

GUANGZHOU APRO BUILDING MATERIAL CO., LTD

TEST REPORT

SCOPE OF WORK

WINDOWS AND DOORS

REPORT NUMBER

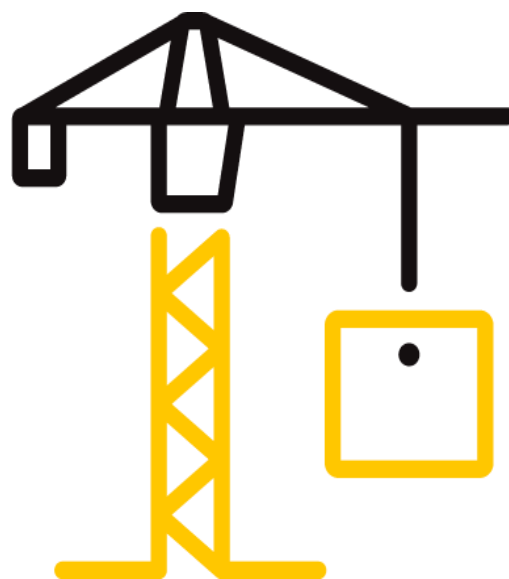
230616166GZC-004

ISSUE DATE

2023/7/3

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Intertek Testing Services Shenzhen Ltd. Guangzhou Branch

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Test Report

Issue Date: 2023/7/3

Intertek Report No. : 230616166GZC-004

Applicant:	GUANGZHOU APRO BUILDING MATERIAL CO., LTD
Applicant Address:	NO.9 OF 66 HUA GANG AVENUE HUADU DISTRICT, GUANGZHOU, GUANGDONG, CHINA, 510815.
Attn:	JASON@GZAPRO.COM

Manufacturer:	GUANGZHOU APRO BUILDING MATERIAL CO., LTD
Manufacturer Address:	NO.9 OF 66 HUA GANG AVENUE HUADU DISTRICT, GUANGZHOU, GUANGDONG, CHINA, 510815.
Attn:	JASON@GZAPRO.COM

Primary designator:	Class CW-PG40: Size Tested 1200mm × 1800mm (47.24in. × 70.87in.) - Type DAW Class CW-PG40: Size Tested 1500mm × 1800mm (59.06in. × 70.87in.) - Type FW
Secondary designator:	Positive Design Pressure = +1920 Pa (+40.10 psf) Negative Design Pressure = -1920 Pa (-40.10 psf) Water penetration resistance test pressure = 290 Pa (6.06 psf) Canadian Air Infiltration/Exfiltration = A3 Level for Tilt and Turn Window Canadian Air Infiltration/Exfiltration = Fixed Level for Fixed Window

SUBJECT: Performance testing
<Tilt and Turn Window with Fixed Window Assembly>

Dear Sir,

This test report for represents the results of our evaluation of the above referenced product(s) to the requirements contained in the following standards:

TEST METHODS AND STANDARDS
AAMA/WDMA/CSA 101/I.S.2/A440-17 (NAFS 2017 - North American Fenestration Standard / Specification for Windows, Doors and Skylights) CSA A440S1-19 (Canadian Supplement to AAMA/WDMA/CSA 101/I.S.2/A440-17)

SAMPLE ID	MODEL	SPECIFICATION
S230616166GZU.003	A80T series	2700 mm (Width) × 1800 mm (Height) × 80 mm (Thickness)

SAMPLE RECEIVED: 2023/6/15
TESTED FROM: 2023/6/21 TO 2023/6/23

TEST LOCATION: C2-1 Building Heping Fair, Yongning Street, Zengcheng District, Guangzhou, China

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Test Items, Method and Results:

1 Test Samples

Sample was submitted to Intertek directly from the client. Sample was not independently selected for testing. Sample was received at the Evaluation Center on June 15, 2023.

A full scale sample of Dual-action Window with Fixed Window assembly (Model: A80T series) was provided by the manufacturer that was not weathered nor conditioned.

