leakage relative to area of sample [m³/h.m²]
50	9.2	12.3	3.1	0.45	1.07
100	15.0	23.7	8.7	1.27	3.00
150	18.7	37.5	18.7	2.75	6.49
200	22.8	49.6	26.6	3.92	9.25
250	26.7	70.1	43.2	6.35	14.98
300	29.4	94.6	64.8	9.53	22.51
-50	5.9	7.7	1.8	0.26	0.62
-100	9.8	11.0	1.2	0.18	0.41
-150	13.4	14.2	0.8	0.12	0.28
-200	15.4	17.3	1.9	0.28	0.66
-250	18.1	19.9	1.8	0.26	0.62
-300	21.1	22.8	1.7	0.25	0.59
-450	27.9	30.4	2.5	0.37	0.86
-600	37.6	37.9	0.3	0.04	0.10

Total opening perimeter = 6.8m

Overall area = 2.88m²

BS EN 12207:2000 - Joint class = 2

BS EN 12207:2000 - Area class = 2

BS EN 12207:2000 - Overall class before gusting = 2

Graph of Average Air Permeability Before Gusting. (Sample 2)

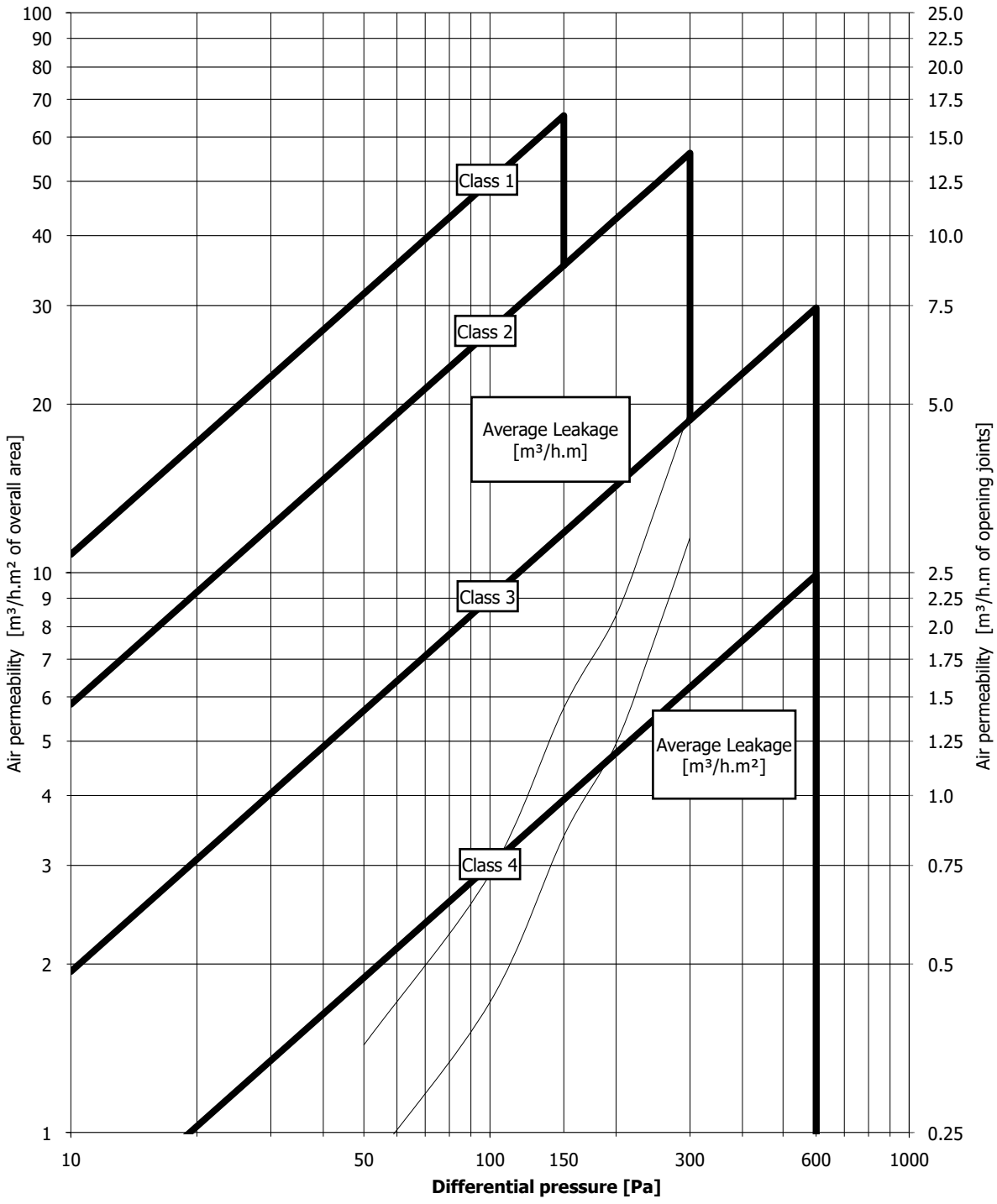


Table of Average Air Permeability Before Gusting. (Sample 2)

AIR PERMEABILITY TEST RESULTS - BS 6375-1:2015 / BS EN 1026:2000

Three positive pressure pulses of 660Pa were applied prior to testing

Air Pressure [Pa]	Average rate of air leakage [m³/h]	Average rate of air leakage per meter length of opening joint [m³/h.m]	Average rate of air leakage relative to area of sample [m³/h.m²]
50	2.4	0.36	0.85
100	4.9	0.72	1.71
150	9.7	1.43	3.38
200	14.3	2.10	4.95
250	22.5	3.30	7.80
300	33.3	4.89	11.55

Note: The figures in the table above give the leakage as an average of the leakage at positive pressure and the leakage at negative pressure

Total opening perimeter = 6.8m

Overall area = 2.88m²

BS 6375-1:2015 Clause 6.3 - Joint class = 2

BS 6375-1:2015 Clause 6.3 - Area class = 2

BS 6375-1:2015 Clause 6.3 - Overall class = 2

Watertightness Test Results. (Sample 2)

BS EN 1027:2000 Clause 7 watertightness before resistance to wind loads

TABLE 2 – Spraying method 1A

Pressure (Pa)	Point at which water leakage occurred
0	No leakage
50	No leakage
100	Water leaked out and over the threshold at 12 seconds
150	-
200	-
250	-
300	-
450	-
600	-
750	-
900	-
1050	-

Wind Load Resistance Test Results.

Clause 8 Resistance to Wind Load

P1 Deflection Test

Three positive pulses of 1320Pa were applied.

No visible failures or functional defects of the test sample were observed after wind loads were applied at a positive air pressure of 1200Pa.

Actual deflection 1.74mm (maximum deflection allowed 7.50mm)

Deflection/span ratio 1/1293 (maximum ratio allowed 1/300)

Three negative pulses of 1320Pa were applied.

No visible failures or functional defects of the test sample were observed after wind loads were applied at a negative air pressure of 1200Pa.

Actual deflection 2.61mm (maximum deflection allowed 7.50mm)

Deflection/span ratio 1/862 (maximum ratio allowed 1/300)

Wind Load Resistance Test Results. (continued)

Clause 8 Resistance to Wind Load (continued)

P2 Repeated Pressure Test

No visible failures or defects of the test sample were observed after 50 cycles of repeated wind loads were applied at a positive air pressure of 600Pa.

No visible failures or defects of the test sample were observed after 50 cycles of repeated wind loads were applied at a negative air pressure of 600Pa.

Graph of Air Permeability After Gusting. (Sample 2)

(including +20% lines for each class)

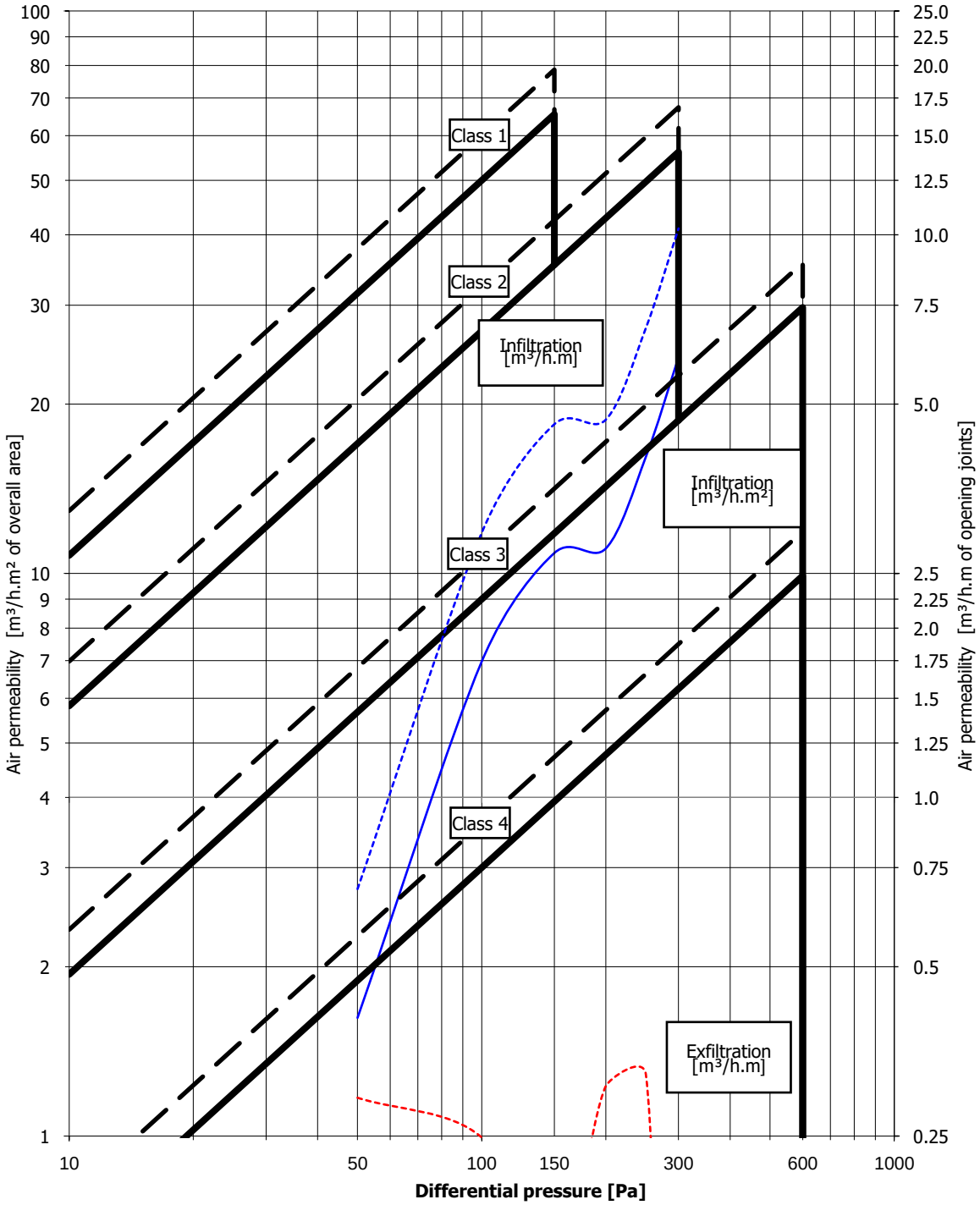


Table of Air Permeability After Gusting. (Sample 2)

AIR PERMEABILITY TEST RESULTS - BS EN 1026:2000 / BS EN 12207:2000

Three positive pressure pulses of 660Pa were applied prior to testing

Air Pressure [Pa]	Blank reading [m³/h]	Maximum total air flow [m³/h]	Actual rate of air leakage [m³/h]	Maximum rate of air leakage per meter length of opening joint [m³/h.m]	Maximum rate of air leakage relative to area of sample [m³/h.m²]
50	9.6	12.8	3.2	0.47	1.10
100	14.9	34.5	19.5	2.87	6.77
150	18.6	44.5	25.8	3.79	8.94
200	22.5	50.1	27.4	4.04	9.53
250	26.3	70.4	43.8	6.45	15.23
300	29.6	98.6	68.6	10.09	23.82
-50	6.1	8.1	2.0	0.29	0.69
-100	10.2	11.9	1.7	0.25	0.59
-150	14.1	15.1	1.0	0.15	0.35
-200	16.5	18.6	2.1	0.31	0.73
-250	18.9	21.1	2.2	0.32	0.76
-300	23.6	23.8	0.2	0.03	0.07
-450	31.7	32.4	0.7	0.10	0.24
-600	39.4	40.3	0.9	0.13	0.31

Total opening perimeter = 6.8m

Overall area = 2.88m²

Graph of Average Air Permeability After Gusting. (Sample 2)

