

ZHEJIANG TOFINE COMMERCIAL AND TRADE CO., LTD.

TEST REPORT

SCOPE OF WORK

Steel Door

REPORT NUMBER

200923003SHF-001

TEST DATE(S)

2020-12-18 - 2020-12-18

ISSUE DATE

2021-01-07

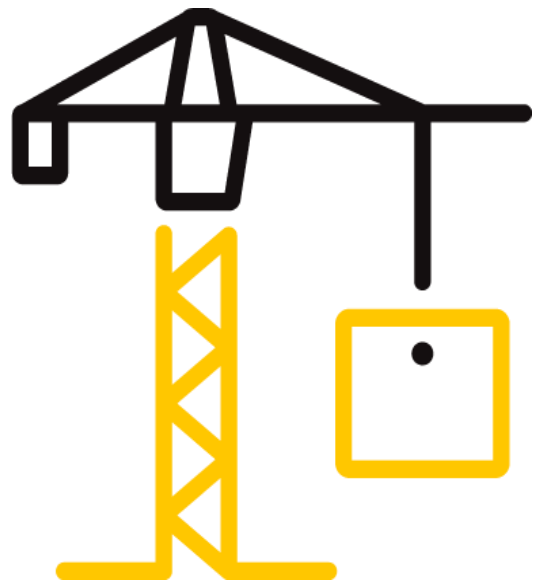
PAGES

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Test Report

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Applicant: ZHEJIANG TOFINE COMMERCIAL AND TRADE CO., LTD.
Applicant Address: Room23A01-19, Wanda Plaza Building 4#, JinhuaCity, Zhejiang Province, China
Attn: Anna

Sample information	
Product:	Steel Door
Trade Mark:	/
Model and/or type reference:	TCE-001
Manufacturer:	ZHEJIANG TOFINE COMMERCIAL AND TRADE CO., LTD.
Sample ID:	S200923003SHF.001
Date of receipt of test item:	2020-12-11
Date (s) of performance of tests:	2020-12-18~2020-12-18

Testing information	
Standard:	EN 14351:2006+A2:2016 Clauses 4.2, 4.5 and 4.14
Rating(s):	Not specified
Possible Test Case Verdicts	
Test Case does not apply to the Test object:	N/A
Test object does meet the requirement:	P (Pass)
Test object does not meet the requirement:	F (Fail)
The submitted samples were tested in accordance with specified standards, and listed the result accordingly, refer to text for detail.	

Report Authorized


Zac Zhang *Gio Liu*
Name: Zac Zhang Name: Gio Liu
Title: Reviewer Title: Project Engineer

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Test Items, Method and Results:

EN 14351-1:2006 + A2:2016			
Clause	Requirement	Result - Remark	Verdict
4.2	Resistance to wind load Tests on windows and external pedestrian doorsets shall be carried out in accordance with EN 12211. Classification according to EN 12210.	<p>Test pressures for: Class 4</p> <p>P1: 1600 Pa P2: 800 Pa P3: 2400 Pa</p> <p>Relative frontal deflection: Class C4</p> <p>After repeated pressure test and safety test, no significant damage happened, and the sample door was still operable. The test specimen remained closed.</p> <p>The air permeability after tests P1 and P2 did not exceed the upper limits of the claimed air permeability class (Class 2) as specified in EN 12207 by more than 20%.</p> <p>The test specimen meets the requirement of clause 6.1 of EN 12210</p> <p>Conclusion: Final classification C4</p> <p>The data of resistance to wind load can be referenced to Appendix C.</p>	Pass
4.5	Watertightness A watertightness test shall be carried out in accordance with EN 1027, Method 1A. Classification according to EN 12208.	<p>Non-shielded (A): Class 6A</p> <p>Water penetration: When water sprayed for 300 seconds at 250 Pa, there was no water penetration.</p> <p>The door drawing of watertightness can be referenced to Appendix C.</p>	Pass
4.14	Air permeability – before and after wind load Two air permeability tests shall be carried out in accordance with EN 1026, one with positive test pressures and one with negative test pressures. Classification according to EN 12207.	<p>Length of opening joint: 5.65 m Overall area: 1.97 m²</p> <p>Final classification of air permeability (After wind load): Class 2</p> <p>The data of air permeability can be referenced in Appendix C.</p>	Pass

