Test Report

Report No	2370/8083771	This Report consists of 15 pages
Licence/Certificate No	KM 90215	
Client	Sapa Building Systems Limited Severn Drive Northway Industrial Estate Tewkesbury GL20 8TX	
Authority & date	Service Management Order No - 8083771 Equipment Record No 10144876	
Items tested	1 off double leaf patio door door, Crown Fold Aluminium Alloy Residential Door System	
Specification	BS 4873:2009 - Aluminium windows and doorsets BS 6375-1:2009 Performance of windows and doors Part 1: Classification for weathertightness and guidance on selection and specification Type testing for Product Certification	
Results	Se summary of results on page 2	
Prepared by	D Kirsop	(Senior Technician)
Authorized by	M Manito	(Senior Engineer)
Issue Date		
Conditions of issue	This Test Report is issued subject to the conditions stated in current issue of *CP0322 'Conditions of contract for testing'*. 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 the Managing Director, BSI, who reserves the absolute right to agree or reject all or any of the details of any items or publicity for which consent may be sought.	

TEST AND EXAMINATION OF ONE DOUBLE LEAF PATIO DOOR SUBMITTED FOR TYPE ASSESSMENT, CROWN FOLD RESIDENTIAL ALUMINIUM ALLOY DOOR SYSTEM

INTRODUCTION

The Aluminium alloy door submitted by Sapa Building Systems Limited, was tested and assessed to the requirements of BS4873:2009 and BS 6375-1:2009, as indicated on the following pages 5 and 6 of this Report.
This request was made on Service Management Order No 8083771.
It is emphasized that assessments have not been made against the other Clauses of the Specification.

TEST SAMPLE

1 off double leaf patio door, open out glaze in hinged door assembly with full glass infill and standard threshold

(Equipment Record No: 10144876)

Date samples received: 27 November 2013

SUMMARY OF RESULTS

1.	Air permeability	The test sample met the requirements of the Specification, in respect of Clause 6, for Test Pressure Class 4.
2.	Watertightness	The test sample met the requirements of the Specification, in respect of Clause 7, for Test Pressure Class 8A.
2.	Wind	The test sample met the requirements of the Specification, in respect of Clause 8, for Test Pressure Class A3.

Classification for Wind Resistance

Test sample 1	Exposure Category 1200Pa

SAMPLE SELECTION

The samples submitted for tests were selected using the PCP 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.

CLAUSE 5 SEQUENCE OF TESTS

The sequence of testing the samples followed that detailed in Clause 5 of BS6375-1:2009.

CLAUSE 5 PERFORMANCE REQUIREMENTS

The performance of each sample was assessed against the requirements detailed in Table 1 Exposure categories and classifications

PREPARATION AND METHOD OF TEST

The samples were prepared as required by BS EN 1026:2000 Windows and doors - Air permeability, BS EN 1027:2000 Windows and doors - Watertightness and BS EN 12211:2000 Windows and doors - Resistance to wind load in respect of BS 6375 -1:2009.
The samples were mounted into a plywood surround for installation in the test apparatus.
The joint between the samples and the plywood surround was sealed.

1. Air Permeability

The air permeability of the sample was determined by the method given in BS 6375-1:2009.

2. Watertightness

The watertightness of the sample was determined by the method given in BS 6375-1:2009.

3. Wind Resistance

The wind resistance of the samples was determined by the methods (P1 and P2) given in BS 6375-1:2009.

