TEST REPORT

REPORT NUMBER: 150327002SHF-BP-4
ORIGINAL ISSUE DATE: August 28, 2015

EVALUATION CENTER

Intertek Testing Services Ltd., Shanghai
No.7 Building, No. 6958 Daye Road, Fengxian District., Shanghai

RENDERED TO

FUZHOU ROPO BUILDING MATERIALS CO., LTD.
TIELING INDUSTRIAL ZONE, MINHOU, FUZHOU, FUJIAN, CHINA

PRODUCT EVALUATED
UPVC Sliding Door (Three Panels Sliding Door)
Model: RP003

EVALUATION PROPERTY
Deflection / Span Ratio Test, Operating Force Test,
Air Infiltration Test, Water Penetration Test and Ultimate Strength Test

Report of Testing an UPVC Sliding Door (Three Panels Sliding Door) (Model: RP003) for compliance with the applicable requirements of the following criteria: AS 2047-2014 "*Windows and external glazed doors in buildings*", AS 4420.2-1996 *"Windows—Methods of test, Method 2: Deflection test"*, AS 4420.3-1996 "*Windows—Methods of test, Method 3: Operating force test*", AS 4420.4-1996 "*Windows—Methods of test, Method 4: Air infiltration test*", AS 4420.5-1996 "*Windows—Methods of test, Method 5: Water penetration resistance test*", AS 4420.6-1996 "*Windows—Methods of test, Method 6: Ultimate strength test*".

1 Table of Contents

2 Introduction

Intertek has conducted testing for Fuzhou ROPO Building Materials Co., Ltd., on an UPVC Sliding Door (Three Panels Sliding Door) (Model: RP003) to evaluate Deflection / Span Test, Operating Force Test, Air Infiltration Test, Water Penetration Test and Ultimate Strength Test. Testing was conducted in accordance with AS 2047-2014 specifications and method standards of:

- AS 4420.2-1996 *"Windows—Methods of test, Method 2: Deflection test"*
- AS 4420.3-1996 *"Windows—Methods of test, Method 3: Operating force test"*
- AS 4420.4-1996 *"Windows—Methods of test, Method 4: Air infiltration test"*
- AS 4420.5-1996 *"Windows—Methods of test, Method 5: Water penetration resistance test"*
- AS 4420.6-1996 *"Windows—Methods of test, Method 6: Ultimate strength test".*

This evaluation began on July 30, 2015 and was completed on August 03, 2015.

3 Test Samples

3.1. SAMPLE SELECTION

Samples were submitted to Intertek directly from the client. Samples were not independently selected for testing. Samples were received at the Evaluation Center on July 07, 2015.

3.2. SAMPLE AND ASSEMBLY DESCRIPTION

A full scale sample of UPVC Sliding Door (Three Panels Sliding Door) (Model: RP003) was provided by the manufacturer that was not weathered nor conditioned.

Table 1 Product Information

Product Name	UPVC Sliding Door (Three Panels Sliding Door)
Model	RP003
Dimension of Window Frame	3000 x 2200 mm
Dimension of Window Leaf	1025 x 2102 mm
UPVC Profile	Model: SL73 Manufacturer: VEKA Plastics (Shanghai) Co. Ltd.
Glazing	Dimesion: 883 x 1960 mm Structure: 5 mm Clear, Low E + 12 A + 5mm Clear, Toughened Supplier: Xinfuxing Glass Co., Ltd
Hardware	Model: EQ9 Supplier: Roto Frank AG
Drainage	Dimension: 5 x 30 mm Quantity: 7 PCS
Gasket (between leaf and frame)	Material: EPDM, Code-112.750/112.751 Supplier: Jiangyin Haida Rubber and Plastic Co., Ltd
Pile Strip (between leaf and frame)	Material: Silicone Pile Strips Supplier: Haining Lijialong Pile Weather Strip Co., Ltd.
Sealant of Glass	Material: Neutral Silicone Sealant Supplier: Hangzhou Zhijiang Silicone Co., Ltd

The sample ID number was S150327002SHF-004. The drawings of the representative sample were referenced in Appendix A.