The description of the samples given below has been prepared from information provided by the sponsor of the test. All values quoted are nominal, unless tolerances are given.

Table 1 Product Information

Product Name	A80T series Tilt & Turn window
Model	A80T series
Dimension of Window Frame	2700 mm (Width) × 1800 mm (Height) × 80 mm (Thickness)
Dimension of Window Sash	Operable Sash: 1143 mm (Width) × 1744 mm (Height) × 88 mm (Thickness)
Aluminum Profile	Model: MD-S8001/MD-S8004/MD-W15206/HQ-4127/SC01/SC02 Supplier: Foshan Fei Bo Metal Co., Ltd
Frame Corner Construction Details	Mitre-cut, assembly with corners keys
Reinforcement	Not applicable
Glazing	Dimension: Operable Sash: 1027 mm (Width) × 1628 mm (Height); Fixed Panel: 1417 mm (Width) × 1718 mm (Height); Structure: 42mm(6mm Low-e+12(Argon)+6mmLow-e+12(Argon)+ 6mm Clear, Tempered Triple Insulating Glass (IGDB: #2986) Supplier: JIANGMEN JUNFA SAFETY GLASS CO., LTD
Weather-strip	Not applicable
Thermal Break	Model: TB30/TB30B Supplier: Foshan LAMPSTONE Plastic Co.,Ltd
Drainage	Sizes: 35 mm (Width) × 5 mm (Height) Quantity: 6
Gasket	Model: MDF12003/EP156B/MDF12008/MDF12037 Material: EPDM Supplier: Foshan Gui Mi Rubber & Plastic Co.,Ltd

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Table 1 Product Information(Cont.)

Hardware	<p>Specified type: Spindle Handle; Model: C-90608-33-0-6 Specified type: Handle Screw; Model: C-70001-35-0-8 Specified type: Gear w/o mishandling; Model: C-39385-00-0-1 Specified type: Stay Guide; Model: 6-37473-00-R-1 Specified type: Central locking set; Model: K-19054-00-0-1 Specified type: Tilt & Turn Striker; Model: 6-37272-01-0-1 Specified type: Locking Cam; Model: 6-37111-00-0-8 Specified type: Locking Plate; Model: C-90270-00-0-1 Specified type: Stay Arm; Model: 6-37471-00-R-1 Specified type: Corner bearing; Model: 6-37059-R-1 Specified type: Corner Hinge; Model: K-19471-00-r-R-1 Specified type: Corner Drive Link; Model: 6-37266-00-0-1 Specified type: Middle lock corner drive; Model: 6-37266-00-0-1 Supplier: GU</p>
Sealant of Glass	Not applicable
Installation	The rough opening allowed for a 1/4" shim space. The exterior perimeter of the test specimen was sealed with silicone sealant.

The sample ID number was S230616166GZU.003. The drawings of the representative sample were referenced in Appendix A, the test data was referenced in Appendix B and the photo of the representative sample was referenced in Appendix C.

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Test Items, Method and Results:

2 Test Result

Table 2 Test Result

Test Description	Requirements (Class CW-PG40)		Results		Verdict
Air leakage resistance test (Tilt and Turn window part)	Maximum air leakage at +75 Pa	0.5 L/s·m ²	Air leakage at +75 Pa	0.02 L/s·m ²	Pass
	Maximum air leakage at -75 Pa	0.2 L/s·m ²	Air leakage at -75 Pa	0.02 L/s·m ²	
Air leakage resistance test (Fixed Part)	Maximum air leakage at +75 Pa	0.5 L/s·m ²	Air leakage at +75 Pa	<0.01 L/s·m ²	Pass
	Maximum air leakage at -75 Pa	0.2 L/s·m ²	Air leakage at -75 Pa	<0.01 L/s·m ²	
Water penetration resistance test	Minimum water pressure	290 Pa	Test Pressure	290 Pa	Pass
			No water penetration occurred at 290Pa by the method of cyclic static air pressure difference during and after test.		
Uniform load deflection test at design pressure	Design Pressure (DP)	1920 Pa	Test Pressure	1920 Pa	Pass
			Maximum deflection at operable sash handle side stile	2.5 mm	
			Maximum deflection at operable sash bottom rail	0.4 mm	
			Maximum deflection at Mullion	2.9 mm	

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Table 2 Test Result(Cont.)