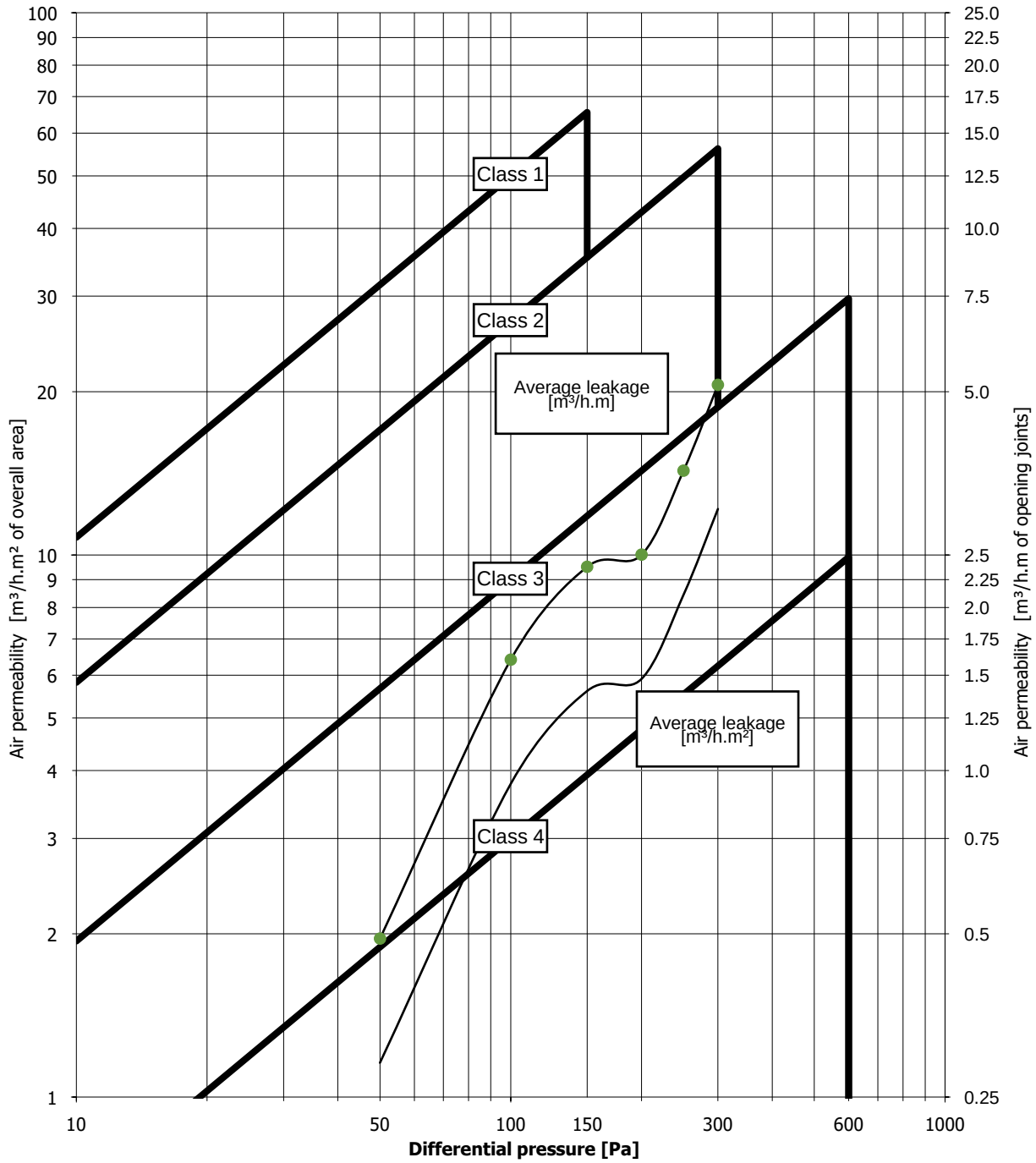


Table of Average Air Permeability After Gusting. (Sample 2)

AIR PERMEABILITY TEST RESULTS - BS 6375-1:2015 / BS EN 1026:2000

Three positive pressure pulses of 660Pa were applied prior to testing

Air Pressure [Pa]	Average rate of air leakage [m³/h]	Average rate of air leakage per meter length of opening joint [m³/h.m]	Average rate of air leakage relative to area of sample [m³/h.m²]
50	2.6	0.38	0.90
100	10.6	1.56	3.68
150	13.4	1.97	4.64
200	14.8	2.17	5.13
250	23.0	3.39	7.99
300	34.4	5.06	11.95

Note: The figures in the table above give the leakage as an average of the leakage at positive pressure and the leakage at negative pressure

Total opening perimeter = 6.8m

Overall area = 2.88m²

BS 6375-1:2015 Clause 6.5 - Joint class = 2

BS 6375-1:2015 Clause 6.5 - Area class = 2

BS 6375-1:2015 Clause 6.5 - Overall class = 2

PAS24:2016 Type Test. (Sample 2)

1 off single leaf open in cassette glazed doorset with a low threshold

(Sample ID No 10184008)

Date sample received: 23 September 2019

Test Results.

1.	Manipulation	The test sample met the requirements of the Specification in respect of B.4.3
2.	Infill Removal	The test sample met the requirements of the Specification in respect of B.4.4
3.	Mechanical Loading	The test sample met the requirements of the Specification in respect of B.4.5
4.	Soft Body Impact	The test sample met the requirements of the Specification in respect of B.4.8
5.	Hard Body Impact	The test sample met the requirements of the Specification in respect of B.4.9.2.2
6.	Security Hardware and Cylinder Test	The test sample met the requirements of the Specification in respect of Annex A
7.	Manual Check Test	The test sample met the requirements of the Specification in respect of B.4.6

B.2 Sample Selection.

The sample submitted for tests was selected using the criteria in B.2 of the Specification.
The sample was submitted for test mounted in a 75mm x 100mm timber subframe in accordance with the manufacturer's
installation requirements. The test sample was manufactured by the client.

The results within this test report are valid only for the conditions under which the testing was carried out, and only for the specified products.

B.3 Requirements for Test Apparatus.

The test apparatus for the manual and mechanical tests is shown in figures B.2 to B.5.

B.4 Test Methods.

The method of testing the sample followed the sequence detailed in B.4 of the Specification.

Description of Sample. (Sample 2 - traditional low threshold)

Sample Type -	Single leaf open in cassette glazed doorset with a low threshold		
Material -	Aluminium		
Construction -	Mechanically jointed		
Fittings -	A three-point FUHR (two hook/pins and one dead bolt) locking system, key lockable 3*ERA cylinder, three dog bolts and four lift off hinges		
Classification -	D		
Glass -	Triple glazed 6.8-20-6.4-20-8.8mm laminated unit		
Panel -	Not applicable		
Glass Retention System -	Cassette glazing		
Sample dimensions -	Overall length: Active leaf length:	1200mm 1070mm	Height: 2400mm Height: 2330mm

Test Results.

Performance Requirements	Assessment

B.4.3 Manipulation Test A

The sample was mounted vertically in the test rig as described in Clause 3.

The test was carried out in accordance with the given objectives of this Clause using the tools specified in A.2.1

The sample was closed and locked and the key removed. Although there is a 15 minute overall time limit no one technique was used for more than three minutes.

No tools or techniques were effective.

No entry gained within the time allowed. Pass

Date of test – 10 October 2019
Test engineer(s) – E Creary & D Vinyard
Laboratory temperature – 19.9°C

B.4.4 Cutting and Infill Medium Removal Test

B.4.4.2 Infill Manual Test

The sample was mounted, vertically and square, in the test rig as described in B.3.1.

The test was carried out in accordance with the requirements of this Annex using the tools described in Group A and Group B where applicable.

A craft knife was used to attempt to remove the cassette.

No entry gained within three minutes. Pass

Date of test – 10 October 2019
Test engineer(s) – E Creary & D Vinyard
Laboratory temperature – 19.9°C

Test Results (continued).

Performance Requirements (continued) Assessment

B.4.4.3 Infill Mechanical Test

The sample was mounted, vertically and square, in the test rig as described in B.3.1.

The test was carried out with a perpendicular-to-plane load of 2.0kN applied to each corner of the glazing cassette.

No evidence of failure. No entry gained. Pass

Date of test – 10 October 2019
Test engineer(s) – E Creary & D Vinyard
Laboratory temperature – 19.9°C

B.4.4.4 Manual Cutting Test

The sample was mounted, vertically and square, in the test rig as described in B.3.1.

The test was carried out in accordance with the requirements of this Clause using the tools described.

A craft knife and 25mm chisel were used to attack the portion of the panel within Zone 1, the horizontal band with an upper limit of 400mm above the centre of rotation of the hardware unlocking point and a lower limit of 400mm below the centre of rotation of the hardware unlocking point, for three minutes.

The same tools were then used to attack the portion of the panel which falls outside of Zone 1 (Zone 2) for a further three minutes.

Craft knife and chisel used to attack the skin of the door leaf.

No entry gained within the time allowed. Pass

Date of test – 10 October 2019
Test engineer(s) – E Creary & D Vinyard
Laboratory temperature – 19.9°C

Test Results (Continued).

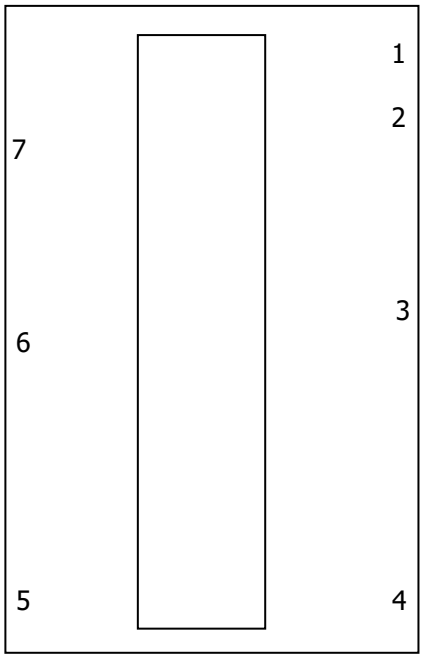
Performance Requirements (Continued).

B.4.5 Mechanical Loading Test

The sample was mounted, vertically and square, in the test rig.

The test was carried out in accordance with the procedures detailed in B.4.5, using loading cases B.1 to B.6 and Figures B.12 for loading sequence and using the test apparatus detailed in Figures B.6 to B.6.

Diagram of load points



B.4.5.2 Loading Procedure

First Sequence

1. Hinge (upper right jamb)

   Standard loading case used: 2

   Load applied in plane: 1.5kN along the edge in the direction to disengage the hinge
   Load applied perpendicular to plane: 4.5kN applied for ten seconds

   Load applied in plane: 1.5kN at right angles to the edge and towards the opposite edge
   Load applied perpendicular to plane: 4.5kN applied for ten seconds

Test Results (Continued).

B.4.5.2 Loading Procedure (continued)

First Sequence (continued)

2. Hinge / Dog Bolt (upper right jamb)

   Standard loading case used: 2 / 5

   Load applied in plane: 1.5kN along the edge in the direction to disengage the hinge
   Load applied perpendicular to plane: 4.5kN applied for ten seconds

   Load applied in plane: 1.5kN at right angles to the edge and towards the opposite edge
   Load applied perpendicular to plane: 4.5kN applied for ten seconds

3. Hinge / Dog Bolt (centre right jamb)

   Standard loading case used: 2 / 5

   Load applied in plane: 1.5kN along the edge in the direction to disengage the hinge
   Load applied perpendicular to plane: 4.5kN applied for ten seconds

   Load applied in plane: 1.5kN at right angles to the edge and towards the opposite edge
   Load applied perpendicular to plane: 4.5kN applied for ten seconds

4. Hinge / Dog Bolt (lower right jamb)

   Standard loading case used: 2 / 5

   Load applied in plane: 1.5kN along the edge in the direction to disengage the hinge
   Load applied perpendicular to plane: 4.5kN applied for ten seconds

   Load applied in plane: 1.5kN at right angles to the edge and towards the opposite edge
   Load applied perpendicular to plane: 4.5kN applied for ten seconds

5. Hook/Pin (lower left jamb)

   Standard loading case used: 4

   Load applied in plane: 1.5kN along the edge in the direction to disengage the hook bolt
   Load applied perpendicular to plane: 4.5kN applied for ten seconds

   Load applied in plane: 1.5kN at right angles to the edge and towards the opposite edge
   Load applied perpendicular to plane: 4.5kN applied for ten seconds

Test Results (Continued).

B.4.5.2 Loading Procedure (continued) Assessment

First Sequence (continued)

6. Dead Bolt (centre left jamb)

   Standard loading case used: 3

   Load applied in plane: 1.5kN at right angles to the edge and towards the opposite edge
   Load applied perpendicular to plane: 4.5kN applied for ten seconds

7. Hook/Pin (upper left jamb)

   Standard loading case used: 4

   Load applied in plane: 1.5kN along the edge in the direction to disengage the hook bolt
   Load applied perpendicular to plane: 4.5kN applied for ten seconds

   Load applied in plane: 1.5kN at right angles to the edge and towards the opposite edge
   Load applied perpendicular to plane: 4.5kN applied for ten seconds

   No entry gained Pass

Date of test – 8 October 2019
Test engineer(s) – E Creary & D Vinyard
Laboratory temperature – 19.9°C

B.4.3 Manipulation Test B

No fixings were exposed during mechanical loading. Pass

Date of test – 8 October 2019
Test engineer(s) – E Creary & D Vinyard
Laboratory temperature – 19.9°C

Test Results (Continued).

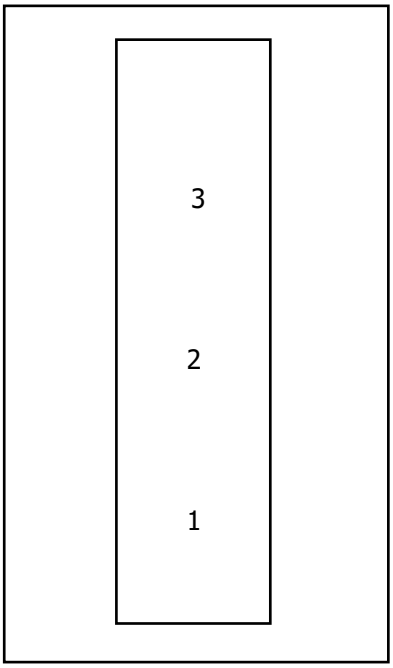
Assessment

B.4.8 Soft Body Impact Test

The sample was mounted, vertically and square, in the test rig as described in B.3.1

The test was carried out in accordance with the requirements, objectives and procedures detailed in B.4.8.1 using the impact points and procedure described in B.4.8.2 and B.4.8.3 and Figure B.10.