4 Testing and Evaluation Methods

4.1. DEFLECTION / SPAN RATIO TEST

The Deflection Test was conducted in accordance with AS 4420.2-1996. The pressure was applied to test specimen in not less than four approximately equal increments until the test pressure was reached; first to the exterior surface (positive) and then to the interior surface (negative). The load duration was held for at least 1 minute at each pressure increment. The test specimen was evaluated for deflection during load, and was evaluated for permanent deflection after differential pressure removed for 2 minutes. According to Section 2.3.1.3 in AS 2047-2014, no structure members in a completely assembled and window should deflect by an amount greater than span/250 when the specimen was tested at the serviceability design wind pressure specified in Table 2.1 *WINDOW RATING FOR HOURSING* in AS 2047-2014.

4.2. OPERATING FORCE TEST

The Operating Force Test was conducted in accordance with AS 4420.3-1996. For the movable leaf of the door, the force was applied at the fixed handle position; and forces to initiate the leaf in motion and to maintain the motion should be recorded. The test force should be not greater than the value for windows given in Table 2.2 *OPERATING FORCE FOR TEST* in AS 2047-2014.

4.3. AIR INFILTRATION TEST

The Air Infiltration Test was conducted in accordance with AS 4420.4-1996. The test was performed using positive and negative differential pressures of 75 Pa. The air infiltration rates through the specimen should be determined. The air infiltration should not exceed the value specified in Table 2.3 *MAXIMUM AIR INFILTRATION* in AS 2047-2014.

4.4. WATER PENETRATION TEST

The Water Penetration Test was conducted in accordance with AS 4420.5-1996. The test specimen was subjected to water spraying uniformly and continuously over the exterior face of the test specimen at a rate not less than 0.5 $L/m^2 \cdot s$. At the start of test, the water sprays should operate for 5 minutes with zero air pressure. And then, the test pressures specified in Table 2.4 *Water Penetration Resistance Test Pressure* in AS 2047-2014 were applied and maintained for 15 minutes with the water sprays still operating. During the test sequence, there should be no uncontrolled water penetration observed.

4.5. ULTIMATE STRENGTH TEST

The Ultimate Strength Test was conducted in accordance with AS 4420.6-1996. The ultimate strength test pressure specified in Table 2.5 *ULTIMATE STRENGTH TEST PRESSURES* in AS 2047-2014 was increased smoothly and was applied to the test specimen for 10 seconds in both positive and negative direction. The test specimen should not collapse when subjected to the ultimate strength pressure, and was evaluated for permanent damage after loading.

5 Testing and Evaluation Results

5.1. RESULTS AND OBSERVATIONS

The test results are summarized in Table 2 below. A more comprehensive set of test data is included in Appendix B.

Table 2 Test Results

Test Description	Test Result	Verdict
Deflection / Span Ratio Test	Serviceability design wind pressure:1800 Pa Rating: N6 (General)	Pass
Operating Force Test	Force to Initial Movement: 42 N Force to Maintain Movement: 26 N	Pass
Air Infiltration Test	+75 Pa: 0.2 L/s·m^2; -75 Pa: 0.2 L/s·m^2; Average air leakage rate: 0.2 L/s·m^2 Rating: Low	Pass
Water Penetration Test	Test Pressure: 450 Pa Rating: N5 (Exposed)	Pass
Ultimate Strength Test	Test Pressure: 2000 Pa Rating: N4 (General)	Pass

6 Conclusion

The UPVC Sliding Door (Three Panels Sliding Door) (Model: RP003) identified in this report has been tested in accordance with Deflection / Span Ratio Test, Operating Force Test, Air Infiltration Test, Water Penetration Test and Ultimate Strength Test requirements as per AS 2047-2014.

The test specimen met the requirements for Rating of N6 for Deflection / Span Ratio Test, Operating force for horizontal sliding door, Air Infiltration Level of Low for Air Infiltration, Rating of N5 for Water Penetration Test and Rating of N4 for Ultimate Strength Test as per AS 2047-2014.

The conclusions of this test report may not be used as part of the requirements for Intertek product certification. Authority to Mark must be issued for a product to become certified.