Test Description	Requirements (Class CW-PG40)		Results		Verdict
Uniform load structural test	Structural Test Pressure (STP)	2880 Pa	Test Pressure	2880 Pa	Pass
			After the test loads were released, there was no failure or permanent deformation of any part of the window system that would cause the test specimen to be inoperable. There was no permanent deformation which was in excess of 0.3% of its span.		
			Maximum deflection at operable sash handle side stile	0.9 mm	
			Maximum deflection at operable sash bottom rail	<0.1 mm	
			Maximum deflection at Mullion	0.9 mm	
Sash/leaf concentrated load test on latch rail	Perpendicular (normal to the plane)	Deflection limit: 1.5 mm	Deflection at 135N	0.32 mm	Pass
	Parallel (in the plane)	Deflection limit: 3.3 mm	Deflection at 230N	0.43 mm	
Stabilizing arm load test	The load to the sash:		After load removal, there was no damage to the frame, operable sash components, glass, stabilizing arm, or hardware components, and the product was function normally.		Pass
	Sash corners	890 N			
	Top rail at center	1780 N			
Forced-entry resistance test	Minimum Grade 10		Test Class	Grade 10	Pass
			After test, there was no opening which allows for entrance through the tested specimen. The sash remained locked and closed. Lock and hinges were not disengaged.		
Insect screen serviceability test	A force of 60N is applied perpendicular to the plane of the screen in the outward direction. The screen shall remain in place in the frame. And there shall be no disengagement or deformation.		No disengagement was found.		Pass