4. Repeat Tests

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

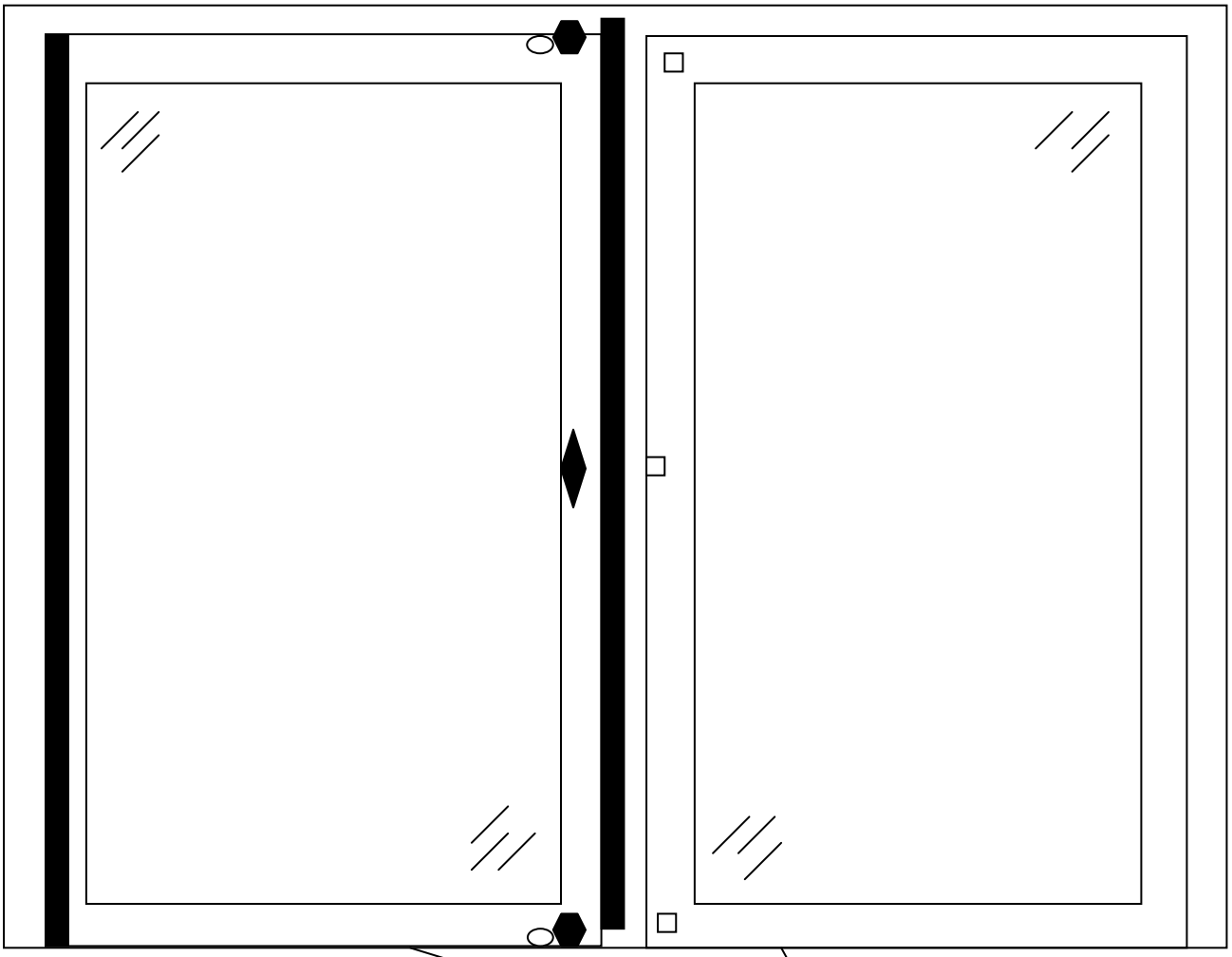
5. Wind Resistance

The wind resistance of the samples was determined by the method (P3) given in BS 6375-1:2009.