Diagram of impact points



Impact Point	Height from Floor Level	Effect
1	0.8m	None
2	1.25m	None
3	1.7m	None

No entry gained

Pass

Date of test – 8 October 2019
Test engineer(s) – E Creary & D Vinyard
Laboratory temperature – 19.9°C

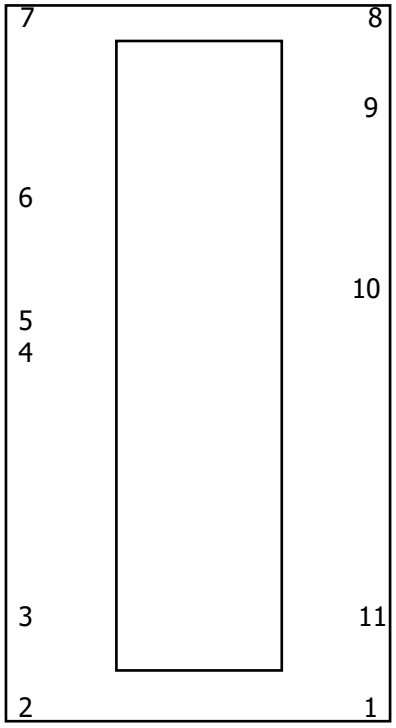
Test Results (Continued).

B.4.9 Hard Body Impact Test

The sample was mounted, vertically and square, in the test rig as described in B.3.1.

The test was carried out in accordance with the requirements, objectives and procedures detailed in B.4.9.1, B.4.9.2.1, B.4.9.2.2 and B.4.9.2.3 using procedure B.4.9.3, using the test apparatus detailed in B.11 and using the impact sequence in figure B.14.

Diagram of impact points



Test Results (Continued).

Performance Requirements (Continued).

Clause B.4.9 Hard Body Impact Test (continued) Assessment

Impact Point	Position	Effect
1	Corner	None
2	Corner	None
3	Hook/Pin	None
4	Cylinder	None
5	Dead	None
6	Hook/Pin	None
7	Corner	None
8	Corner/Hinge	None
9	Hinge/Dog Bolt	None
10	Hinge/Dog Bolt	None
11	Hinge/Dog Bolt	None

No entry gained Pass

Date of test – 8 October 2019
Test engineer(s) – E Creary & D Vinyard
Laboratory temperature – 19.9°C

Test Results (Continued).

Performance Requirements (continued)

B.4.6 Manual Check Test

The sample was mounted, vertically and square, in the test rig as described in B.3.1.

The test was carried out in accordance with the given objectives of this clause using the procedure detailed in B.4.6.3 and the tools described in B.4.6.2.

No one technique was used for more than 3 minutes.

No alternative method of entry could be found.

Date of test – 8 October 2019
Test engineer(s) – E Creary & D Vinyard
Laboratory temperature – 19.9°C

B.4.7 Additional Mechanical Loading Test

Not applicable

B.4.3 Letter Plates

None fitted

Test Results (Continued).

Performance Requirements (Continued).

Annex A Security Hardware and Cylinder Test Assessment

Annex A.3.2 (Part 1)

The sample was mounted, vertically and square, in the test rig as described in Clause 3.1.

The test was carried out in accordance with the given objectives of this Annex using the procedure detailed in Annex A.3.1 and the tools described in A.2.

Unable to remove the escutcheon plate.

No entry gained within three minutes. Pass

Date of test – 8 October 2019
Test engineer(s) – E Creary & D Vinyard
Laboratory temperature – 19.9°C

Annex A.3.2 (Part 2)

The sample was mounted, vertically and square, in the test rig as described in Clause 3.1.

The test was carried out in accordance with the given objectives of this Annex using the procedure detailed in Annex A.3.1 and the tools described in A.2.

Unable to insert the traction screw.

No entry gained within three minutes. Pass

Date of test – 8 October 2019
Test engineer(s) – E Creary & D Vinyard
Laboratory temperature – 19.9°C

BS6375:2015 - All Clauses Direct Testing. (Sample 3)

1 off single leaf doorset with a standard threshold and bonded glazing

(Sample ID No. 10184008)

Date sample received: 23 September 2020

Test Results.

1.	Air Permeability	Test sample 3 met the requirements of the Specification, in respect of Clause 6, for Test Pressure Class 2.
2.	Watertightness	Test sample 3 met the requirements of the Specification, in respect of Clause 7, for Test Pressure Class 3a.
3.	Wind Resistance	Test sample 3 met the requirements of the Specification, in respect of BS6375-2:2009, for Exposure Category C3 (1200 Pa).
4.	Operational Strength	Test sample 3 met the requirements of the Specification in respect of BS6375-2:2009.
5.	Basic Security	Test sample 3 met the requirements of the Specification in respect of BS6375-3:2009.

Classifications for Operational Strength.

Operating forces	Class 1
Vertical load	Class 2
Resistance to Static torsion	Class 2
Soft and Heavy body Impact Load bearing	Class 2
Hard body impact	Class 2
Load bearing capacity of safety devices	N/A
Closure against obstruction	Pass
Repeated opening and closing	50.000 cycles completed

Description of Sample 3. (modern standard threshold)

Sample Type -	Single leaf open in doorset with a standard threshold and bonded glazing		
Material -	Aluminium		
Construction -	Mechanically jointed		
Fittings -	A ten-point (ten dead bolts) MCM locking system, key lockable 3* ERA cylinder, three dog bolts and four lift off hinges		
Glass -	Triple glazed 6.8-20-6.4-20-8.8mm laminated glazing unit		
Panel -	Not applicable		
Glass Retention System -	Bonded glazing		
Weathersealing -	Double-sealed plastic weather strip		
Sample dimensions -	Overall length: Active leaf length:	1200mm 1070mm	Height: 2400mm Height: 2330mm
Date of test -	25 September 2019		
Laboratory temperature -	17.6°C		
Laboratory humidity -	68.0%RH		
Atmospheric pressure -	99.9kPa		
Test engineers -	David Vinyard		

Smarts Modern Designer door with MCM Locking (standard threshold).

Outer Frame width	1200mm	**Outer Frame Material**	Aluminium
Outer Frame height	2400mm	**Outer Frame Gasket**	
Outer Frame Part Numbers		Gasket Type	EDPM
Top	SPD702	Manufacturer	Reddiplex
Bottom	SPD702	Product Name	Flipper Gasket, Central Gasket
Lock Side	SPD702	Product Code	ACET160R, ACPD725
Hinge Side	SPD702	**Threshold**	
Outer Frame section dimensions		Manufacturer	Smart Systems
Width	70mm	Product name	Standard Threshold
Depth	62mm	Product Code	SPD702
Reinforcing:		Materials	Aluminium
Manufacturer	NA	**Outer Frame Joint Method**	
Product Name		Head	Corner Cleat
Product code		Foot	T Joint Cleat
Material			

Leaf		**Leaf Material:**	Aluminium
Leaf Width:	1126mm	**Leaf Gasket**	
Leaf Height:	2352mm	Gasket type:	EDPM
Leaf Part Numbers:		Manufacturer:	Trelleborg
Top:	SPD705	Product Name:	Flipper Gasket
Bottom:	SPD705	Product Code	ACPD724
Lock side:	SPD705	**Leaf Panel Slab**	
Hinge Side	SPD705	Manufacturer:	Smart Systems
Leaf section size		Product name:	Leaf Panel Slab
Width:	129mm	Product code:	ACPD 131
Depth:	70mm	Material:	Aluminium
		Leaf joint method	
		Head:	Cleat, Glue and Tension Block
		Foot:	Cleat, Glue And Tension Block
Bead			
Manufacturer:	NA		
Product Name:			
Product Code:			
Material:			
Bead Size:			

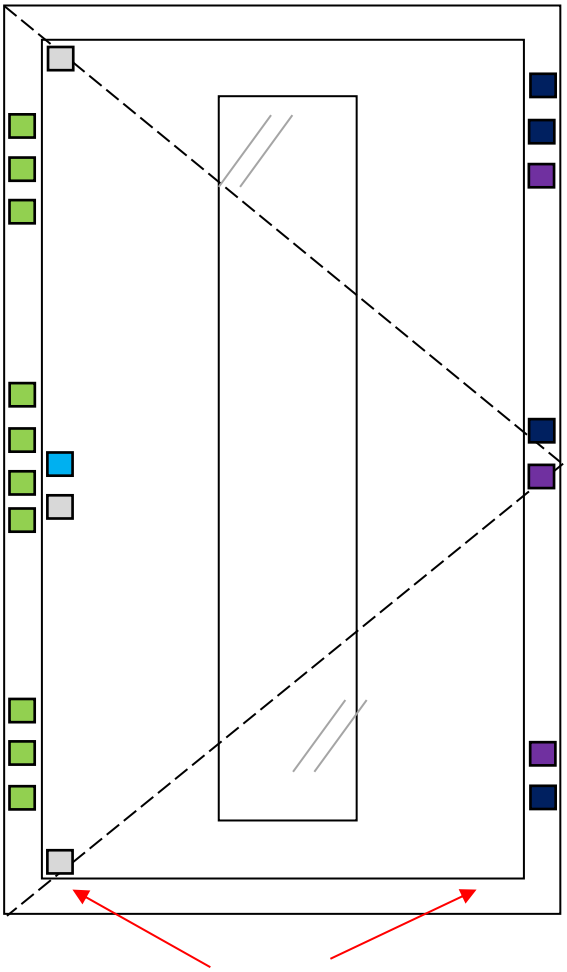
Smarts Modern Designer door with MCM Locking (standard threshold).

Glazing Unit		**Glazing Gasket**	
Manufacturer:	Cornwall Glass	Gasket Type:	NA
Inner Thickness:	6.8mm Laminated Planitherm Total	Manufacturer:	
Spacer Material:	22 mm Warm Edge Spacer	Product Name:	
Outer Thickness:	8.8mm Laminated	Product Code	
Unit Sizes:	280mm X 1550mm x 66mm		
Glazing Tape Details		Manufacturer:	
Manufacturer:	UK Industrial Tapes	Product Name:	
Product Name:	Glazing tape	Product Code	
Product Code	ACPD902 - 909		

Hardware			**Fixings**	**Quantity**
Hinges:	ACPD730	TECNAC	M6 Machine Screws	4
Hinge Protectors:	ACPD735	Smart Systems	ACET 060	3
Lock:	ACPD682	MCM Lock	ACET060	1
Cylinder:	ACCY3063TTS3	Era	M5 Machine Screw	1
Handle:	ACPD 750	Blu Pull Handle	Supplied with handle	2
Touch Bar:	NA			
Cylinder Support:	NA			
Cylinder Escutcheon:	ACPD 740	Era	M5 Machine Screws	1
Keeps:	ACPD687	Supplied with Lock	ACET 060	1
Drip Bar	SPD706	Smart Systems	ACET099	1
Low Threshold End caps	ACPD704	Smart Systems		1 pair.
Drip End Caps	ACPD706	Smart Systems		1 pair.

Note – parts list supplied by client but not verified by BSI

Elevation Drawing Showing Position of Hardware.



water leakage point

Handle:
Hinge:
Dog Bolt:
Dead Bolt:
Transducer placement:

Graph of Air Permeability Before Gusting. (Sample 3)

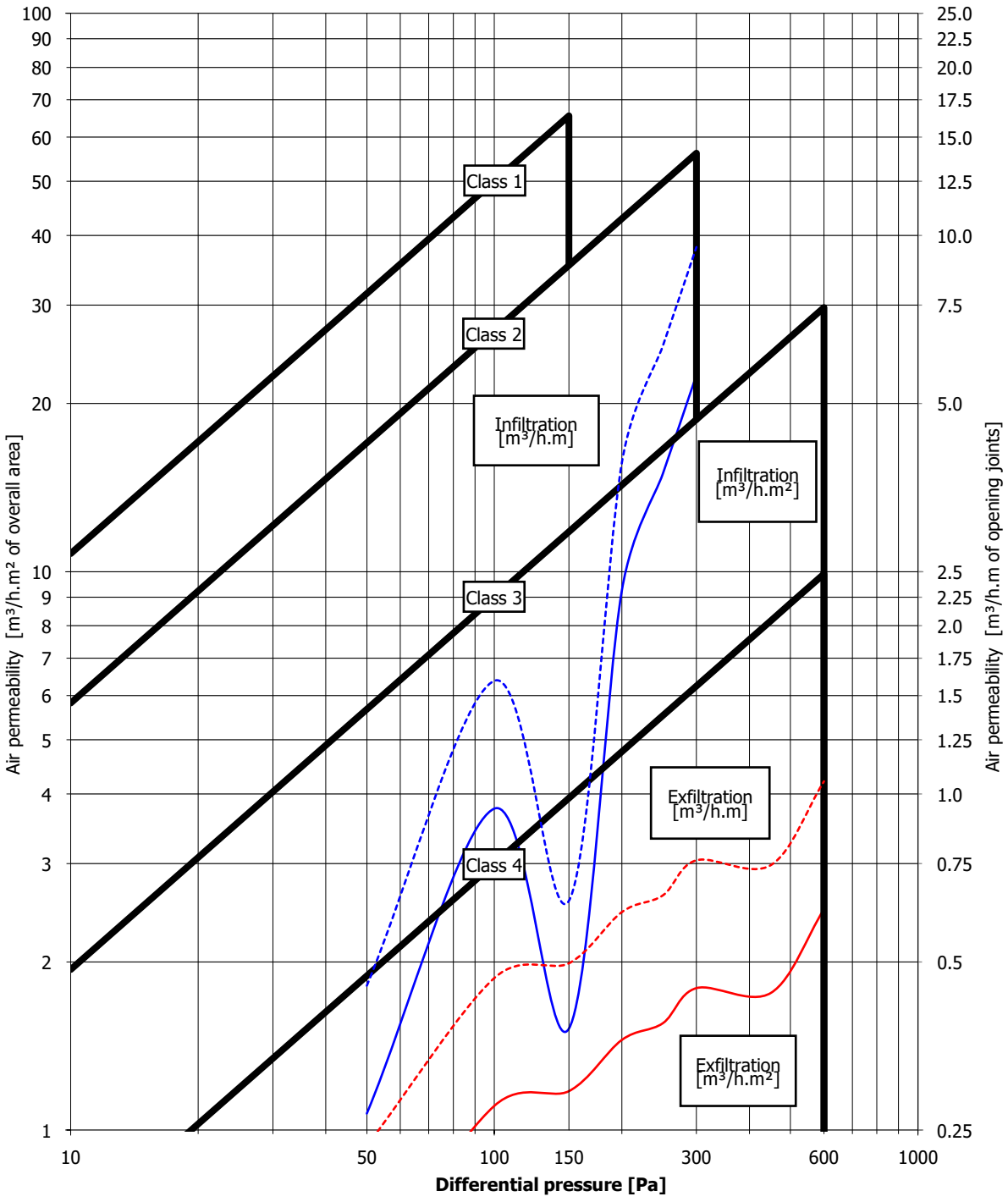


Table of Air Permeability Before Gusting. (Sample 3)