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Appendix A: Sample Drawings

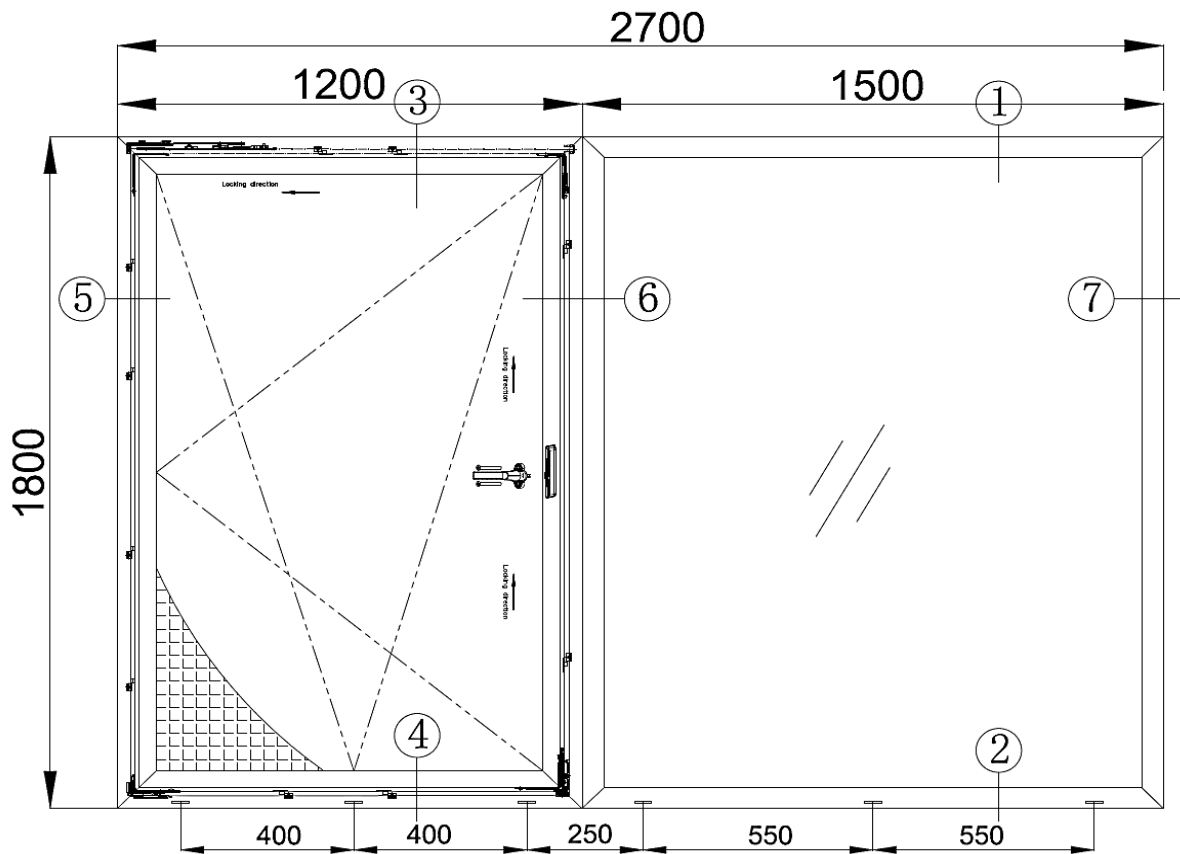


Fig.1 Drawing of Representative Sample

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Appendix B: Test Data

B.1 Air Leakage Resistance Test – Test method: ASTM E283/E283M-2019

Tilt and Turn Window area: 2.16 m² (23.25 ft²)

Table B.1 Test Data of Air Leakage Resistance Test

	Air Leakage in cfm/ft ²	Air Leakage in L/s·m ²
Infiltration rate (75 Pa)	0.004	0.02
Exfiltration rate (75 Pa)	0.004	0.02
Average air leakage rate (75 Pa)	0.004	0.02

The Tilt and Turn window part of tested specimen met the requirements of Class CW-PG40 for Air Leakage Resistance Test as per AAMA/WDMA/CSA 101/I.S.2/A440-17 and CSA A440S1-19.

Fixed area: 2.70 m² (29.06 ft²)

Table B.2 Test Data of Air Leakage Resistance Test

	Air Leakage in cfm/ft ²	Air Leakage in L/s·m ²
Infiltration rate (75 Pa)	<0.001	<0.01
Exfiltration rate (75 Pa)	<0.001	<0.01
Average air leakage rate (75 Pa)	<0.001	<0.01

The Fixed part of tested specimen met the requirements of Class CW-PG40 for Air Leakage Resistance Test as per AAMA/WDMA/CSA 101/I.S.2/A440-17 and CSA A440S1-19.

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Appendix B: Test Data

B.2 Water resistance test – Test method ASTM E547-2000(R2016)

No water penetration occurred at 290Pa by the method of cyclic static air pressure difference during and after test according to ASTM E547-2000(R2016).

The tested specimen met the requirements of Class CW-PG40 for Water Penetration Resistance Test as per AAMA/WDMA/CSA 101/I.S.2/A440-17 and CSA A440S1-19.