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Appendix A: Product Drawings

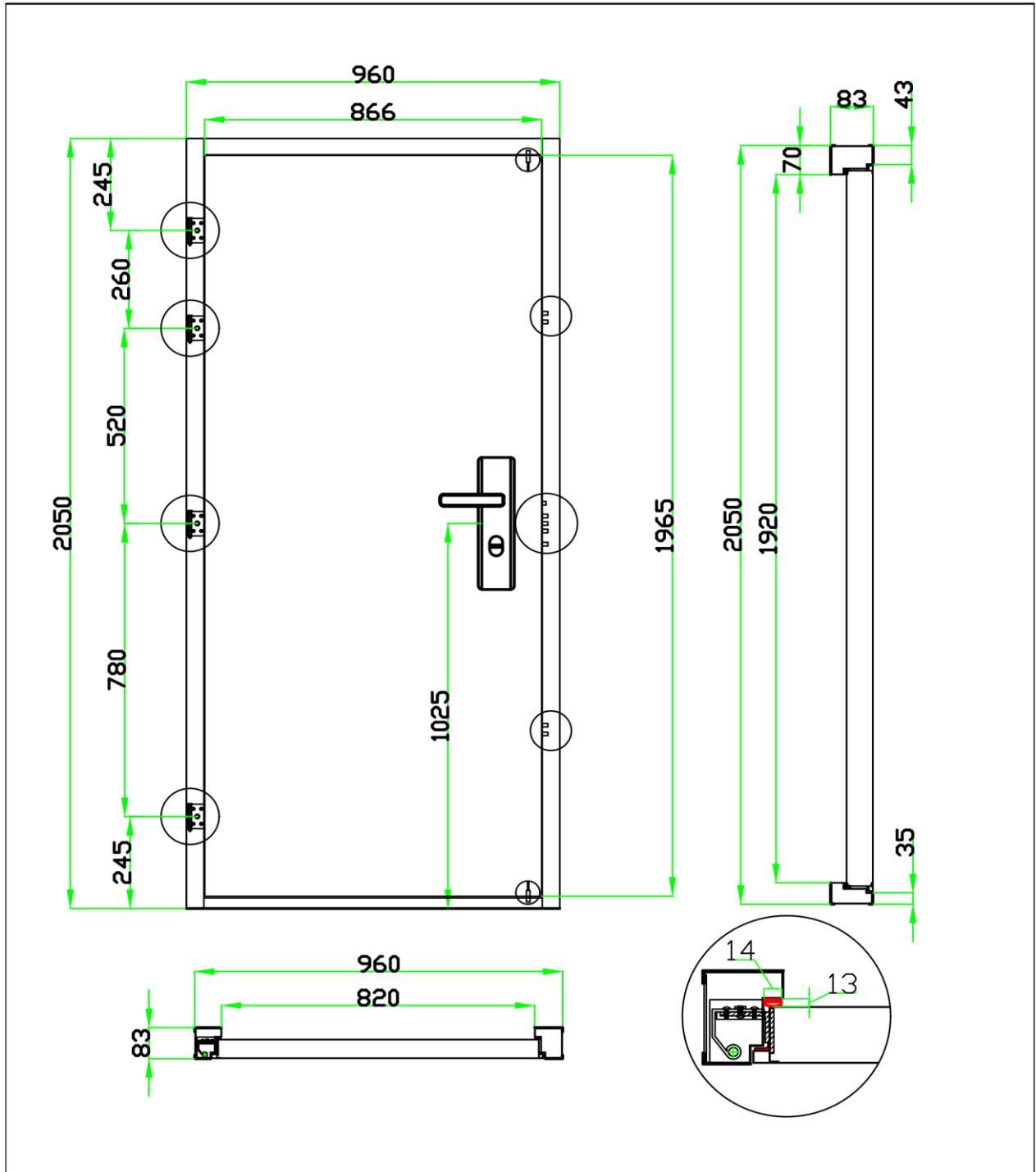


Fig.1 Drawing of Representative Sample

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Appendix B: Information about Representative Sample supplied by manufacturer