AIR PERMEABILITY TEST RESULTS - BS EN 1026:2000 / BS EN 12207:2000

Three positive pressure pulses of 660Pa were applied prior to testing

Air Pressure [Pa]	Blank reading [m³/h]	Maximum total air flow [m³/h]	Actual rate of air leakage [m³/h]	Rate of air leakage per meter length of opening joint [m³/h.m]	Rate of air leakage relative to area of sample [m³/h.m²]
50	7.7	11.2	3.5	0.51	1.21
100	13.6	21.6	8.0	1.17	2.76
150	16.3	24.1	7.8	1.14	2.69
200	21.0	41.2	20.1	2.95	6.97
250	24.5	68.6	43.8	6.45	15.23
300	27.8	90.7	62.5	9.20	21.72
-50	5.1	7.9	2.8	0.41	0.97
-100	8.3	12.4	4.1	0.60	1.42
-150	12.4	15.6	3.2	0.47	1.10
-200	15.8	19.3	3.5	0.51	1.21
-250	18.8	21.0	2.2	0.32	0.76
-300	20.7	25.7	5.0	0.73	1.73
-450	29.6	33.0	3.4	0.50	1.17
-600	34.7	41.1	6.4	0.94	2.21

Total opening perimeter = 6.8m

Overall area = 2.88m²

BS EN 12207:2000 - Joint class = 2

BS EN 12207:2000 - Area class = 2

BS EN 12207:2000 - Overall class before gusting = 2

Graph of Average Air Permeability Before Gusting. (Sample 3)

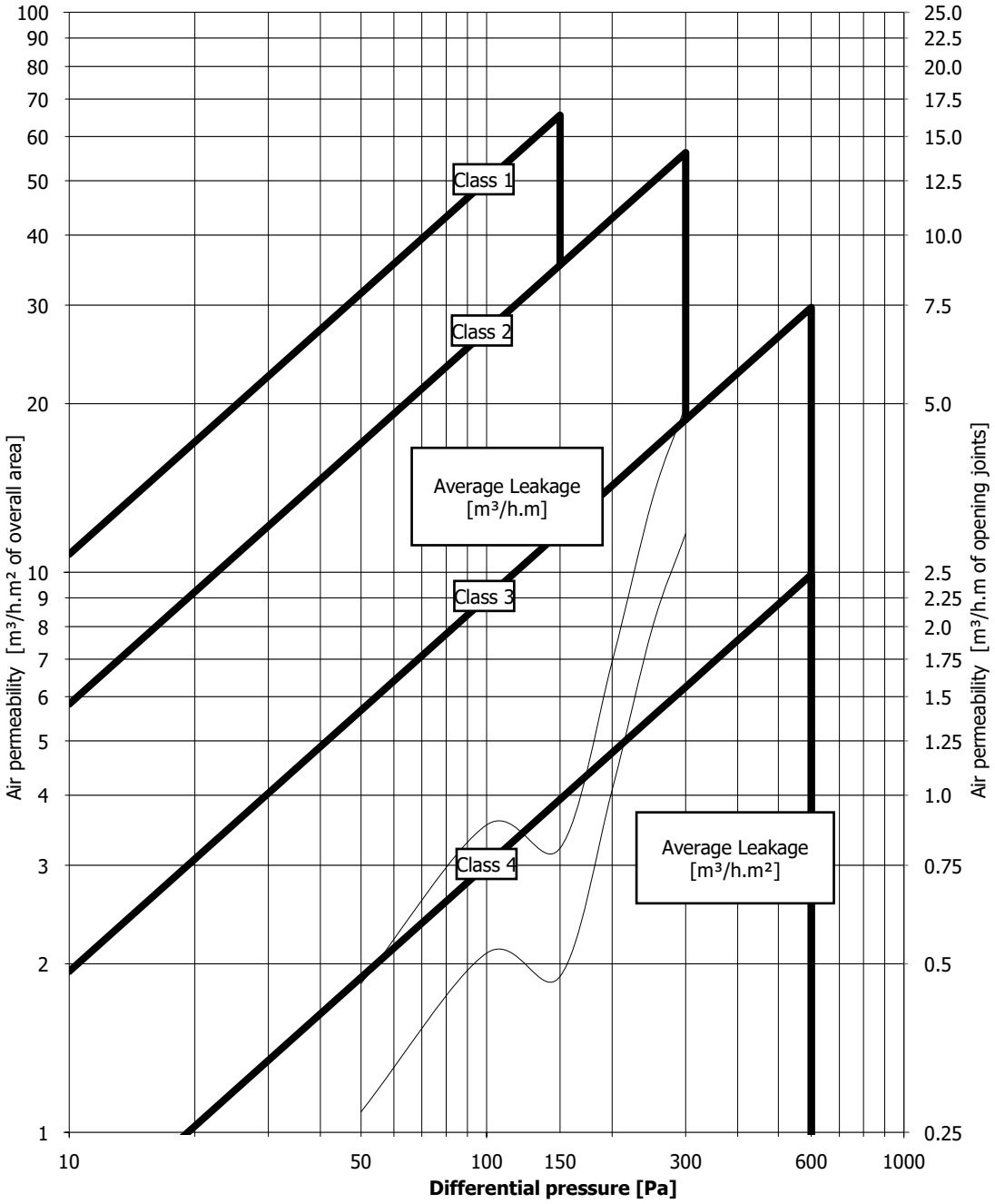


Table of Average Air Permeability Before Gusting. (Sample 3)

AIR PERMEABILITY TEST RESULTS - BS 6375-1:2015 / BS EN 1026:2000

Three positive pressure pulses of 660Pa were applied prior to testing

Air Pressure [Pa]	Average rate of air leakage [m³/h]	Average rate of air leakage per meter length of opening joint [m³/h.m]	Average rate of air leakage relative to area of sample [m³/h.m²]
50	3.1	0.46	1.09
100	6.0	0.88	2.09
150	5.5	0.80	1.90
200	11.8	1.73	4.09
250	23.0	3.39	7.99
300	33.8	4.96	11.72

Note: The figures in the table above give the leakage as an average of the leakage at positive pressure and the leakage at negative pressure

Total opening perimeter = 6.8m

Overall area = 2.88m²

BS 6375-1:2015 Clause 6.3 - Joint class = 2

BS 6375-1:2015 Clause 6.3 - Area class = 2

BS 6375-1:2015 Clause 6.3 - Overall class = 2

Watertightness Test Results. (Sample 3)

BS EN 1027:2000 Clause 7 watertightness before resistance to wind loads

TABLE 2 – Spraying method 1A

Pressure (Pa)	Point at which water leakage occurred
0	No leakage
50	No leakage
100	No leakage
150	Water leaked out and over the threshold at 46 seconds
200	-
250	-
300	-
450	-
600	-
750	-
900	-
1050	-

Wind Load Resistance Test Results.

Clause 8 Resistance to Wind Load

P1 Deflection Test

Three positive pulses of 1320Pa were applied.

No visible failures or functional defects of the test sample were observed after wind loads were applied at a positive air pressure of 1200Pa.

Actual deflection 5.46mm (maximum deflection allowed 7.50mm)

Deflection/span ratio 1/412 (maximum ratio allowed 1/300)

Three negative pulses of 1320Pa were applied.

No visible failures or functional defects of the test sample were observed after wind loads were applied at a negative air pressure of 1200Pa.

Actual deflection 4.22mm (maximum deflection allowed 7.50mm)

Deflection/span ratio 1/533 (maximum ratio allowed 1/300)

Wind Load Resistance Test Results. (continued)

Clause 8 Resistance to Wind Load (continued)

P2 Repeated Pressure Test

No visible failures or defects of the test sample were observed after 50 cycles of repeated wind loads were applied at a positive air pressure of 600Pa.

No visible failures or defects of the test sample were observed after 50 cycles of repeated wind loads were applied at a negative air pressure of 600Pa.

Graph of Air Permeability After Gusting. (Sample 3)

(including +20% lines for each class)

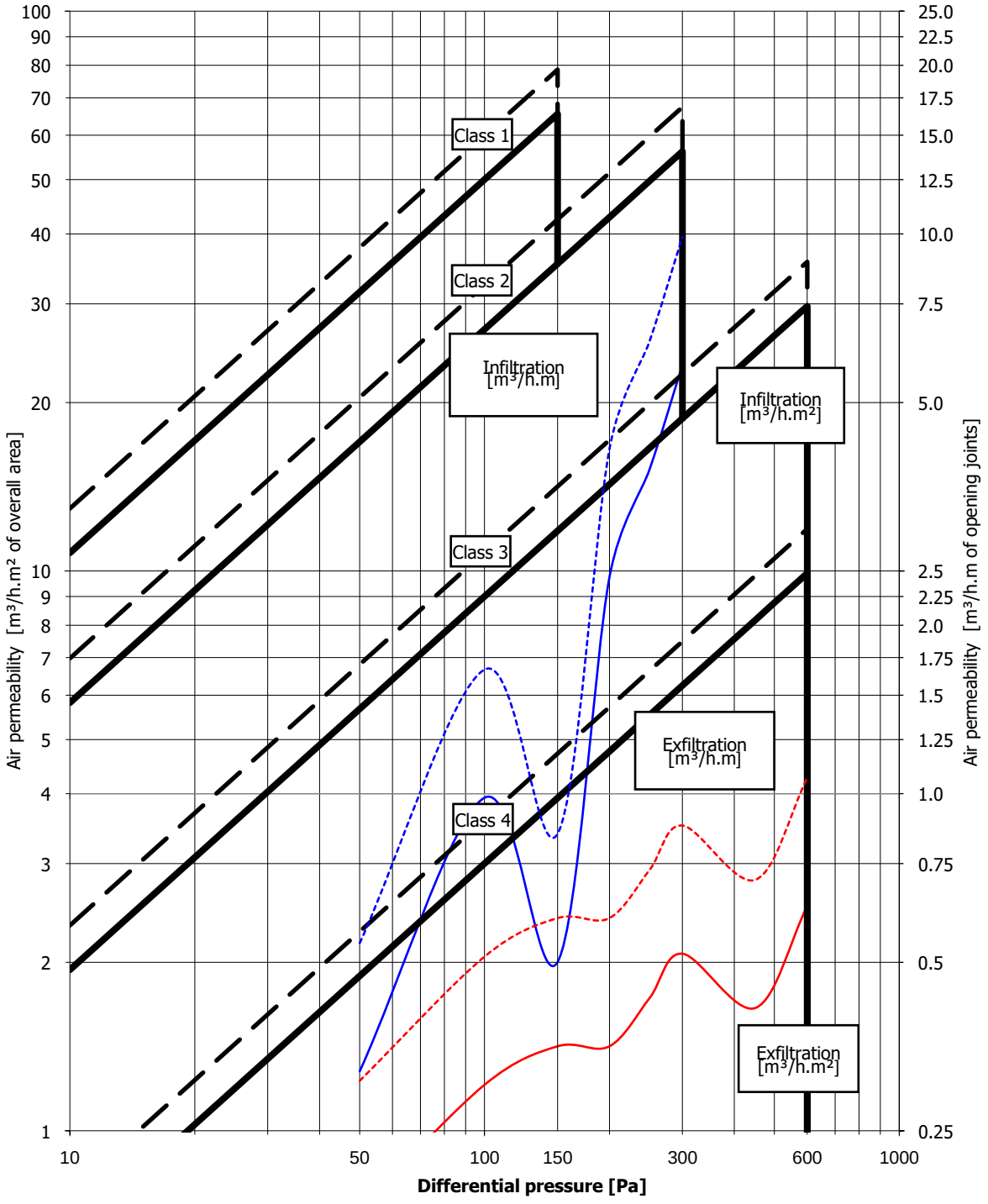


Table of Air Permeability After Gusting. (Sample 3)

AIR PERMEABILITY TEST RESULTS - BS EN 1026:2000 / BS EN 12207:2000

Three positive pressure pulses of 660Pa were applied prior to testing

Air Pressure [Pa]	Blank reading [m³/h]	Maximum total air flow [m³/h]	Actual rate of air leakage [m³/h]	Maximum rate of air leakage per meter length of opening joint [m³/h.m]	Maximum rate of air leakage relative to area of sample [m³/h.m²]
50	9.9	13.6	3.7	0.54	1.28
100	15.4	26.8	11.3	1.67	3.94
150	19.1	24.9	5.8	0.85	2.00
200	23.1	51.3	28.0	4.12	9.74
250	27.4	71.4	43.8	6.43	15.19
300	30.2	97.8	67.2	9.88	23.34
-50	6.9	9.0	2.1	0.31	0.73
-100	10.1	13.6	3.5	0.51	1.21
-150	13.4	17.5	4.1	0.60	1.42
-200	16.9	21.0	4.1	0.60	1.42
-250	19.6	24.6	5.0	0.73	1.73
-300	22.6	28.6	6.0	0.88	2.07
-450	31.4	36.2	4.8	0.70	1.66
-600	37.8	45.1	7.3	1.07	2.52

Total opening perimeter = 6.8m

Overall area = 2.88m²

Graph of Average Air Permeability After Gusting. (Sample 3)