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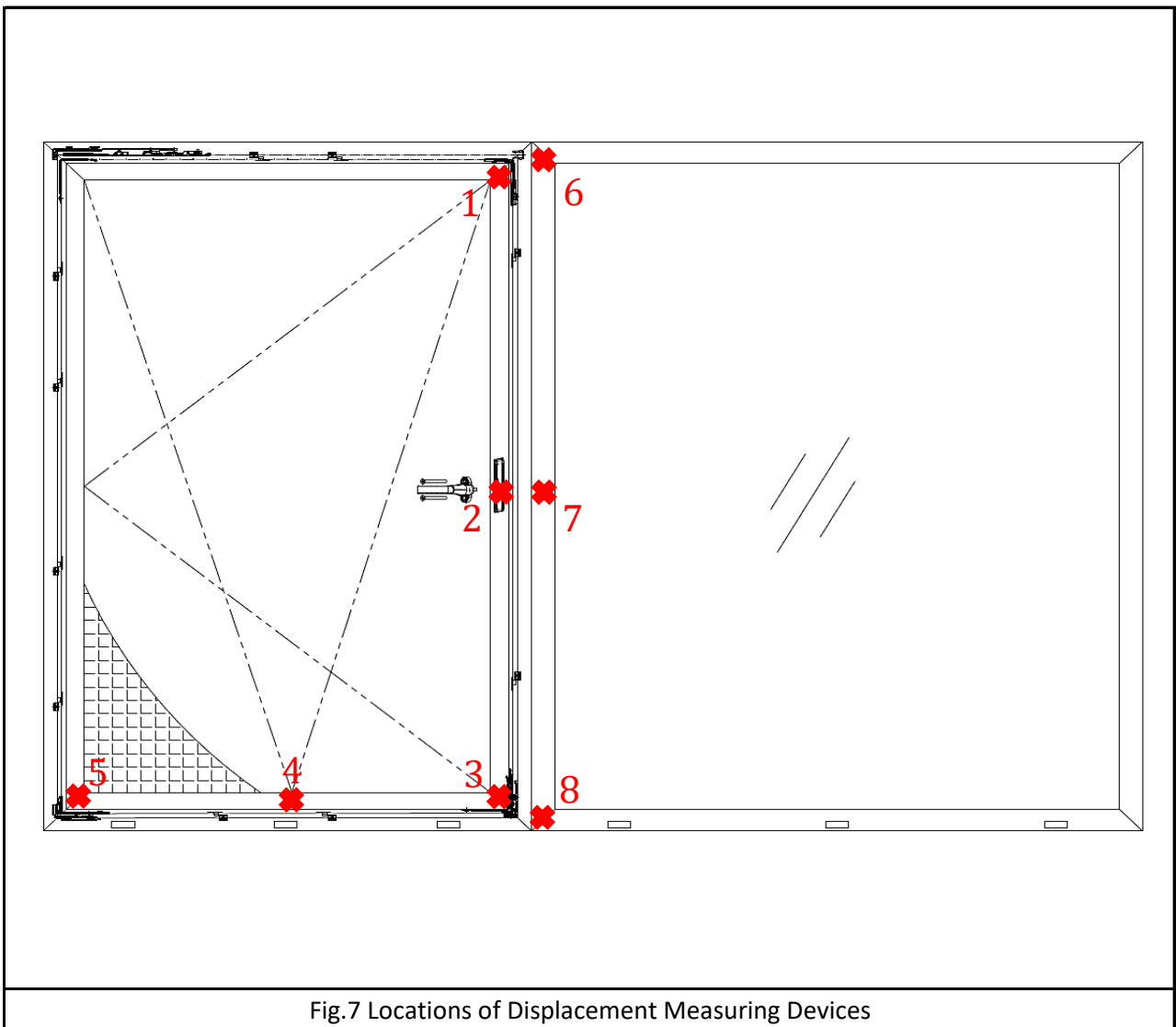
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Appendix B: Test Data

B.3 Uniform Load Deflection Test – Test method ASTM E330/E330M-2014, Procedure A

Span length, L1 = 1640 mm (Point: #1-3 for Operable sash handle side stile)
Span length, L2 = 1030 mm (Point: #3-5 for Operable sash bottom rail)
Span length, L3 = 1720 mm (Point: #6-8 for Mullion)

Test Pressure (DP), P = 1920 Pa



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B.3 Uniform Load Deflection Test – Test method ASTM E330/E330M-2014, Procedure A (Cont.)