2 Manufacturer: Zhejiang Tofine Commercial And Trade Co., Ltd.		
3 Window (door) system name / construction type (window, door, casement door): Steel door, type: TCE-001, the way of opening: outward		
4 Specification of components and their manufacturing plans; fill in material and the manufacturer's marking		
- main profiles manufacturer, supplier: Zhejiang Tofine Commercial And Trade Co., Ltd.	marking: frame, sample (frame) dimensions TCE-001 B x H: 960mm x2050mm	marking: casement (leaf), casement (s) dimensions TCE-001 b x h: 866mm x1965 mm
- thermal break	Manufacturer, supplier, marking, thickness (mm) Not Applicable	Manufacturer, supplier, marking, thickness (mm) Not Applicable
- other profiles manufacturer, supplier: -	marking: false mullion + cover, mullions and transoms, glazing bars, threshold profiles, casement weather mouldings (casement water bars) Not Applicable	
- opening joint sealing (preformed gaskets, weather stripping) manufacturer, supplier: Wuyi Xingtai Rubber & Plastic Co., Ltd	marking: interior (internal) preformed gasket, design in the corners *13mmx14mm, Stick design in the corners: Cut	marking: central preformed gasket, design in the corners -
	marking: exterior (external) preformed gasket, design in the corners *13mmx14mm, Stick design in the corners: Cut	marking: threshold preformed gasket (wiping on the leaf) *13mmx14mm, Stick design in the corners: Cut
- sealing of glazing manufacturer, supplier: -	marking: external glazing, design in the corners* Not Applicable	marking: glazing bead and preformed gasket * Not Applicable
Insulating glass, infill manufacturer, supplier: -	marking and composition of the glazing and infills Not Applicable	
5 Draining and decompression of casement /glazing groove (rebate)/: (e.g. at the bottom of 3 openings (5x30 mm) input profile, 2 openings (5x28 mm) with cover output profile; top external preformed gasket is 2x interrupted in the same length of 50 mm). Not Applicable		
6 Draining and decompression of frame (opening joint): Not Applicable		
7 Building hardware (fittings) (type marking and manufacturer): Door Lock HY18-4-09		
Exit devices (bolts) (right, left casement, others): number of perimeter points, operating way, auxiliary thrusts, special points -		
Hinges 4 Pieces Zhejiang Jiabao Industry And Trade Co., Ltd.		
8 Frame joints design and additional notes: Not Applicable		
9 Notice: *design of preformed gaskets in the corners: continuously bent, slit (notched), cut and glued		
10 Date and place of elaborating (sampling), signature:	ANNA, 2020-12-12	

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Appendix C: Test Data Summary

1. Windows and doors – Air permeability – Test method EN 1026 – before wind load

- Length of opening joints: 5.65 m
- Overall area: 1.97 m²

Table 1

Air permeability at positive pressure	Test pressure step (Pa)	50	100	150	200	250	300	450	600
	Air permeability								
absolute (m ³ /h)		8.51	11.72	14.21	15.77	17.64	19.19	23.55	26.97
related to joints length (m ³ /hm)		1.51	2.07	2.52	2.79	3.12	3.40	4.17	4.77
related to overall area (m ³ /hm ²)		4.32	5.96	7.22	8.01	8.96	9.75	11.97	13.70

Table 2

Air permeability at negative pressure	Test pressure step (Pa)	50	100	150	200	250	300	450	600
	Air permeability								
absolute (m ³ /h)		9.96	16.39	22.30	28.42	35.06	42.53	70.44	102.60
related to joints length (m ³ /hm)		1.76	2.90	3.95	5.03	6.21	7.53	12.47	18.16
related to overall area (m ³ /hm ²)		5.06	8.33	11.33	14.44	17.82	21.61	35.79	52.13