DESCRIPTION OF SAMPLE

Sample type -	A double leaf glaze in bi-fold door with full glass infill and standard threshold
Material -	Aluminium alloy
Finish -	Natural
Fittings -	A two point locking (two shootbolts) system, cylinder, key locking handle and two pin hinges.
Weathersealing -	Double sided plastics
Glass -	Double glazed with 4-20-4 mm toughened glass sealed units
Glass retention system -	Internal beads and gaskets
Sample dimensions -	Overall - Length: 2200mm Height: 2640mm Each Leaf - Length: 1020mm Height: 2450mm
Date of test -	28 November 2013 - conducted by A Pearce
Laboratory temperature -	18.6°C
Laboratory humidity -	47.7%
Laboratory pressure -	102.1kPa

ELEVATION DRAWING INDICATING POSITION OF HARDWARE



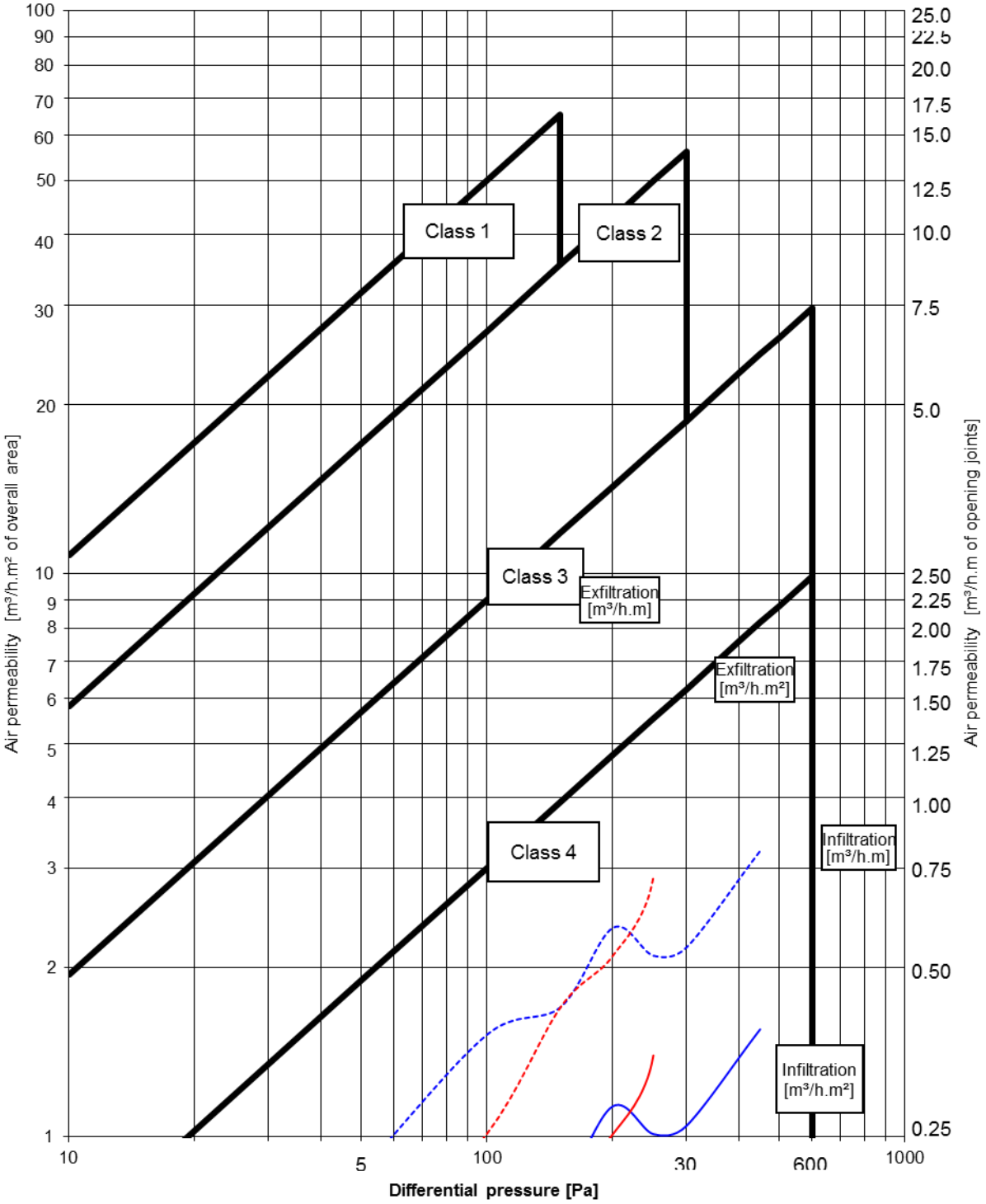
- continues hinge

water leakage

-

- handle, lockcase and cylinder
- transducer
- roller
- handle for sliding leaves

GRAPH OF AIR PERMEABILITY BEFORE GUSTING



AIR PERMEABILITY TEST RESULTS - BS 6375-1:2009 Clause 6 / BS EN 1026:2000

Clause 6

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

Table 4

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	2.0	0.18	0.35
100	3.5	0.32	0.61
150	4.8	0.42	0.82
200	6.2	0.56	1.07
250	7.0	0.62	1.20
300	20.1	1.79	3.46
450	-	-	-
600	-	-	-