INTERTEK

Reported by: Alvin. Zhu
Alvin Zhu
Engineer

Reviewed by: Fred Bao
Fred Bao
Senior Technical Supervisor

7 Appendix A: Sample Drawings

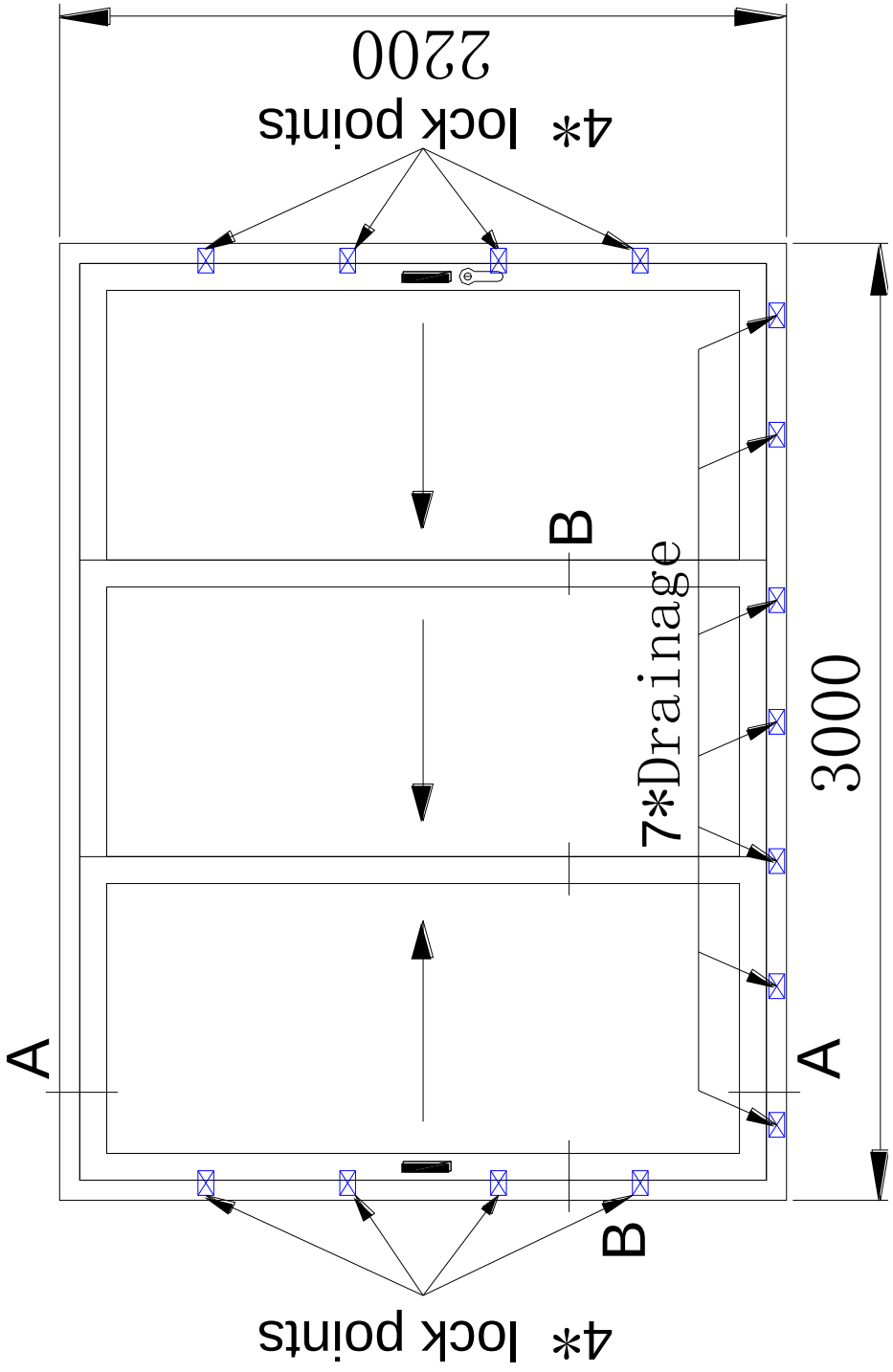


Fig.1 Drawing of Representative Sample