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Table 3

	Test pressure step (Pa)	50	100	150	200	250	300	450	600
	Average air permeability	Air permeability							
	absolute (m ³ /h)	9.23	14.06	18.26	22.10	26.35	30.86	46.99	64.79
	related to joints length (m ³ /hm)	1.63	2.49	3.23	3.91	4.66	5.46	8.32	11.47
	related to overall area (m ³ /hm ²)	4.69	7.14	9.28	11.23	13.39	15.68	23.88	32.92

Table 4

Reference air permeability at 100 Pa related to joints length	Q ₁₀₀ = 2.49 m ³ /hm
Reference air permeability at 100 Pa related to overall area	Q ₁₀₀ = 7.14 m ³ /hm ²
Classification related to joints length (<i>with regard to pressure dependence of air permeability</i>) according to EN 12207	Class: 2
Classification related to overall area (<i>with regard to pressure dependence of air permeability</i>) according to EN 12207	Class: 2
Final classification of the test specimen according to EN 12207	Class: 2

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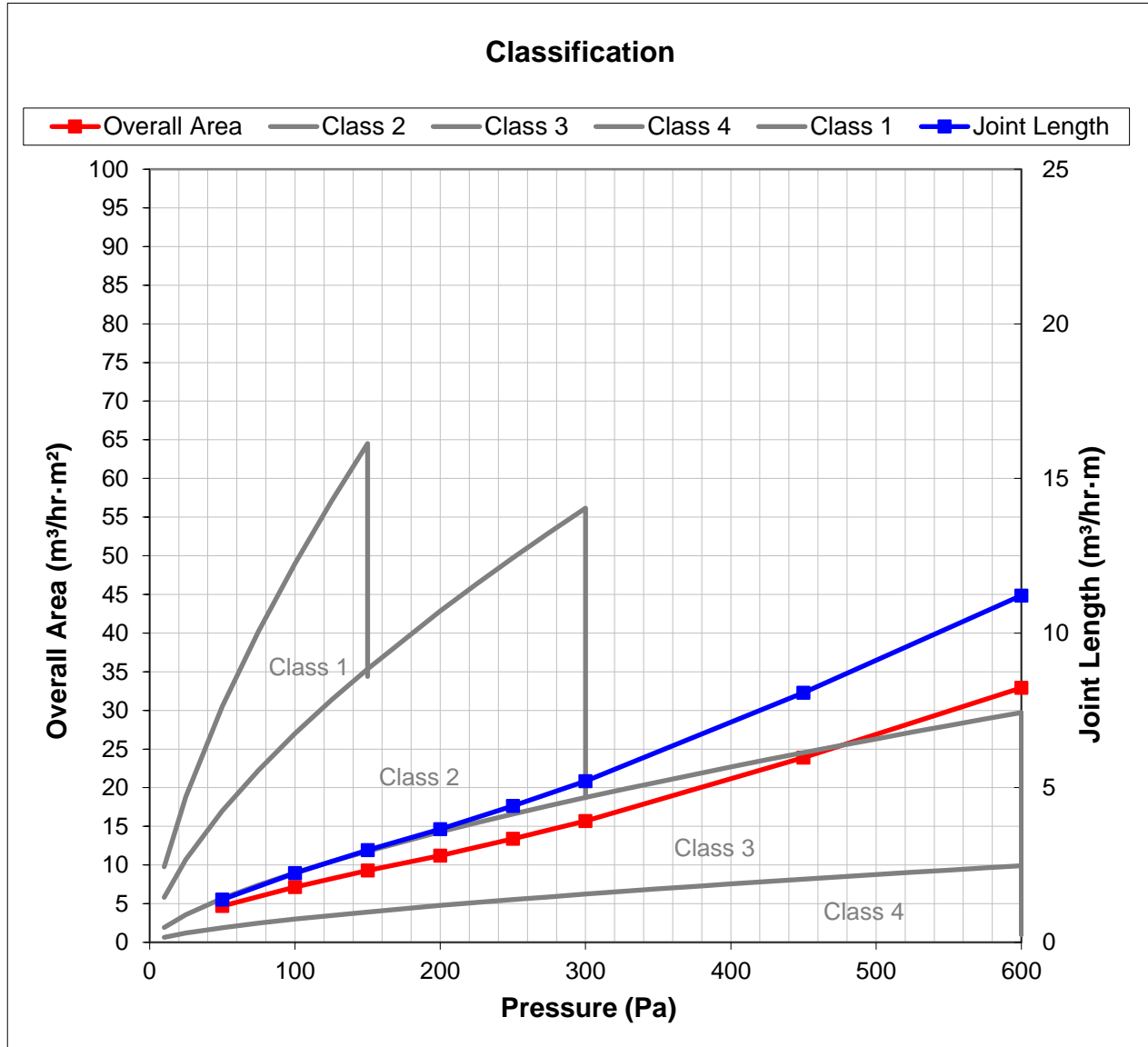
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Chart 1 - Air Permeability before Wind load