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 = 11.2m

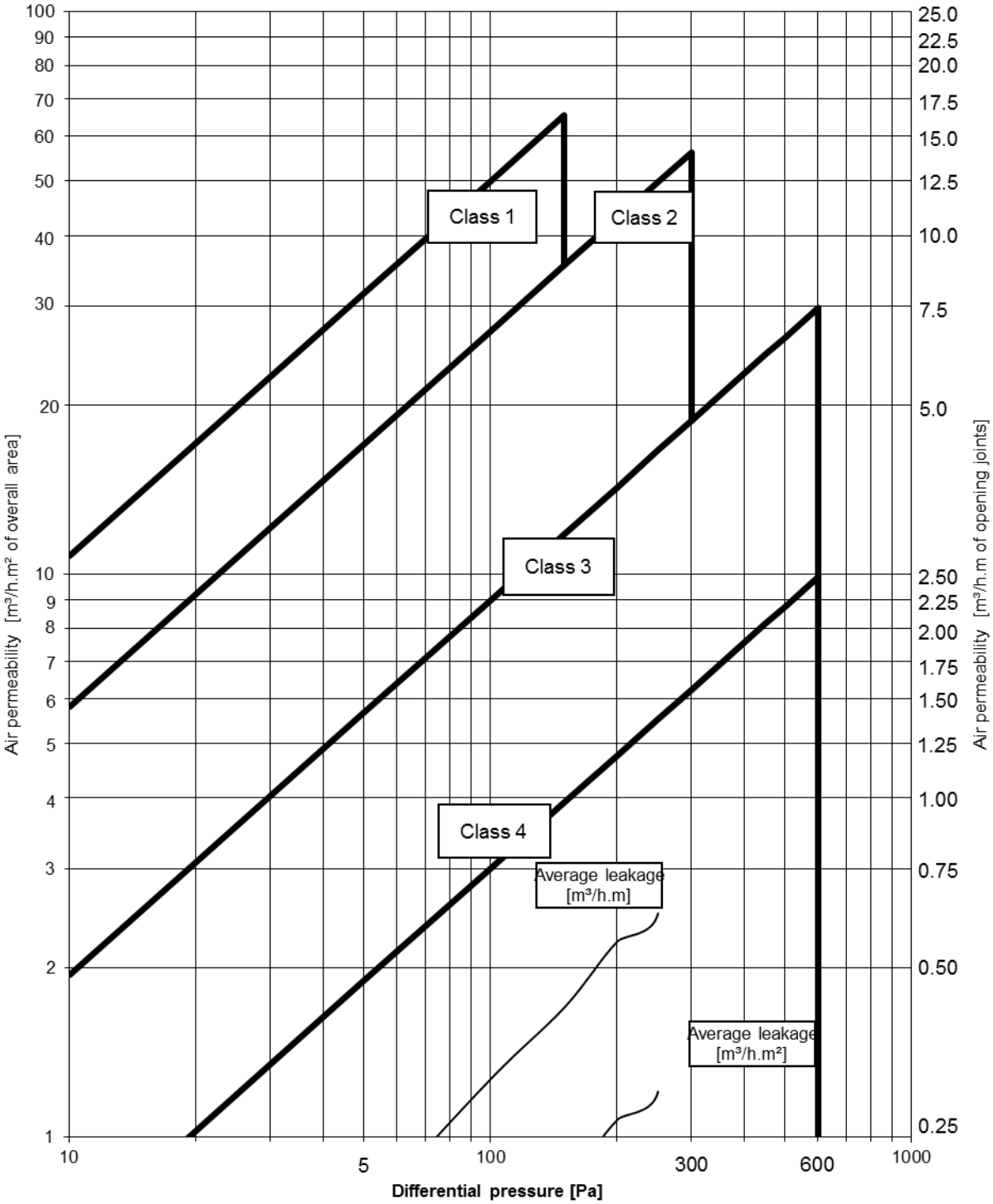
Overall area = 5.808m²

BS 6375-1:2009 Clause 6.2 - Joint class = 3

BS 6375-1:2009 Clause 6.2 - Area class = 4

BS 6375-1:2009 Clause 6.2 - Overall class = 4

GRAPH OF AVERAGE AIR PERMEABILITY BEFORE GUSTING



WATERTIGHTNESS TEST RESULTS - BS EN 1027:2000

Clause 7 Watertightness before resistance to wind loads

FIGURE 1 - Spraying method 1A (Test Method BS EN 1027)

Pressure (Pa)	Point at which water leakage occurred
600	Water ran out and over the threshold from the glazing bead joint

WIND RESISTANCE TEST RESULTS - BS EN 12211:2000

Clause 8 Resistance to wind load

P1 DEFLECTION TEST

Three positive pressure pulses at 1320Pa were applied

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

Actual deflection – 9.22mm (maximum deflection allowed 16.13mm)

Deflection/span ratio 1/254 (maximum ratio allowed 1/150)

Three negative pressure pulses at 1320Pa were applied

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

Actual deflection – 9.51mm (maximum deflection allowed 16.13mm)

Deflection/span ratio 1/406 (maximum ratio allowed 1/150)