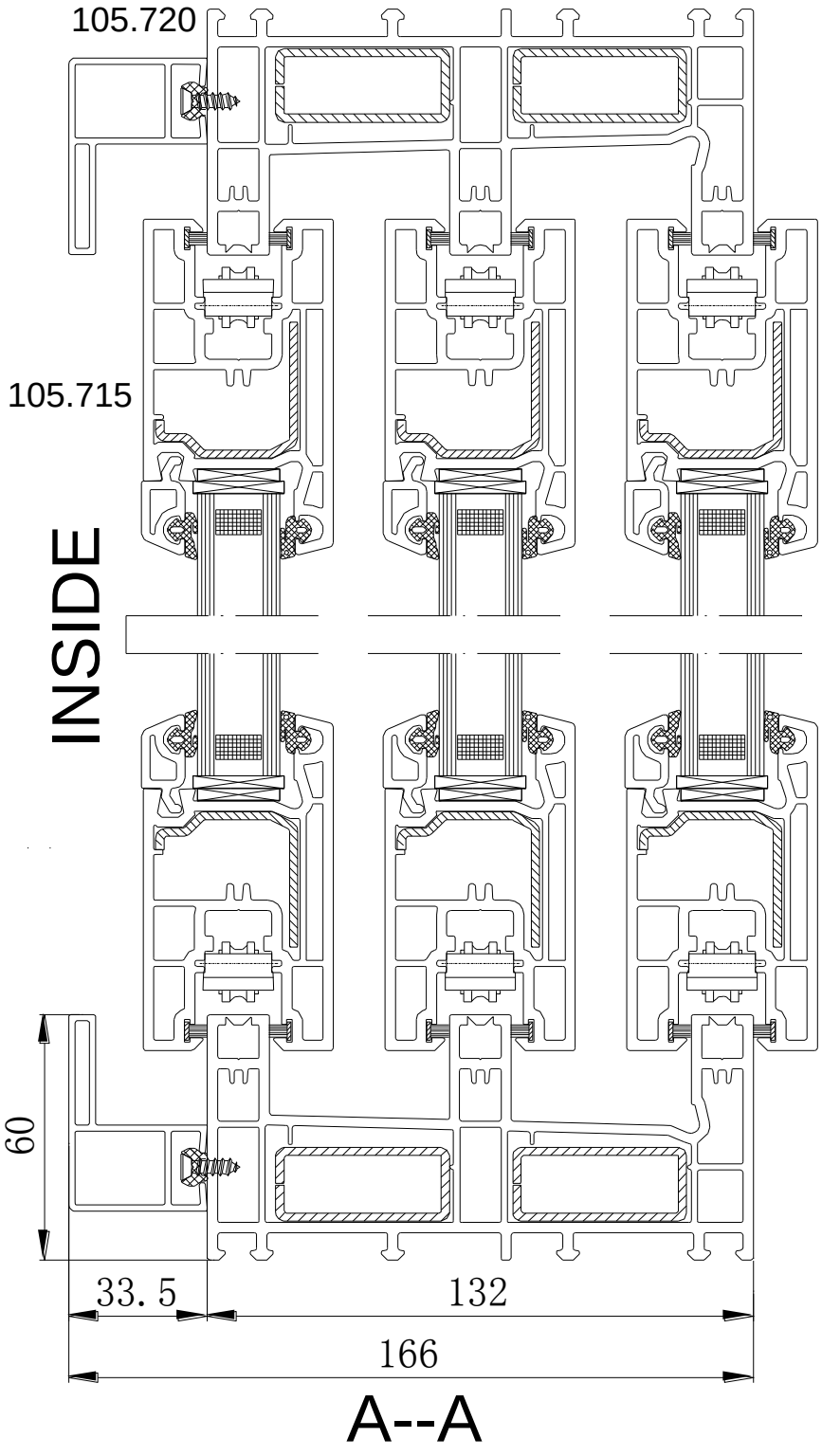


Fig.2 Sectional View of the Profiles

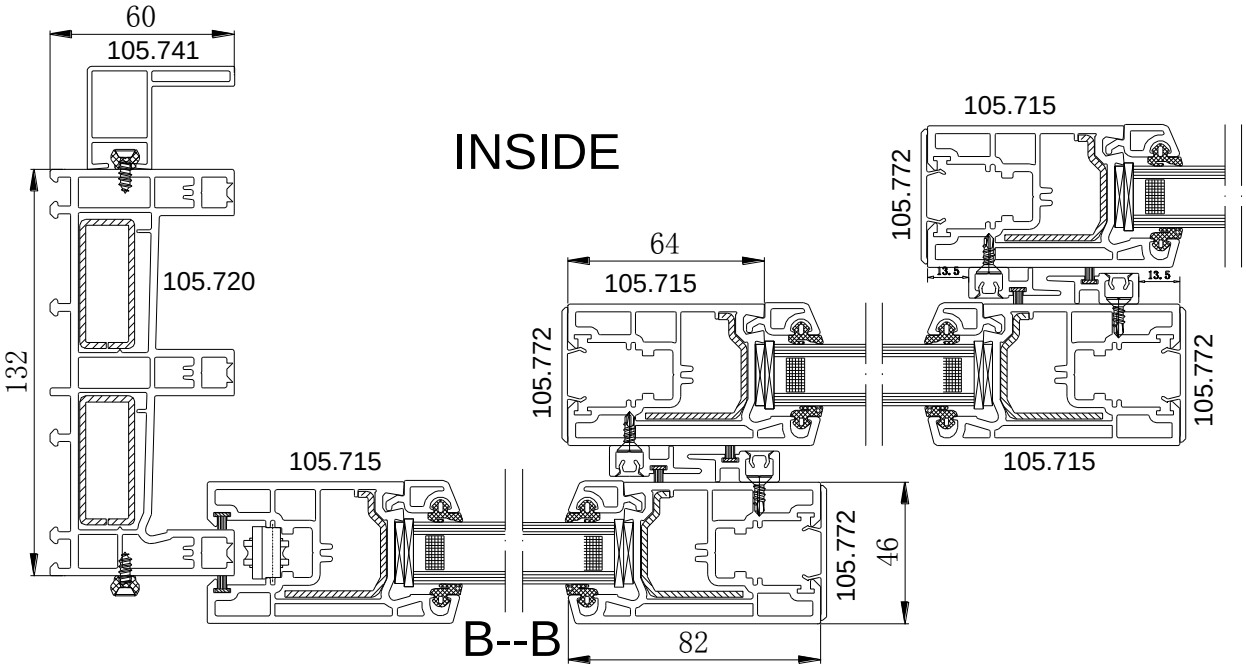