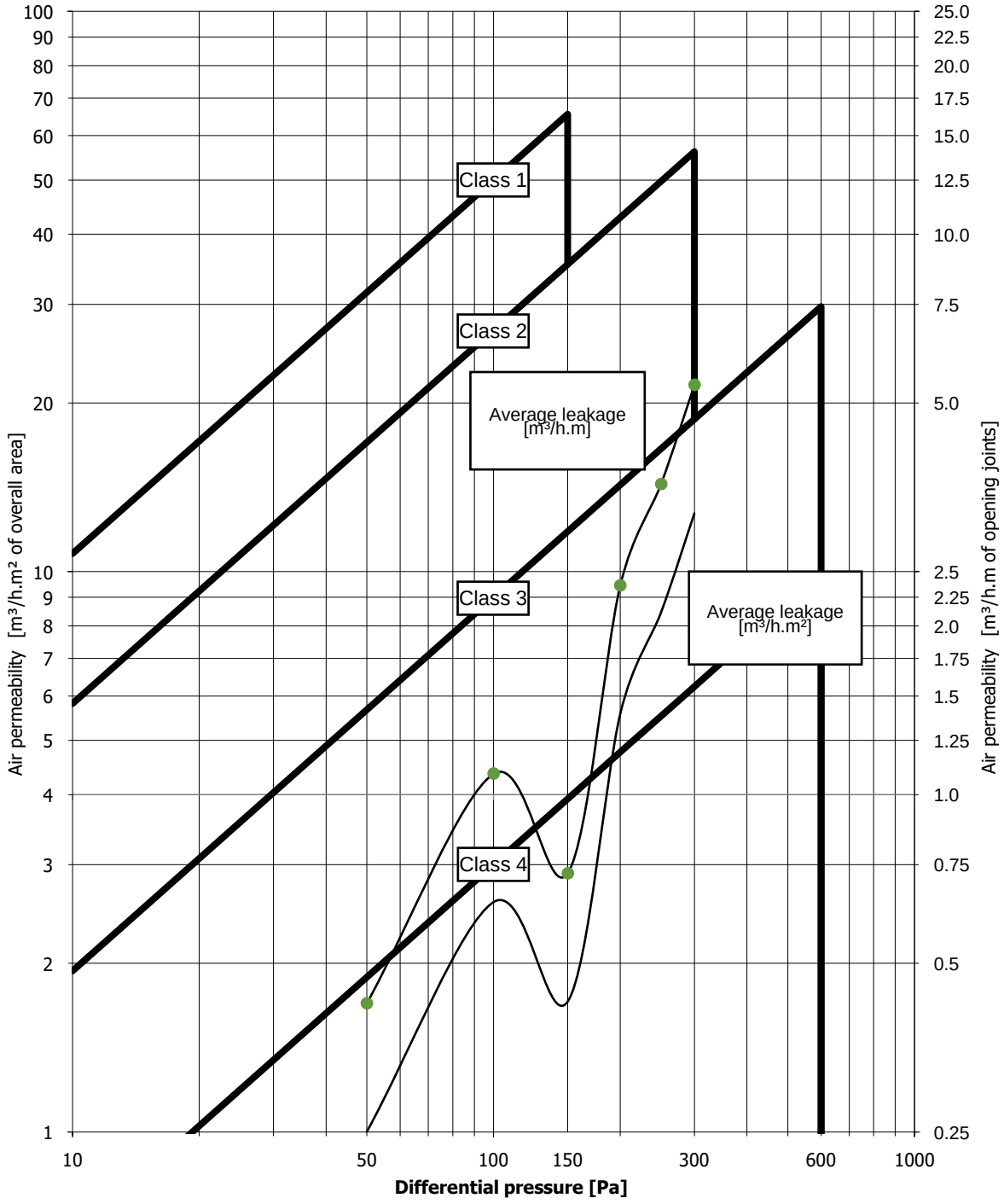


Table of Average Air Permeability After Gusting. (Sample 3)

AIR PERMEABILITY TEST RESULTS - BS 6375-1:2015 / BS EN 1026:2000

Three positive pressure pulses of 660Pa were applied prior to testing

Air Pressure [Pa]	Average rate of air leakage [m³/h]	Average rate of air leakage per meter length of opening joint [m³/h.m]	Average rate of air leakage relative to area of sample [m³/h.m²]
50	2.9	0.42	1.00
100	7.4	1.09	2.57
150	4.9	0.72	1.71
200	16.1	2.36	5.58
250	24.4	3.58	8.46
300	36.6	5.38	12.71

Note: The figures in the table above give the leakage as an average of the leakage at positive pressure and the leakage at negative pressure

Total opening perimeter = 6.8m

Overall area = 2.88m²

BS 6375-1:2015 Clause 6.5 - Joint class = 2

BS 6375-1:2015 Clause 6.5 - Area class = 2

BS 6375-1:2015 Clause 6.5 - Overall class = 2

Wind Load Resistance Test Results. (continued)

Clause 8 Resistance to Wind Load (continued)

P3 Safety Test

No parts of the test sample became detached and the test sample remained closed after a wind load safety test was applied at a positive air pressure of 1800Pa.

No parts of the test sample became detached and the test sample remained closed after a wind load safety test was applied at a negative air pressure of 1800Pa.

Clause 6.2 Operating Forces: EN12046-2:2000 and EN12217:2015 (Class 1)

Assessment

The sample was tested three times – closing the leaf, lifting the handle, locking the key, unlocking the key, opening the handle and opening the leaf – and the average force recorded

Closing leaf force – 24.43N (maximum 75N) Pass

Handle closing – N/A

Key Torque to lock – <1.00Nm Pass

Key Torque to unlock – <1.00Nm Pass

Handle opening – N/A

Force to maintain opening – N/A

Clause 6.3.1 Vertical Load (Class 2)

All loads were applied and removed in maximum increments of 100N.

The diagonal measurement of the door was taken to the nearest 1mm (bottom hinge side corner to top lock side corner).

A pre-load of 200±4N was applied vertically to the top corner of the lock side of the door leaf, at 50±5mm from the opening edge and maintained for 60±5 seconds. The load was then removed, and the sample left to rest for 60±5 seconds.

The gauge was zeroed before a 600N load (Class 2) was applied to the same loading point for 300±5 seconds, and the maximum deformation was measured.

The load was removed and after 180±5 seconds the residual deflection and diagonal measurements were taken.

Initial diagonal measurement – 2590mm

Maximum deformation – 1.90 mm

Residual deformation – 0.85 mm

Final diagonal measurement – 2590mm

For the door to pass the residual deformation must not exceed 1.0mm Pass

Clause 6.3.2 Resistance to Static Torsion (Class 2) Assessment

All loads were applied and removed in maximum increments of 100N.

The door leaf was opened to 90° then fixed at the top lock side corner, 50 ± 5mm from the edge.

A pre-load of 200 ± 4N was applied horizontally and normally to the plane of the leaf at the lower lock side corner, 50 ± 5mm from the edge and maintained for 60 ± 5 seconds.

After one minute the gauge was zeroed and a load of 250N (Class 2) was applied for 300 ± 5 seconds before the maximum deformation was measured. The load was then removed, and the sample left to rest for 180 ± 5 seconds before the residual deformation was measured.

Maximum deformation – 27.20mm

Residual deformation – 1.85mm

For the door to pass the residual deformation must not exceed 2.0mm Pass

Clause 6.3.3 Soft and Heavy Body Impact (Class 2)

The door was closed to its normal operating mode and the sample was marked at the centre of the door leaf.

The deviation across the width of the door was measured at the impact point.

A 30±0.6kg leather impactor was raised to the required drop height and impacted three times to each face, and the deviation was measured again.

For the door to achieve the required class it shall not exceed 2mm residual measurement.

Residual measurement – 0.05mm Pass

Clause 6.3.4 Hard Body Impact (Class 2)

The door leaf was mounted horizontally with rigid supports under the long edges of the leaf and pattern 2 was selected. Glazed impact points were omitted, and the exterior face was impacted.

If permanent damage is left after impact, measurements are taken after 30 minutes.

Mean of the diameter – 4.00mm

Mean of the depth – 0.10mm

The mean to qualify for a class shall not exceed 20mm, and the mean for the depth shall not exceed 1.0mm. Pass

BS 6375-2:2009.

Closure Against Obstruction — Assessment

The objective of this test is to determine the resistance of a doorset to closure of the door leaf against small objects such as toys which may be accidentally trapped between the leaf and the frame.

A 50 x 50 x 10mm aluminium block was placed in the gap between the leaf and the bottom of the hinge side jamb.

A 200N force was applied to the lock side of the leaf and held for 15 ± 5 seconds.

The leaf was then opened and closed five time and the operating forces were repeated.

Clause 6.2 Operating Forces: EN12046-2:2000 and EN12217:2015 (Class 1)

The sample was tested three times – closing the leaf, lifting the handle, locking the key, unlocking the key, opening the handle and opening the leaf – and the average force recorded.

Closing leaf force – 38.20N (maximum 75N) — Pass

Handle closing – N/A

Key Torque to lock – < 1.00Nm (maximum 5Nm) — Pass

Key Torque to unlock – < 1.00Nm (maximum 5Nm) — Pass

Handle opening – N/A

Force to maintain N/A

Basic Security (Annex A).

BS 6375-3:2009

The objective of this test is to establish if, from the outside, entry can be gained by defeating the glazing or locking system.

The force used did not result in permanent set or plastic deformation of any tool.

Damaged tools shall be replaced. The test did not exceed the maximum three-minute time period.

The screwdriver was used to no effect.

No entry gained within three minutes. — Pass

BS EN 1191:2000. Modern door with MCM Locking

Clause 5.5 Repeated Opening and Closing Assessment

Operated for 50,000 cycles - main mode, master leaf

The sample was opened and closed five times before testing was started.

Rotation of key to unlock - 360°

Clause 6.2 Operating Forces: EN12046-2:2000 and EN12217:2015 (pre-test operation)

The sample was tested three times – closing the leaf, lifting the handle, locking the key, unlocking the key, opening the handle and opening the leaf – and the average force recorded.

Closing leaf force – 62.51N (maximum 75N)	Pass
Handle closing – N/A (maximum 100N)	Pass
Key force to lock – < 1.00Nm (maximum 5Nm)	Pass
Key force to unlock – < 1.00Nm (maximum 5Nm)	Pass
Handle opening – N/A (maximum 100N)	Pass
Force to maintain opening – 54.68N (maximum 75N)	Pass

After 50,000 cycles the operating forces were recorded again

Closing leaf force – 64.43 (maximum 75N)	Pass
Handle closing – N/A (maximum 100N)	Pass
Key force to lock – < 1.00Nm (maximum 5Nm)	Pass
Key force to unlock – < 1.00Nm (maximum 5Nm)	Pass
Handle opening – N/A (maximum 100N)	Pass
Force to maintain opening – 56.83N (maximum 75N)	Pass

The sample met the requirements of the standard and remained within operating forces for 50,000 cycles

BS:6375-1:2015 (Part 1 Only) Direct Testing – (Sample 4)

1 off single leaf doorset with a low threshold and bonded glazing

(Sample ID No. 10184008)

Date sample received: 23 September 2019

Test Results.

1.	Air Permeability	Test sample 4 met the requirements of the Specification, in respect of Clause 6, for Test Pressure Class 2.
2.	Watertightness	Test sample 4 met the requirements of the Specification, in respect of Clause 7, for Test Pressure Class 3a.
3.	Wind Resistance	Test sample 4 met the requirements of the Specification, in respect of BS6375-2:2009, for Exposure Category C3 (1200 Pa).

Classifications for Operational Strength.

Operating forces	Class 1

Description of Sample 4. (modern low threshold)

Sample Type -	Single leaf open in doorset with a low threshold and bonded glazing		
Material -	Aluminium		
Construction -	Mechanically jointed		
Fittings -	A ten-point (ten dead bolts) MCM locking system, key lockable 3* ERA cylinder, three dog bolts and four lift off hinges		
Glass -	Double glazed 4-20-4mm laminated glass unit		
Panel -	Not applicable		
Glass Retention System -	Bonded glazing		
Weathersealing -	Double-sealed plastic weather strip		
Sample dimensions -	Overall length: Active leaf length:	1200mm 1070mm	Height: 2400mm Height: 2330mm
Date of test -	23 January 2020		
Laboratory temperature -	20.9°C		
Laboratory humidity -	40.8%RH		
Atmospheric pressure -	101.9kPa		
Test engineers -	David Vinyard		

Smarts Modern Designer door with MCM Locking (low threshold).