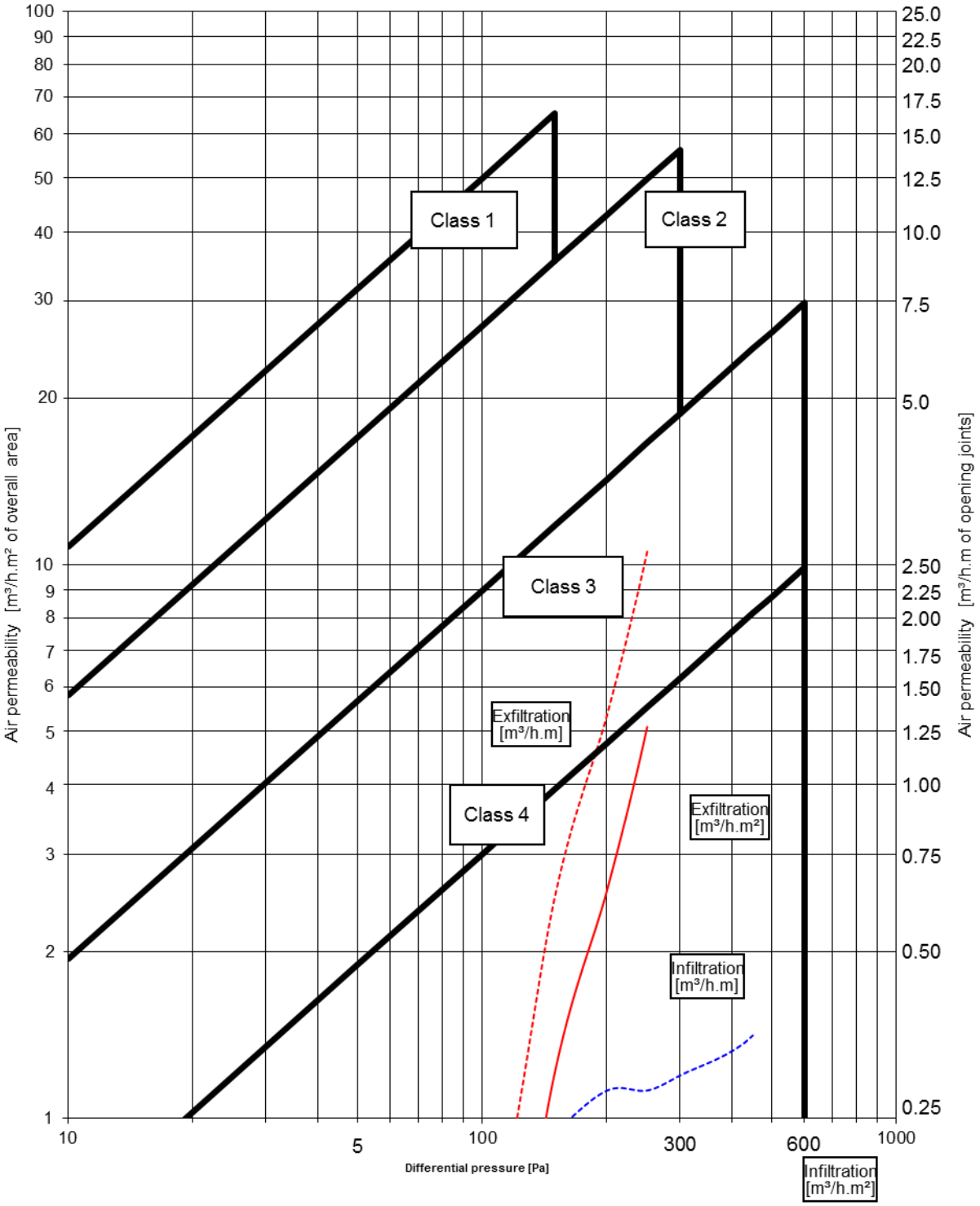
P2 REPEATED PRESSURE TEST

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

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

In accordance with BS 6375-1:2009 Clause 6.5, as the classification after the resistance to wind load tests is the same as the classification before the resistance to wind load tests, the resulting classification for the sample is Class 4.
(see following Table).

GRAPH OF AIR PERMEABILITY AFTER GUSTING



AIR PERMEABILITY TEST RESULTS - BS 6375-1:2009 Clause 6 / BS EN 1026:2000

Clause 6 After resistance to wind tests

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

Table 4

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	0.3	0.03	0.05
100	1.7	0.15	0.29
150	4.9	0.43	0.84
200	9.1	0.81	1.56
250	16.4	1.46	2.82
300	32.0	2.85	5.50
450	-	-	-
600	-	-	-