Fig.3 Sectional View of the Profiles

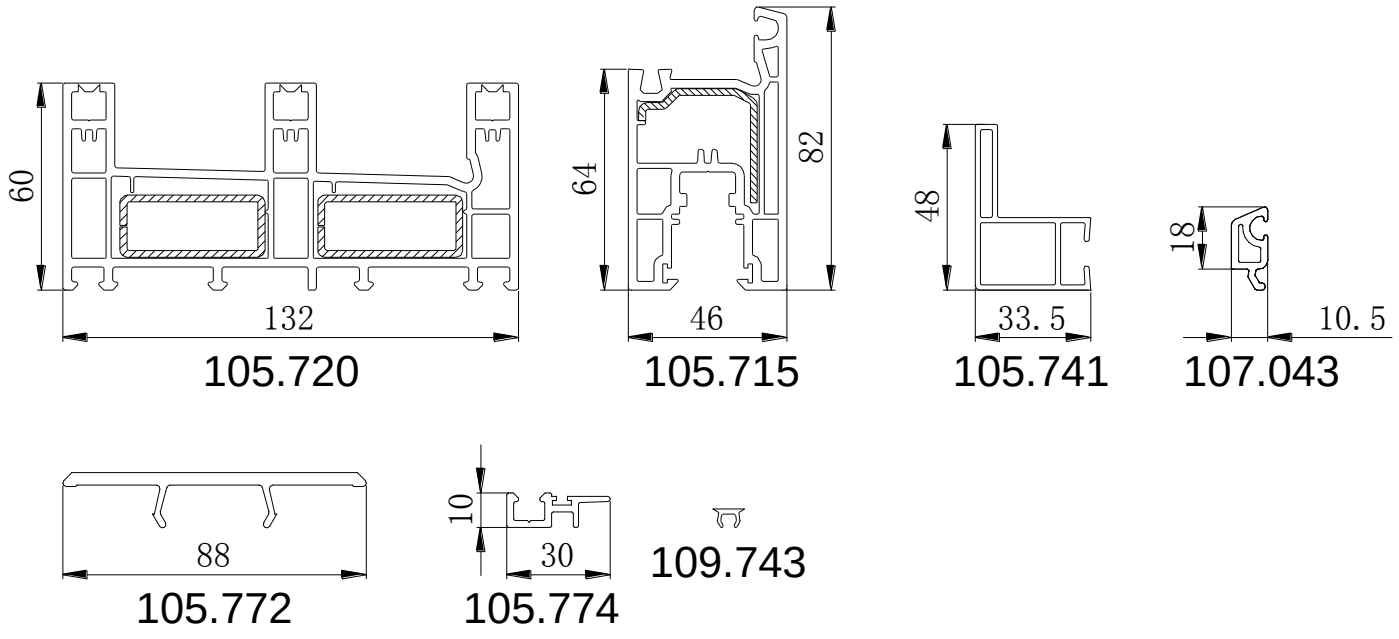
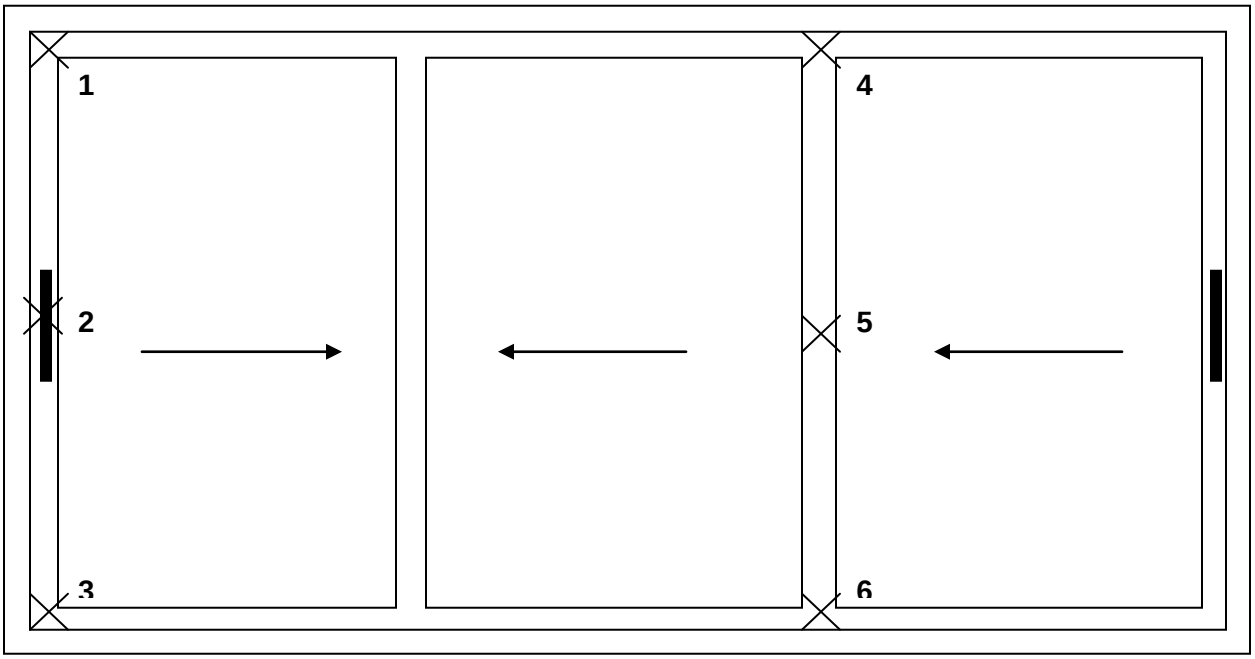