Outer Frame width	1200mm	**Outer Frame Material**	Aluminium
Outer Frame height	2400mm	**Outer Frame Gasket**	
Outer Frame Part Numbers		Gasket Type	EDPM
Top	SPD702	Manufacturer	Reddiplex
Bottom	SPD703	Product Name	Flipper Gasket, Central Gasket,Threshold Gasket
Lock Side	SPD702	Product Code	ACET160R, ACPD725.ACET232
Hinge Side	SPD702	**Threshold**	
Outer Frame section dimensions		Manufacturer	Smart Systems
Width	70mm	Product name	Low Threshold
Depth	62mm	Product Code	SPD703
Reinforcing:		Materials	Aluminium
Manufacturer	NA	**Outer Frame Joint Method**	
Product Name		Head	Corner Cleat
Product code		Foot	T Joint Cleat
Material			

Leaf		**Leaf Material:**	Aluminium
Leaf Width:	1126mm	**Leaf Gasket**	
Leaf Height:	2352mm	Gasket type:	EDPM
Leaf Part Numbers:		Manufacturer:	Trelleborg
Top:	SPD705	Product Name:	Flipper Gasket
Bottom:	SPD705	Product Code	ACPD724
Lock side:	SPD705	**Leaf Panel Slab**	
Hinge Side	SPD705	Manufacturer:	Smart Systems
Leaf section size		Product name:	Leaf Panel Slab
Width:	129mm	Product code:	ACPD 131
Depth:	70mm	Material:	Aluminium
		Leaf joint method	
		Head:	Cleat, Glue and Tension Block
		Foot:	Cleat, Glue And Tension Block
Drip Section			
Manufacturer:	Smart Systems		
Product Name:	Drip		
Product Code:	SPD706		
Material:	Aluminium		
Drip Size:	34.5mm x 30.5mm		

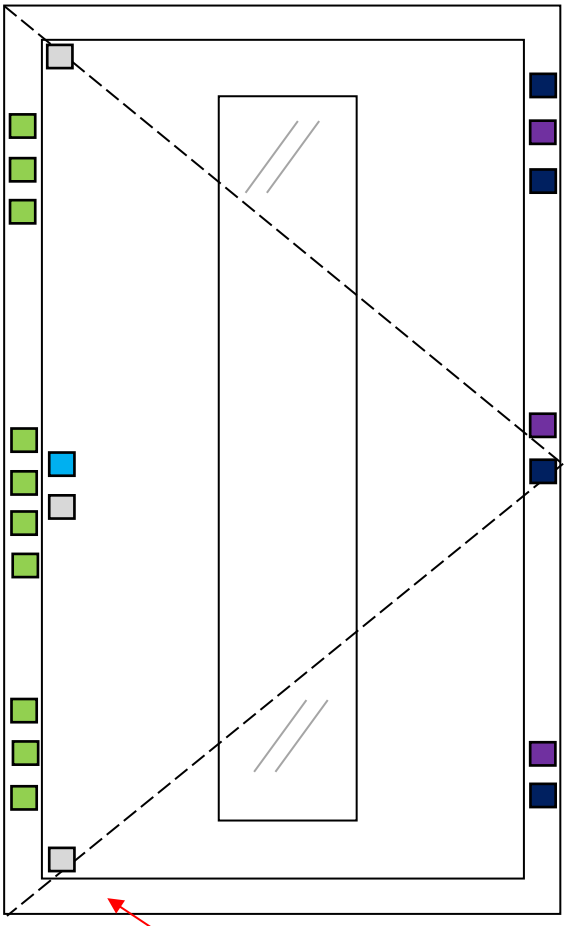
Smarts Modern Designer door with MCM Locking (low threshold).

Glazing Unit		**Glazing Gasket**	
Manufacturer:	Cornwall Glass	Gasket Type:	NA
Inner Thickness:	6.8mm Laminated Planitherm Total	Manufacturer:	
Spacer Material:	22 mm Warm Edge Spacer	Product Name:	
Outer Thickness:	8.8mm Laminated	Product Code	
Unit Sizes:	280mm X 1550mm x 66mm		
Glazing Tape Details		Manufacturer:	
Manufacturer:	UK Industrial Tapes	Product Name:	
Product Name:	Glazing tape	Product Code	
Product Code	ACPD902 - 909		

Hardware			**Fixings**	**Quantity**
Hinges:	ACPD730	TECNAC	M6 Machine Screws	4
Hinge Protectors:	ACPD735	Smart Systems	ACET 060	3
Lock:	ACPD670	Fuhr Slam Lock	ACET060	1
Cylinder:	ACCY3063TTS3	Era	M5 Machine Screw	1
Handle:	ACPD 630	Blu Pull Handle	Supplied with handle	2
Touch Bar:	NA			
Cylinder Support:	NA			
Cylinder Escutcheon:	ACPD 740	Era	M5 Machine Screws	1
Keeps:	ACPD677	SUPPLIED WITH LOCK	ACET 060	1
Drip Bar	SPD706	Smart Systems	ACET099	1
Low Threshold End caps	ACPD704	Smart Systems		1 pair.
Drip End Caps	ACPD706	Smart Systems		1 pair.
Drip Section Wool Pile	ACSR011	Smart Systems		

Note – parts list supplied by client but not verified by BSI

Elevation Drawing Showing Position of Hardware.



Handle:

Hinge:

Dog Bolt:

Dead Bolt:

Transducer placement:

Graph of Air Permeability Before Gusting. (Sample 4)

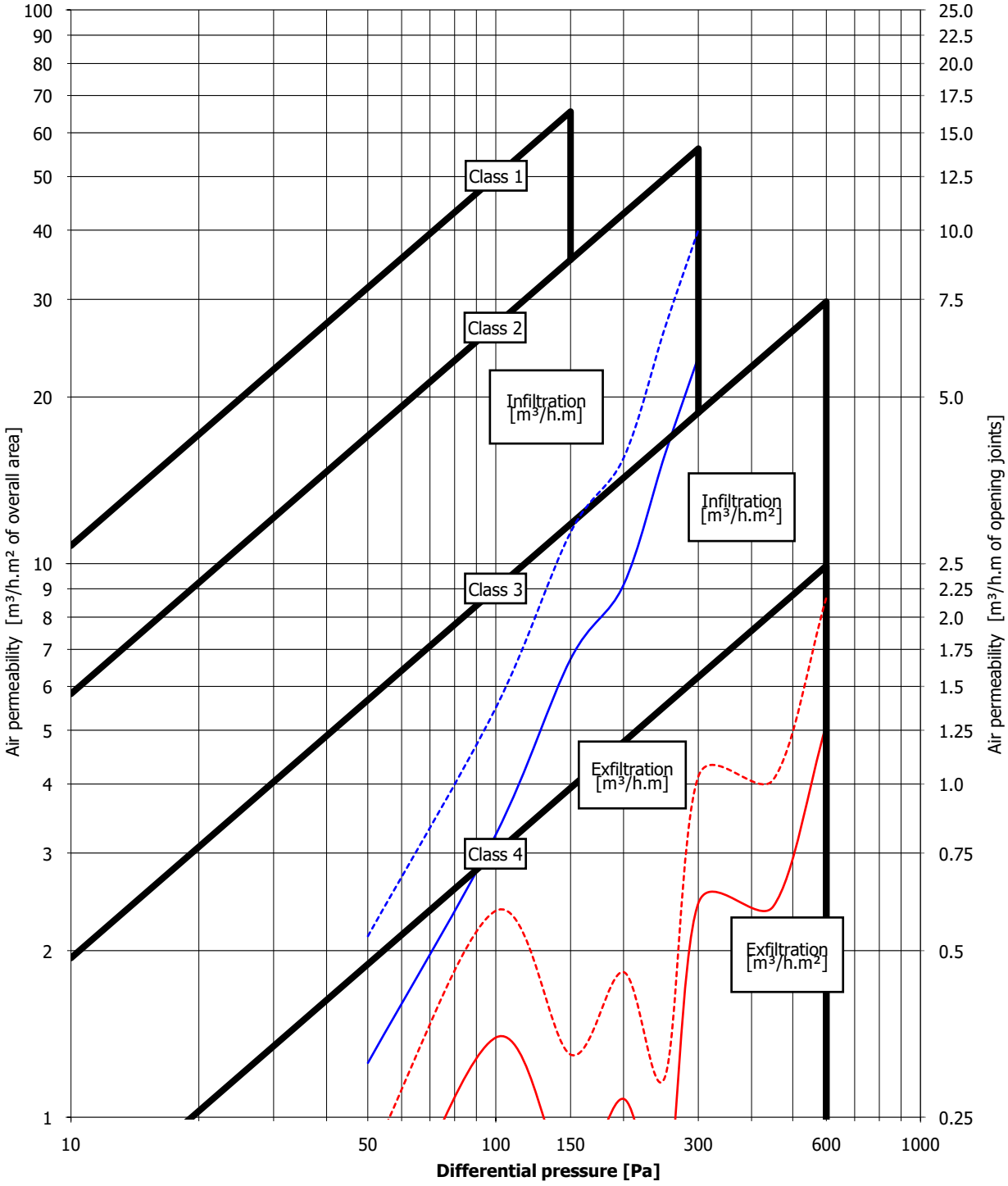


Table of Air Permeability Before Gusting. (Sample 4)

AIR PERMEABILITY TEST RESULTS - BS EN 1026:2000 / BS EN 12207:2000

Three positive pressure pulses of 660Pa were applied prior to testing

Air Pressure [Pa]	Blank reading [m³/h]	Maximum total air flow [m³/h]	Actual rate of air leakage [m³/h]	Rate of air leakage per meter length of opening joint [m³/h.m]	Rate of air leakage relative to area of sample [m³/h.m²]
50	10.5	14.1	3.6	0.53	1.25
100	16.6	25.9	9.3	1.37	3.24
150	19.7	39.0	19.4	2.85	6.72
200	23.9	50.2	26.4	3.88	9.16
250	28.8	73.9	45.2	6.65	15.70
300	31.2	99.1	68.1	10.01	23.64
-50	8.7	10.1	1.4	0.21	0.49
-100	11.9	15.9	4.0	0.59	1.39
-150	15.8	18.0	2.2	0.32	0.77
-200	18.9	22.0	3.1	0.46	1.08
-250	21.8	23.8	2.0	0.29	0.70
-300	24.0	31.0	7.0	1.03	2.44
-450	36.0	42.9	6.9	1.02	2.40
-600	56.3	71.0	14.7	2.17	5.12

Total opening perimeter = 6.8m

Overall area = 2.88m²

BS EN 12207:2000 - Joint class = 2

BS EN 12207:2000 - Area class = 2

BS EN 12207:2000 - Overall class before gusting = 2

Graph of Average Air Permeability Before Gusting. (Sample 4)

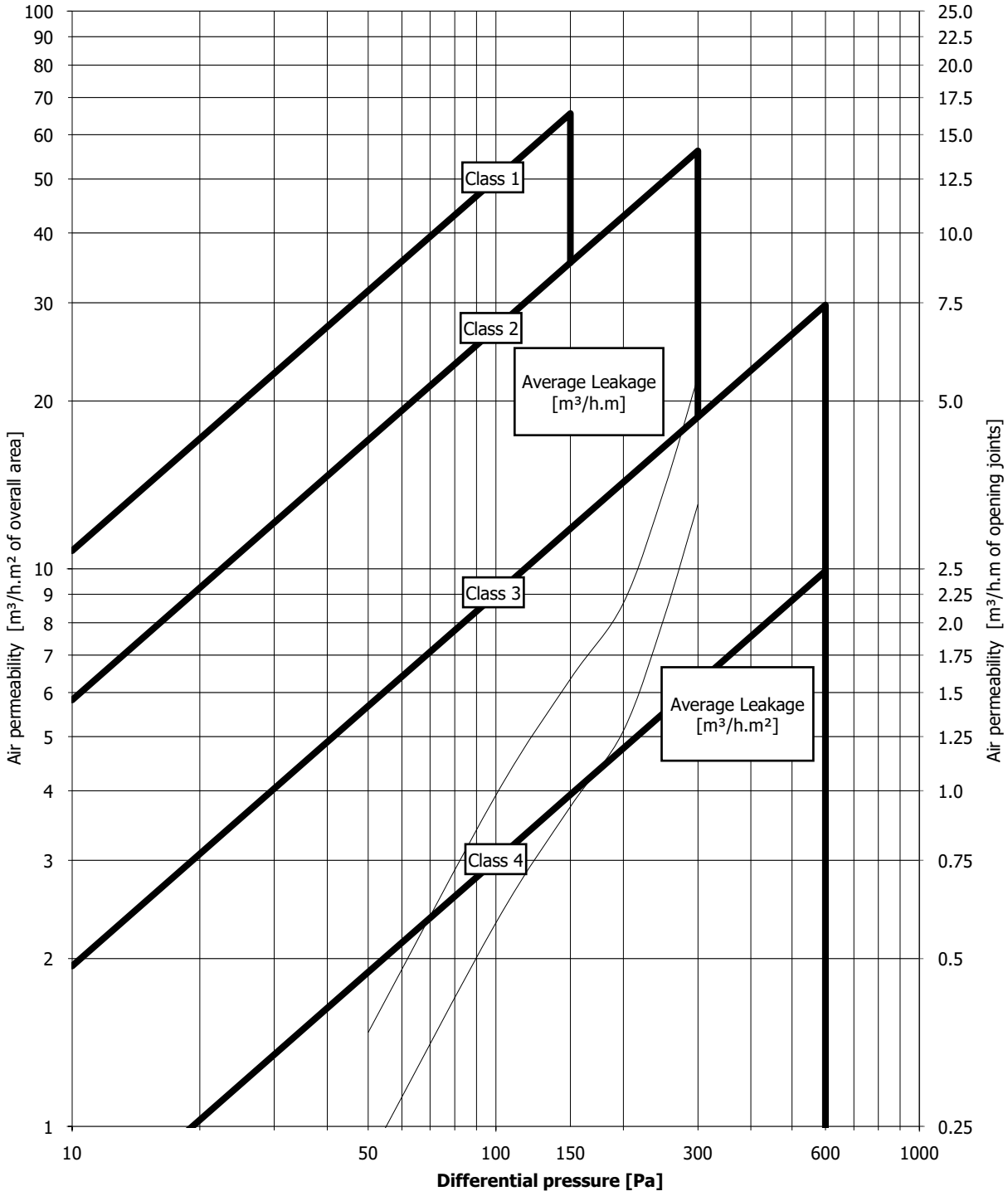


Table of Average Air Permeability Before Gusting. (Sample 4)

AIR PERMEABILITY TEST RESULTS - BS 6375-1:2015 / BS EN 1026:2000

Three positive pressure pulses of 660Pa were applied prior to testing

Air Pressure [Pa]	Average rate of air leakage [m³/h]	Average rate of air leakage per meter length of opening joint [m³/h.m]	Average rate of air leakage relative to area of sample [m³/h.m²]
50	2.5	0.37	0.87
100	6.7	0.98	2.32
150	10.8	1.59	3.74
200	14.7	2.17	5.12
250	23.6	3.47	8.20
300	37.6	5.52	13.04

Note: The figures in the table above give the leakage as an average of the leakage at positive pressure and the leakage at negative pressure

Total opening perimeter = 6.8m

Overall area = 2.88m²

BS 6375-1:2015 Clause 6.3 - Joint class = 2

BS 6375-1:2015 Clause 6.3 - Area class = 2

BS 6375-1:2015 Clause 6.3 - Overall class = 2

Watertightness Test Results. (Sample 4)

BS EN 1027:2000 Clause 7 watertightness before resistance to wind loads

TABLE 2 – Spraying method 1A

Pressure (Pa)	Point at which water leakage occurred
0	No leakage
50	No leakage
100	No leakage
150	Water leaked out and over the threshold at 34 seconds
200	-
250	-
300	-
450	-
600	-
750	-
900	-
1050	-

Wind Load Resistance Test Results.