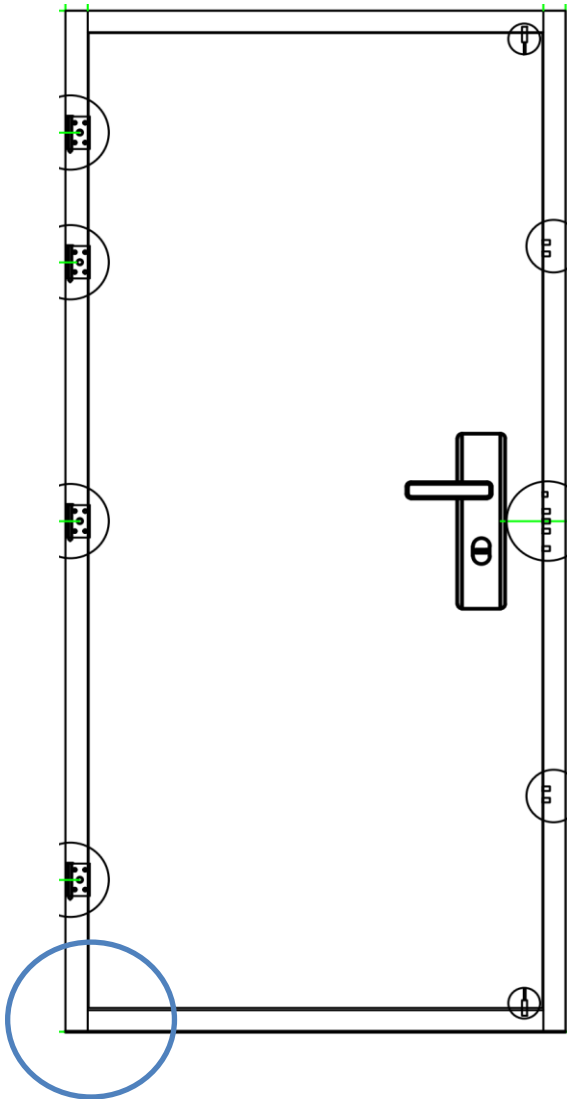
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2. Windows and doors – Watertightness – Test method EN 1027

Door Drawings



 : Water penetration position

Water penetration: When water sprayed for 240 seconds at 300 Pa, the water penetration started between door frame and door leaf.