Fig.4 Sectional View of the Profiles

8 Appendix B: Test Data

1. <u>Deflection Test – Test method AS4420.2-1996</u>

- Span length, L = 2100 mm
- Maximum allowable deflection (Leaf) = Span / 250 = 8.4 mm
- Span length, L = 2100 mm
- Maximum allowable deflection (Mullion) = Span / 250 = 8.4 mm
- Test Pressure (Serviceability design wind pressure), P = 1800 Pa, Rating N6 (General).



Outside View

Fig.5 Locations of Displacement Measuring Devices

Table 3 Test Data of Deflection Test

Member (mm)		Test Pressure (Pa)	Deflection (mm)			Actual Deflection	Maximum allowable Deflection /Span Ratio	Verdict
Item	Span Length		1	2	3			
Leaf	2100	+P/4 = 450	0.7	0.9	0.1	3.0	8.4	Pass
		+2P/4 = 900	0.9	1.8	0.2			
		+3P/4 =1350	1.1	2.8	0.4			
		+P = 1800	1.3	3.9	0.5			
		0	0.1	0.2	0.0			
Leaf	2100	-P/4 = -450	0.8	2.0	0.1	5.0	8.4	Pass
		-2P/4 = -900	1.0	2.8	0.2			
		-3P/4 = -1350	1.2	3.7	0.3			
		-P = -1800	1.5	5.9	0.4			
		0	0.7	2.2	0.0			

Table 4 Test Data of Deflection Test

Member (mm)		Test Pressure (Pa)	Deflection (mm)			Actual Deflection	Maximum allowable Deflection /Span Ratio	Verdict
Item	Span Length		4	5	6			
Mullion	2100	+P/4 = 450	1.9	3.2	1.0	6.8	8.4	Pass
		+2P/4 = 900	3.1	6.0	1.7			
		+3P/4 =1350	4.1	8.4	2.4			
		+P = 1800	5.2	10.9	3.1			
		0	0.2	0.1	0.1			
Mullion	2100	-P/4 = -450	2.9	3.1	1.5	4.1	8.4	Pass
		-2P/4 = -900	4.7	6.1	2.6			
		-3P/4 = -1350	6.8	8.8	3.6			
		-P = -1800	9.9	11.4	4.8			
		0	2.5	0.7	0.8			

2. Operating force test – Test method AS4420.3-1996

Table 5 Test Data of Operating Force Test

Force Type	Force Data	Requirements	Verdict
To Initial Movement (N)	42	180	Pass
To Maintain Movement (N)	26	110	Pass

3. Air infiltration test – Test method AS4420.4-1996

- Overall area: 6.6 m^2

Table 6Test Data of Air Infiltration Test

Test pressure of 75 Pa	Infiltration rate (positive direction)	0.2 L/s·m^2
	Exfiltration rate (negative direction)	0.2 L/s·m^2
	Average air leakage rate	0.2 L/s·m^2
	Rating	Low
	Requirement: Maximum Air Infiltration	1.0 L/s·m^2

4. Water resistance test – Test method AS4420.5-1996

There was no water penetration after water sprayed for 15 minutes at 450 Pa. The pressure of 450 Pa for water penetration was requested by the applicant.
Water penetration: No water penetration.

Test result:
P_{max} = 450 Pa
Rating: N5 (Exposed)

5. Ultimate strength test – Test method AS4420.6-1996

Required ultimate strength test pressure: 2000 Pa
Rating: N4 (General)

Test result:
As requested by the applicant, the door was not collapsed when subjected to ultimate strength of 2000 Pa (N4).
No significant breakage, permanent deformation or operational malfunction after ultimate strength was released.

9 Revision Page

Revision No.	Date	Changes	Author	Reviewer
0	August 28, 2015	First issue	Alvin Zhu	Fred Bao

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