Clause 8 Resistance to Wind Load

P1 Deflection Test

Three positive pulses of 1320Pa were applied.

No visible failures or functional defects of the test sample were observed after wind loads were applied at a positive air pressure of 1200Pa.

Actual deflection 6.60mm (maximum deflection allowed mm)

Deflection/span ratio 1/341 (maximum ratio allowed 1/300)

Three negative pulses of 1320Pa were applied.

No visible failures or functional defects of the test sample were observed after wind loads were applied at a negative air pressure of 1200Pa.

Actual deflection 5.85mm (maximum deflection allowed mm)

Deflection/span ratio 1/385 (maximum ratio allowed 1/300)

Wind Load Resistance Test Results. (continued)

Clause 8 Resistance to Wind Load (continued)

P2 Repeated Pressure Test

No visible failures or defects of the test sample were observed after 50 cycles of repeated wind loads were applied at a positive air pressure of 600Pa.

No visible failures or defects of the test sample were observed after 50 cycles of repeated wind loads were applied at a negative air pressure of 600Pa.

Graph of Air Permeability After Gusting. (Sample 4)

(including +20% lines for each class)

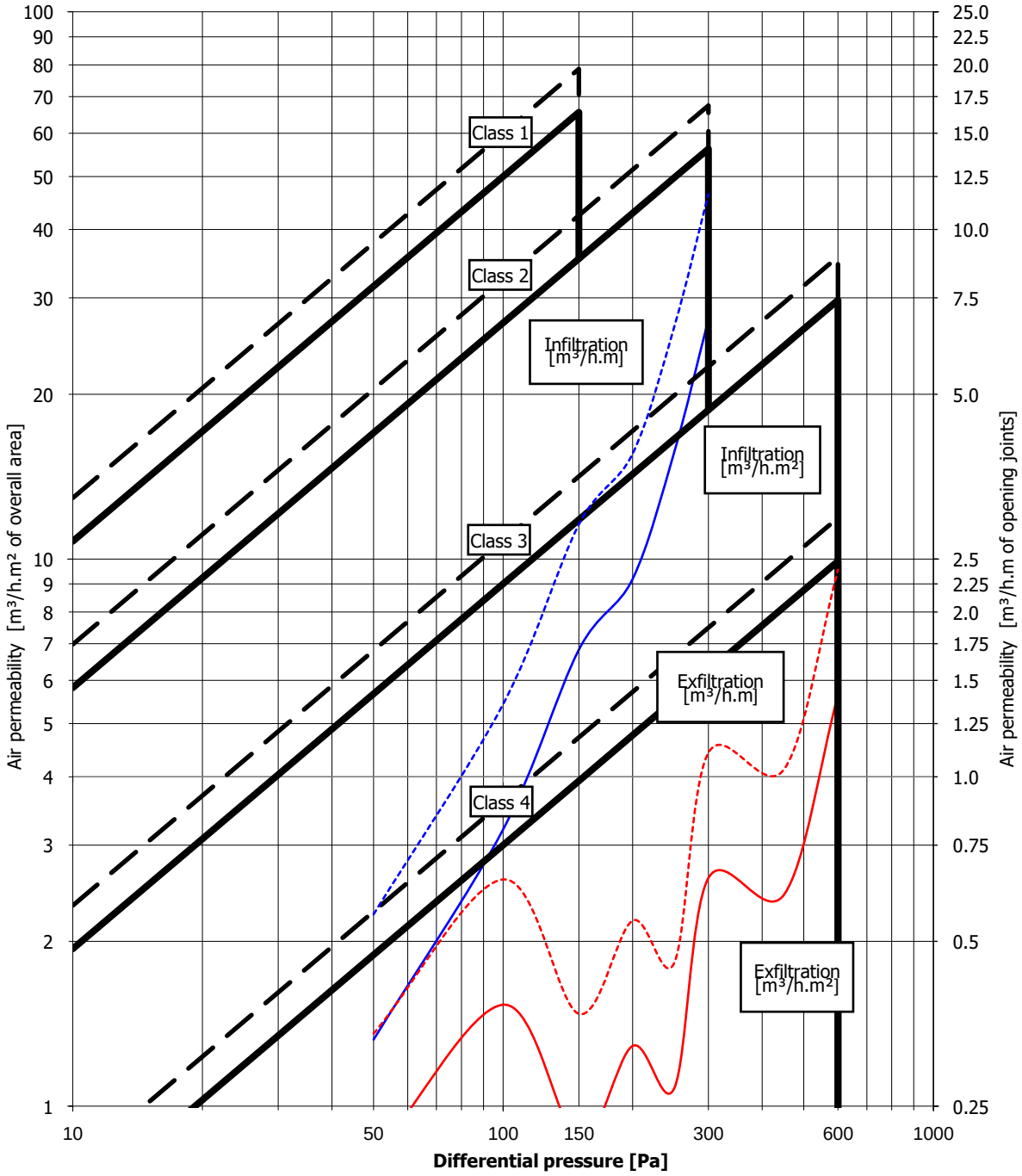


Table of Air Permeability After Gusting. (Sample 4)

AIR PERMEABILITY TEST RESULTS - BS EN 1026:2000 / BS EN 12207:2000

Three positive pressure pulses of 660Pa were applied prior to testing

Air Pressure [Pa]	Blank reading [m³/h]	Maximum total air flow [m³/h]	Actual rate of air leakage [m³/h]	Maximum rate of air leakage per meter length of opening joint [m³/h.m]	Maximum rate of air leakage relative to area of sample [m³/h.m²]
50	10.8	14.6	3.8	0.56	1.32
100	17.1	26.3	9.2	1.36	3.20
150	20.1	39.7	19.7	2.89	6.82
200	24.6	51.0	26.5	3.89	9.19
250	29.4	74.5	45.2	6.65	15.70
300	21.7	100.4	78.9	11.61	27.40
-50	9.3	11.6	2.3	0.34	0.80
-100	12.7	17.1	4.4	0.65	1.53
-150	16.8	19.3	2.5	0.37	0.87
-200	19.8	23.5	3.7	0.55	1.29
-250	22.5	25.6	3.1	0.46	1.08
-300	24.9	32.4	7.5	1.11	2.61
-450	37.1	44.1	7.0	1.03	2.44
-600	57.6	73.8	16.2	2.39	5.64

Total opening perimeter = 6.8m

Overall area = 2.88m²

Graph of Average Air Permeability After Gusting.

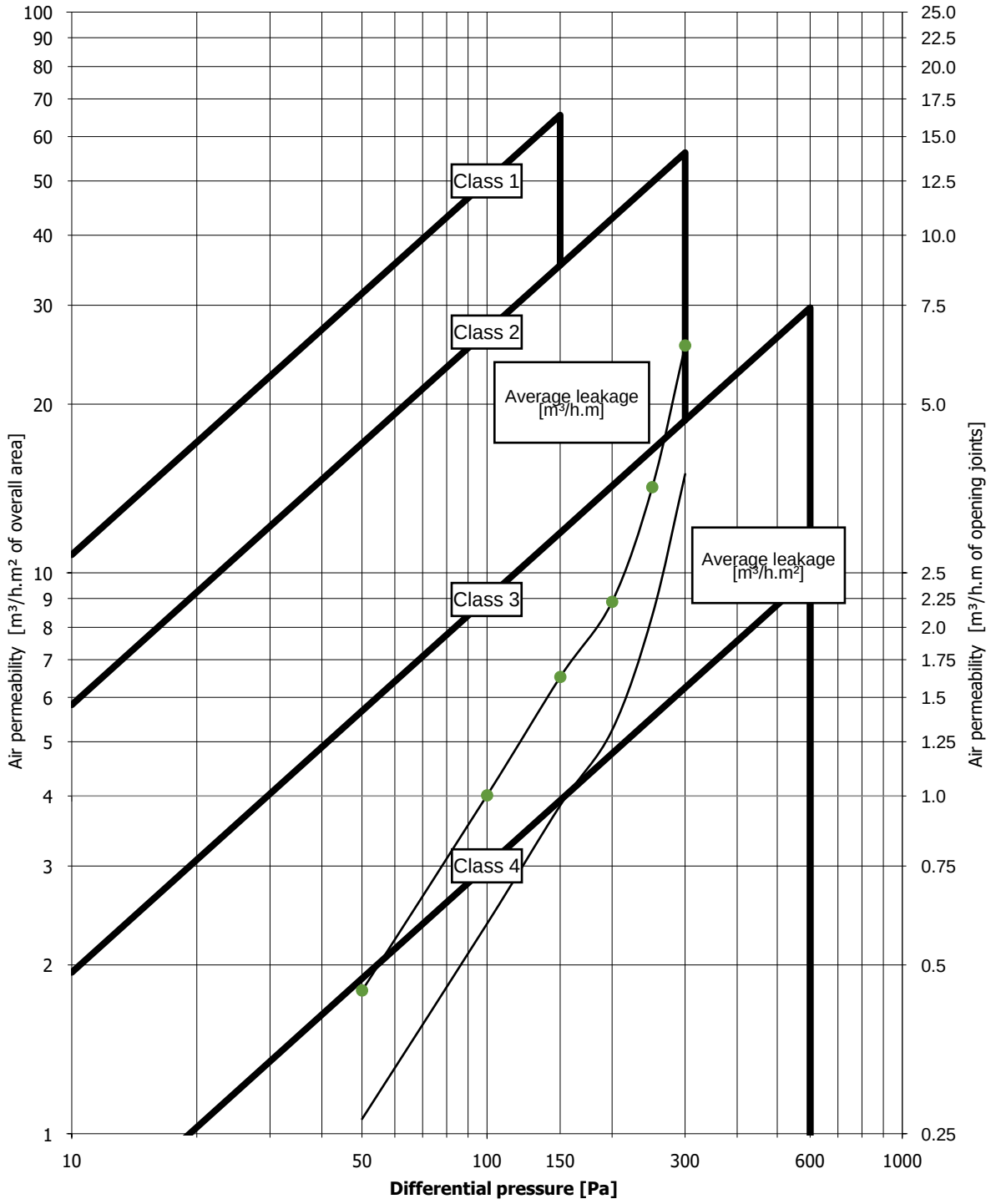


Table of Average Air Permeability After Gusting.

AIR PERMEABILITY TEST RESULTS - BS 6375-1:2015 / BS EN 1026:2000

Three positive pressure pulses of 660Pa were applied prior to testing

Air Pressure [Pa]	Average rate of air leakage [m³/h]	Average rate of air leakage per meter length of opening joint [m³/h.m]	Average rate of air leakage relative to area of sample [m³/h.m²]
50	3.1	0.45	1.06
100	6.8	1.00	2.37
150	11.1	1.63	3.85
200	15.1	2.22	5.24
250	24.2	3.55	8.39
300	43.2	6.36	15.01

Note: The figures in the table above give the leakage as an average of the leakage at positive pressure and the leakage at negative pressure

Total opening perimeter = 6.8m

Overall area = 2.88m²

BS 6375-1:2015 Clause 6.5 - Joint class = 2

BS 6375-1:2015 Clause 6.5 - Area class = 2

BS 6375-1:2015 Clause 6.5 - Overall class = 2

PAS24:2016 Type Test. (Sample 4)

1 off single leaf doorset with a low threshold and bonded glazing

(Sample ID No 10184008)

Date sample received: 23 January 2020

Test Results.

1.	Manipulation	The test sample met the requirements of the Specification in respect of B.4.3
2.	Infill Removal	The test sample met the requirements of the Specification in respect of B.4.4
3.	Mechanical Loading	The test sample met the requirements of the Specification in respect of B.4.5
4.	Soft Body Impact	The test sample met the requirements of the Specification in respect of B.4.8
5.	Hard Body Impact	The test sample met the requirements of the Specification in respect of B.4.9.2.2
6.	Security Hardware and Cylinder Test	The test sample met the requirements of the Specification in respect of Annex A
7.	Manual Check Test	The test sample met the requirements of the Specification in respect of B.4.6

B.2 Sample Selection.

The sample submitted for tests was selected using the criteria in B.2 of the Specification.
The sample was submitted for test mounted in a 75mm x 100mm timber subframe in accordance with the manufacturer's
installation requirements. The test sample was manufactured by the client.

The results within this test report are valid only for the conditions under which the testing was carried out, and only for the specified products.

B.3 Requirements for Test Apparatus.

The test apparatus for the manual and mechanical tests is shown in figures B.2 to B.5.

B.4 Test Methods.

The method of testing the sample followed the sequence detailed in B.4 of the Specification.

Description of Sample 4 (modern low threshold)

Sample Type -	Single leaf open in doorset with a low threshold and bonded glazing		
Material -	Aluminium		
Construction -	Mechanically jointed		
Fittings -	A ten-point (ten dead bolts) MCM locking system, key lockable 3*ERA cylinder, three dog bolts and four lift off hinges		
Classification -	D		
Glass -	Double glazed 4-20-4mm laminated glass unit		
Panel -	Not applicable		
Glass Retention System -	Bonded glazing		
Sample dimensions -	Overall length: Active leaf length:	1200mm 1070mm	Height: 2400mm Height: 2330mm

Test Results.