Test result:

$P_{max} = 250 \text{ Pa}$

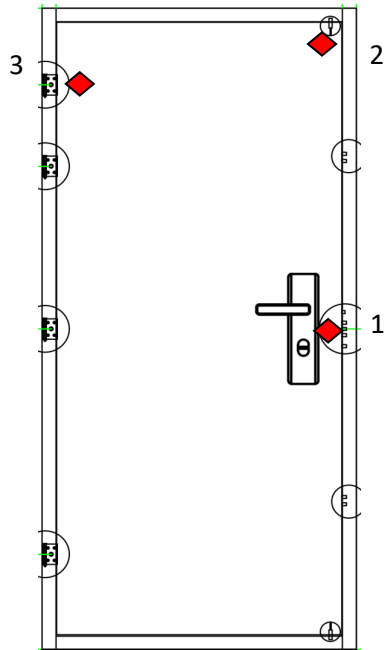
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3. Windows and doors –Resistance to wind load – Test method EN 12211

3.1 Deflection test



(1, 2, 3 are location of gauges)

Frame member length L1 = 980 mm
Frame member length L2 = 1350 mm
Frame member length L3 = 1350 mm

Table 5

Gauge No.	Frontal displacement (deflection) values (mm)							
	Positive pressure +P ₁	Zero pressure P ₀	Frontal deflection F _p (mm)	Relative frontal deflection F _{rp} = F _p /L	Negative pressure -P ₁	Zero pressure P ₀	Frontal deflection F _p (mm)	Relative frontal deflection F _{rp} = F _p /L
1	4.6	0.0	2.6	1/788	1.4	0.0	1.4	1/1436
2	5.6	0.0			3.1	0.1		
3	1.5	0.0			1.7	0.0		

3.2 Repeated pressure test

50 cycles of negative and positive pressure P2 = 0.5 × P1= 800 Pa

Test Result:

No significant damage happened, and the sample was still operable.

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3.3 Windows and doors – Air permeability – Test method EN 1026 – after wind load

- Length of opening joints: 5.65 m
- Overall area: 1.97 m²

Table 6

Air permeability at positive pressure	Test pressure step (Pa)	50	100	150	200	250	300	450	600
	Air permeability								
absolute (m ³ /h)		9.13	12.24	14.00	14.32	15.98	17.53	22.10	25.83
related to joints length (m ³ /hm)		1.62	2.17	2.48	2.53	2.83	3.10	3.91	4.57
related to overall area (m ³ /hm ²)		4.64	6.22	7.11	7.28	8.12	8.91	11.23	13.13

Table 7

Air permeability at negative pressure	Test pressure step (Pa)	50	100	150	200	250	300	450	600
	Air permeability								
absolute (m ³ /h)		12.45	20.33	27.39	34.75	42.74	51.66	85.38	121.89
related to joints length (m ³ /hm)		2.20	3.60	4.85	6.15	7.56	9.14	15.11	21.57
related to overall area (m ³ /hm ²)		6.33	10.33	13.92	17.66	21.72	26.25	43.38	61.94

Table 8

Average air permeability	Test pressure step (Pa)	50	100	150	200	250	300	450	600
	Air permeability								
absolute (m ³ /h)		10.79	16.29	20.70	24.53	29.36	34.60	53.74	73.86
related to joints length (m ³ /hm)		1.91	2.88	3.66	4.34	5.20	6.12	9.51	13.07
related to overall area (m ³ /hm ²)		5.48	8.28	10.52	12.46	14.92	17.58	27.31	37.53

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Table 9

Reference air permeability at 100 Pa related to joints length	$Q_{100} = 2.88 \text{ m}^3/\text{hm}$
Reference air permeability at 100 Pa related to overall area	$Q_{100} = 8.28 \text{ m}^3/\text{hm}^2$
The requirement for maximum air permeability (120% of upper limit value) at 100 Pa for the given class – Class 2 (after wind load) related to joints length	8.1 m^3/hm
The requirement for maximum air permeability (120% of upper limit value) at 100 Pa for the given class – Class 2 (after wind load) related to overall area	32.4 m^3/hm^2