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 = 11.2m

Overall area = 5.808m²

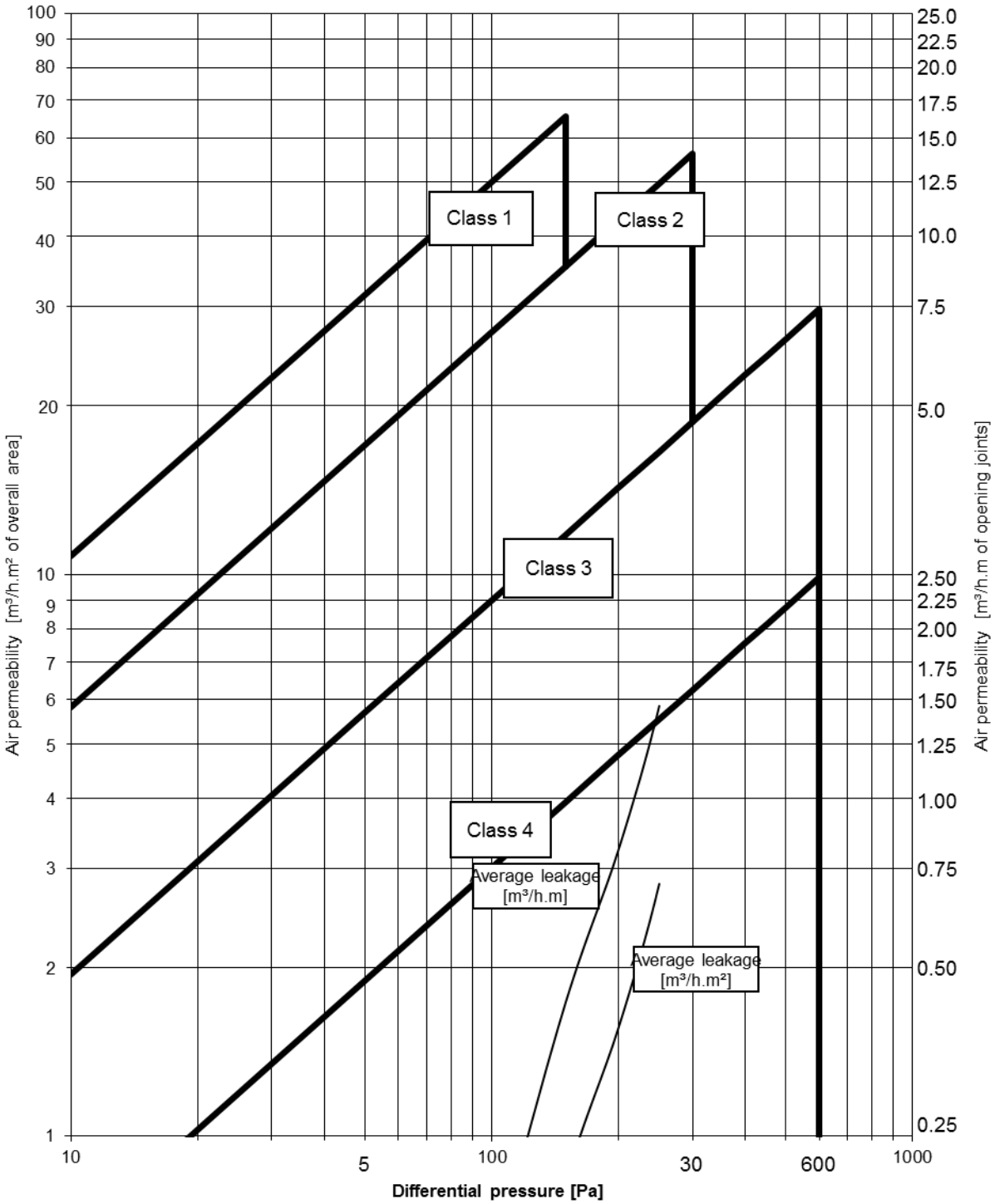
BS 6375-1:2009 Clause 6.5 - Joint class = 3

BS 6375-1:2009 Clause 6.5 - Area class = 4

BS 6375-1:2009 Clause 6.5 - Overall class = 4

In accordance with BS 6375-1:2009 Clause 6.5, as the classification after the resistance to wind load tests is the same as the classification before the resistance to wind load tests, the resulting classification for the sample is Class 4.

GRAPH OF AVERAGE AIR PERMEABILITY AFTER GUSTING



WIND RESISTANCE TEST RESULTS - BS EN 12211:2004

P3 SAFETY TEST

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

Photo of sample

END OF REPORT