Performance Requirements — Assessment

B.4.3 Manipulation Test A

The sample was mounted, vertically and square, in the test rig as described in B.3.1.

The test was carried out with a perpendicular-to-plane load of 2.0kN applied to each corner of the glazing cassette.

No evidence of failure. No entry gained. — Pass

Date of test – 23 January 2020
Test engineer(s) – E Creary & D Vinyard
Laboratory temperature – 21.6°C

B.4.4 Cutting and Infill Medium Removal Test

B.4.4.2 Infill Manual Test

The sample was mounted, vertically and square, in the test rig as described in B.3.1.

The test was carried out in accordance with the requirements of this Annex using the tools described in Group A and Group B where applicable.

A craft knife was used to attempt to remove the gasket around the glazing

No entry gained within three minutes. — Pass

Date of test – 23 January 2020
Test engineer(s) – E Creary & D Vinyard
Laboratory temperature – 21.6°C

B.4.4.3 Infill Mechanical Test

The sample was mounted, vertically and square, in the test rig as described in B.3.1.

The test was carried out with a perpendicular-to-plane load of 2.0kN applied to each corner of the glazing cassette.

No evidence of failure. No entry gained. — Pass

Date of test – 23 January 2020
Test engineer(s) – E Creary & D Vinyard
Laboratory temperature – 21.6°C

Test Results. (continued)

Performance Requirements (continued) Assessment

B.4.4.4 Manual Cutting Test

The sample was mounted, vertically and square, in the test rig as described in B.3.1.

The test was carried out in accordance with the requirements of this Clause using the tools described.

A craft knife and 25mm chisel were used to attack the portion of the panel within Zone 1, the horizontal band with an upper limit of 400mm above the centre of rotation of the hardware unlocking point and a lower limit of 400mm below the centre of rotation of the hardware unlocking point, for three minutes.

The same tools were then used to attack the portion of the panel which falls outside of Zone 1 (Zone 2) for a further three minutes.

Craft knife and chisel used to attack the skin of the door leaf.

No entry gained within the time allowed. Pass

Date of test – 23 January 2020
Test engineer(s) – E Creary & D Vinyard
Laboratory temperature – 21.6°C

Test Results (Continued).

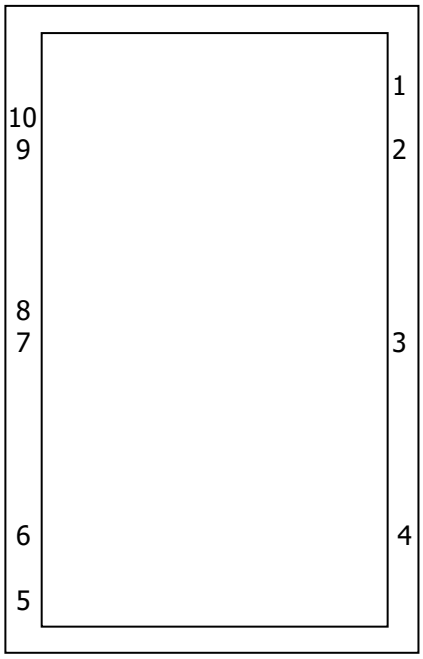
Performance Requirements (Continued).

B.4.5 Mechanical Loading Test

The sample was mounted, vertically and square, in the test rig.

The test was carried out in accordance with the procedures detailed in B.4.5, using loading cases B.1 to B.6 and Figures B.12 for loading sequence and using the test apparatus detailed in Figures B.6 to B.6.

Diagram of load points



B.4.5.2 Loading Procedure

First Sequence

1. Hinge / Dog Bolt (upper right jamb)

   Standard loading case used: 2 / 5

   Load applied in plane: 1.5kN along the edge in the direction to disengage the hinge
   Load applied perpendicular to plane: 4.5kN applied for ten seconds

   Load applied in plane: 1.5kN at right angles to the edge and towards the opposite edge
   Load applied perpendicular to plane: 4.5kN applied for ten seconds

Test Results (Continued).

B.4.5.2 Loading Procedure (continued)

First Sequence (continued)

2. Hinge (upper right jamb)

   Standard loading case used: 2

   Load applied in plane: 1.5kN along the edge in the direction to disengage the hinge
   Load applied perpendicular to plane: 4.5kN applied for ten seconds

   Load applied in plane: 1.5kN at right angles to the edge and towards the opposite edge
   Load applied perpendicular to plane: 4.5kN applied for ten seconds

3. Hinge / Dog Bolt (centre right jamb)

   Standard loading case used: 2 / 5

   Load applied in plane: 1.5kN along the edge in the direction to disengage the hinge
   Load applied perpendicular to plane: 4.5kN applied for ten seconds

   Load applied in plane: 1.5kN at right angles to the edge and towards the opposite edge
   Load applied perpendicular to plane: 4.5kN applied for ten seconds

4. Hinge / Dog Bolt (lower right jamb)

   Standard loading case used: 2 / 5

   Load applied in plane: 1.5kN along the edge in the direction to disengage the hinge
   Load applied perpendicular to plane: 4.5kN applied for ten seconds

   Load applied in plane: 1.5kN at right angles to the edge and towards the opposite edge
   Load applied perpendicular to plane: 4.5kN applied for ten seconds

5. Dead Bolt / Dead Bolt (lower left jamb)

   Standard loading case used: 3

   Load applied in plane: 1.5kN at right angles to the edge and towards the opposite edge
   Load applied perpendicular to plane: 4.5kN applied for ten seconds

Test Results (Continued).

Performance Requirements (Continued). Assessment

B.4.5.2 Loading Procedure (continued)

First Sequence (continued)

6. Dead Bolt (lower left jamb)

   Standard loading case used: 3

   Load applied in plane: 1.5kN at right angles to the edge and towards the opposite edge
   Load applied perpendicular to plane: 4.5kN applied for ten seconds

7. Dead Bolt / Dead Bolt (centre left jamb)

   Standard loading case used: 3

   Load applied in plane: 1.5kN at right angles to the edge and towards the opposite edge
   Load applied perpendicular to plane: 4.5kN applied for ten seconds

8. Dead Bolt (centre left jamb)

   Standard loading case used: 3

   Load applied in plane: 1.5kN at right angles to the edge and towards the opposite edge
   Load applied perpendicular to plane: 4.5kN applied for ten seconds

9. Dead Bolt / Dead Bolt (upper left jamb)

   Standard loading case used: 3

   Load applied in plane: 1.5kN at right angles to the edge and towards the opposite edge
   Load applied perpendicular to plane: 4.5kN applied for ten seconds

10. Dead Bolt (upper left jamb)

    Standard loading case used: 3

    Load applied in plane: 1.5kN at right angles to the edge and towards the opposite edge
    Load applied perpendicular to plane: 4.5kN applied for ten seconds

    No entry gained Pass

Date of test – 23 January 2020
Test engineer(s) – E Creary & D Vinyard
Laboratory temperature – 21.6°C

Test Results (Continued).

Performance Requirements (Continued).	Assessment
B.4.3 Manipulation Test B	
No fixings were exposed during mechanical loading.	Pass

Date of test – 23 January 2020
Test engineer(s) – E Creary & D Vinyard
Laboratory temperature – 21.6°C

Test Results (Continued).

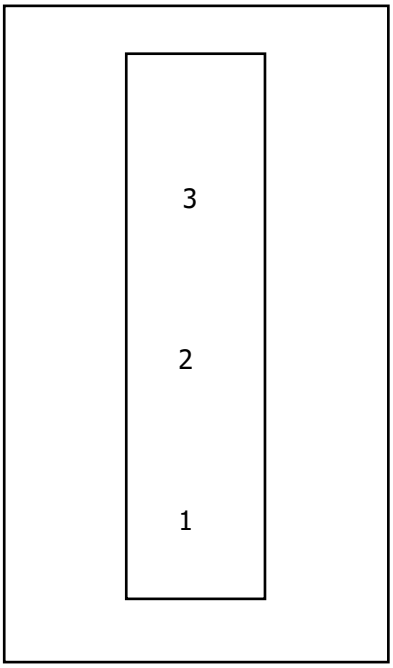
Assessment

B.4.8 Soft Body Impact Test

The sample was mounted, vertically and square, in the test rig as described in B.3.1

The test was carried out in accordance with the requirements, objectives and procedures detailed in B.4.8.1 using the impact points and procedure described in B.4.8.2 and B.4.8.3 and Figure B.10.

Diagram of impact points



Impact Point	Height from Floor Level	Effect
1	0.8m	None
2	1.25m	None
3	1.7m	None

No entry gained

Pass

Date of test – 23 January 2020
Test engineer(s) – E Creary & D Vinyard
Laboratory temperature – 21.6°C

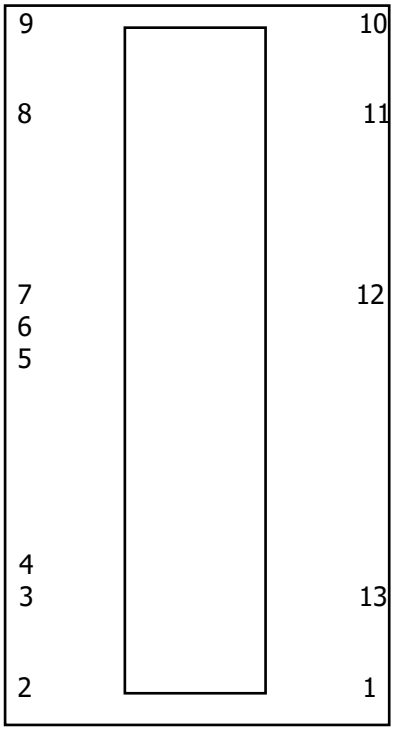
Test Results (Continued).

B.4.9 Hard Body Impact Test

The sample was mounted, vertically and square, in the test rig as described in B.3.1.

The test was carried out in accordance with the requirements, objectives and procedures detailed in B.4.9.1, B.4.9.2.1, B.4.9.2.2 and B.4.9.2.3 using procedure B.4.9.3, using the test apparatus detailed in B.11 and using the impact sequence in figure B.14.

Diagram of impact points



Test Results (Continued).

Performance Requirements (Continued). Assessment

Clause B.4.9 Hard Body Impact Test (continued)

Impact Point	Position	Effect
1	Corner	None
2	Corner	None
3	Dead/Dead	None
4	Dead	None
5	Dead/Dead	None
6	Cylinder	None
7	Dead	None
8	Dead/Dead	None
9	Corner	None
10	Hinge/Corner	None
11	Hinge/Dog Bolt	None
12	Hinge/Dog Bolt	None
13	Hinge/Dog Bolt	None

No entry gained Pass

Date of test – 23 January 2020
Test engineer(s) – E Creary & D Vinyard
Laboratory temperature – 21.6°C

Test Results (Continued).

Performance Requirements (continued) Assessment

B.4.6 Manual Check Test

The sample was mounted, vertically and square, in the test rig as described in B.3.1.

The test was carried out in accordance with the given objectives of this clause using the procedure detailed in B.4.6.3 and the tools described in B.4.6.2.

No one technique was used for more than 3 minutes.

No alternative method of entry could be found.

Date of test – 23 January 2020
Test engineer(s) – E Creary & D Vinyard
Laboratory temperature – 21.6°C

B.4.7 Additional Mechanical Loading Test

Not applicable

B.4.3 Letter Plates

None fitted

Test Results (Continued).

Performance Requirements (Continued).

Annex A Security Hardware and Cylinder Test — Assessment

Annex A.3.2 (Part 1)

The sample was mounted, vertically and square, in the test rig as described in Clause 3.1.

The test was carried out in accordance with the given objectives of this Annex using the procedure detailed in Annex A.3.1 and the tools described in A.2.

Unable to remove the escutcheon plate.

No entry gained within three minutes. — Pass

Date of test – 23 January 2020
Test engineer(s) – E Creary & D Vinyard
Laboratory temperature – 21.6°C

Annex A.3.2 (Part 2)

The sample was mounted, vertically and square, in the test rig as described in Clause 3.1.

The test was carried out in accordance with the given objectives of this Annex using the procedure detailed in Annex A.3.1 and the tools described in A.2.

Unable to insert the traction screw.

No entry gained within three minutes. — Pass

Date of test – 23 January 2020
Test engineer(s) – E Creary & D Vinyard
Laboratory temperature – 21.6°C

Test Sample

Sample Id	ER Number	Description
1	10184008	Aluminium doors

Description of Test Samples.

Sample Description
1 off single leaf open in cassette glazed doorset with glass infill above the midrail and a standard threshold
1 off single leaf open in cassette glazed doorset with a low threshold
1 off single leaf doorset with a standard threshold and bonded glazing
1 off single leaf doorset with a low threshold and bonded glazing

Test Requirements.

PAS24 direct testing

Clause	Requirements
Results table	PAS24 direct testing

Glossary of Terms.

PASS: Complies. Tested by BSI engineers at BSI laboratories.

PASS1: Complies. Witnessed by BSI engineers in manufacturers laboratory.

PASS2: Complies. Tests carried out by third party lab; results accepted by BSI.

PASS*: Report resulted in uncertainty and states that Compliance is more probable than non-compliance.

FAIL: Non compliance – Product does not meet the requirements of this clause.

FAIL*: Report resulted in uncertainty and states that Non-compliance is more probable than compliance.

N/A: Not applicable to design under consideration.

N/T: Not tested due to similarity to previously tested item; reference earlier test report.

Conditions of Issue.

This Test Report is issued subject to the conditions stated in current issue of 'BSI Terms of Service'. The results contained herein apply only to the particular sample(s) tested and to the specific tests carried out, as detailed in this Test Report. The issuing of this Test Report does not indicate any measure of Approval, Certification, Supervision, Control or Surveillance by BSI of any product. No extract, abridgement or abstraction from a Test Report may be published or used to advertise a product without the written consent of BSI, who reserve the absolute right to agree or reject all or any of the details of any items or publicity for which consent may be sought.

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