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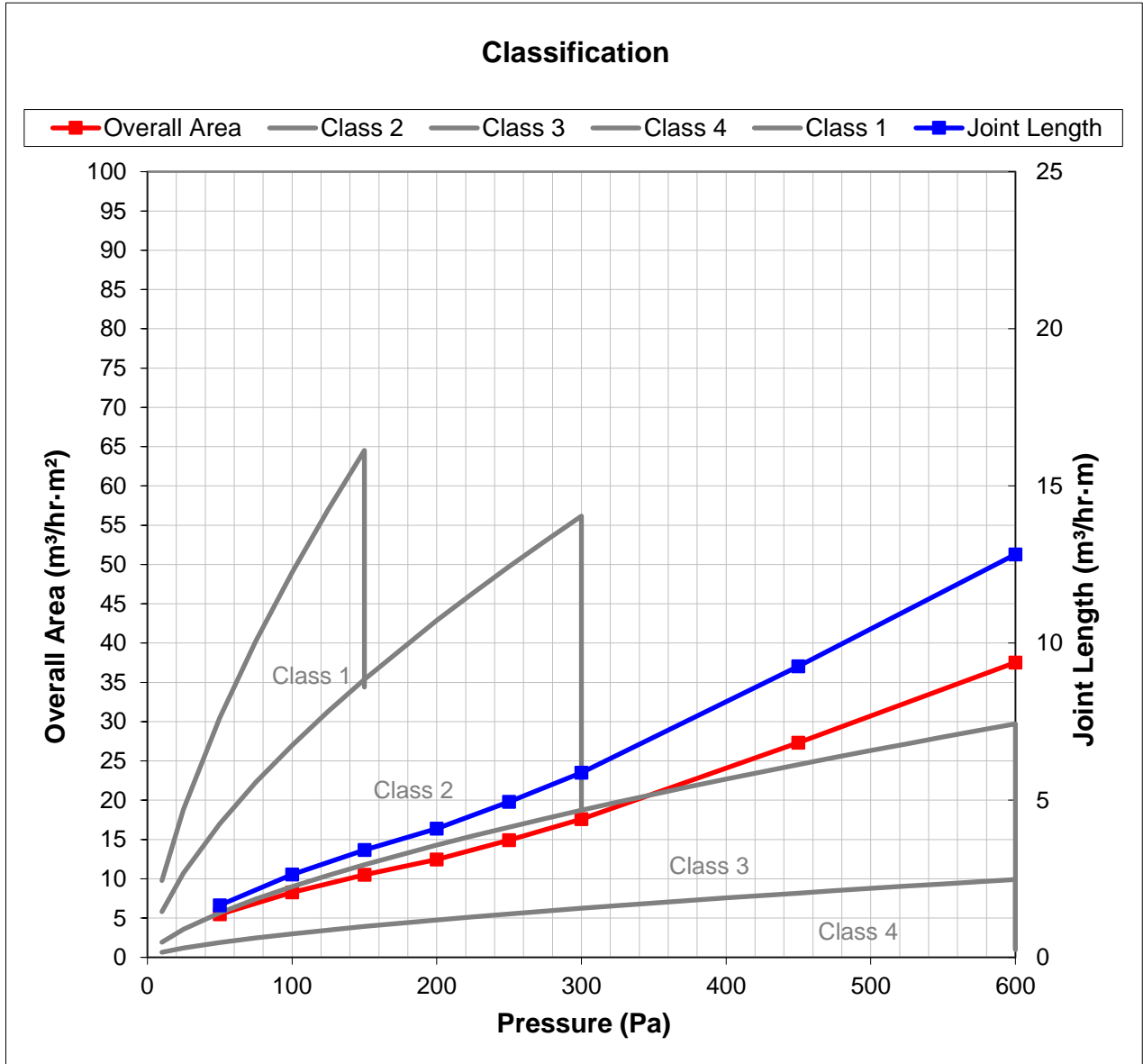
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Chart 2 - Air Permeability after Wind load



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3.4 Safety test

1 cycle including negative and positive test pressure $P3 = 1.5 \times P1 = 2400 \text{ Pa}$

Test results:

The test specimen remained closed, without any visible damage and failure or detachment any parts of the test specimen.

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Appendix D: Sample Received Photo



Revision:

NO.	DATE	CHANGES	AUTHOR	REVIEWER
200923003SHF-001	2021-01-07	First issue	Gio Liu	Zac Zhang