Table B.3 Test Data of Uniform Load Deflection Test

Member (mm)		Test Pressure (Pa)	Displacement (mm)			Deflection
Item	Span Length		1	2	3	
Operable sash handle side stile	1640	+P = +1920	1.4	3.7	0.9	2.6
		0	0.3	0.3	0.3	<0.1
		-P = -1920	2.1	4.1	1.4	2.4
		0	0.1	0.1	0.1	<0.1
Member (mm)		Test Pressure (Pa)	Displacement (mm)			Deflection
Item	Span Length		3	4	5	
Operable sash bottom rail	1030	+P = +1920	0.9	0.9	0.2	0.4
		0	0.3	0.2	0.2	0.1
		-P = -1920	1.4	1.2	0.2	0.4
		0	0.1	0.1	0.1	<0.1
Member (mm)		Test Pressure (Pa)	Displacement (mm)			Deflection
Item	Span Length		6	7	8	
Mullion	1720	+P = +1920	0.8	3.4	0.4	2.8
		0	0.2	0.3	0.2	0.1
		-P = -1920	1.2	3.7	0.5	2.9
		0	0.1	0.1	0.1	<0.1

Table B.4 Test Data of Uniform Load Deflection Test for Operable Sash Handle Side Stile

Test Pressure	Positive		Negative	
	Deflection	Perm. Set	Deflection	Perm. Set
Measurements, mm	2.6	<0.1	2.4	<0.1
Deflection limit at design pressure, L1/175=9.37 mm				

Table B.5 Test Data of Uniform Load Deflection Test for Operable Sash Bottom Rail

Test Pressure	Positive		Negative	
	Deflection	Perm. Set	Deflection	Perm. Set
Measurements, mm	0.4	0.1	0.4	<0.1
Deflection limit at design pressure, L1/175=5.89 mm				

Table B.6 Test Data of Uniform Load Deflection Test for Mullion

Test Pressure	Positive		Negative	
	Deflection	Perm. Set	Deflection	Perm. Set
Measurements, mm	0.0	2.8	0.1	2.9
Deflection limit at design pressure, L1/175=9.83 mm				

During each load, no main frame or sash member deflected more than L/175, where L is the length of the unsupported span. And no damage was found, the operation was normal after testing.

The tested specimen met the requirements for Class CW-PG40 for Uniform Load Deflection Test as per AAMA/WDMA/CSA 101/I.S.2/A440-17 and CSA A440S1-19.

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Appendix B: Test Data

B.4 Uniform Load Structural Test – Test method ASTM E330/E330M-2014, Procedure A

Design Pressure, P = 1920 Pa ; Structural Pressure, P = 2880 Pa

Table B.7 Test Data of Uniform Load Structural Test

Member (mm)		Test Pressure (Pa)	Permanent deformation(mm)			Net permanent deformation,mm
Item	Span Length		1	2	3	
Operable sash handle side stile	1640	+P = +2880	—	—	—	—
		0	0.5	1.1	0.4	0.7
		-P = -2880	—	—	—	—
		0	0.5	1.3	0.4	0.9
Member (mm)		Test Pressure (Pa)	Permanent deformation(mm)			Net permanent deformation,mm
Item	Span Length		3	4	5	
Operable sash bottom rail	1030	+P = +2880	—	—	—	—
		0	0.4	0.3	0.2	<0.1
		-P = -2880	—	—	—	—
		0	0.4	0.3	0.2	<0.1
Member (mm)		Test Pressure (Pa)	Permanent deformation(mm)			Net permanent deformation,mm
Item	Span Length		6	7	8	
Mullion	1720	+P = +2880	—	—	—	—
		0	0.3	1.1	0.3	0.8
		-P = -2880	—	—	—	—
		0	0.4	1.2	0.3	0.9

Table B.8 Test Data of Uniform Load Structural Test for Operable Sash Handle Side Stile

Test Pressure	Perm. Set	
	Positive	Negative
Measurements, mm	0.7	0.9
Permanent deflection limit, L1*0.3%=4.92 mm		

Table B.9 Test Data of Uniform Load Structural Test for Operable Sash Bottom Rail

Test Pressure	Perm. Set	
	Positive	Negative
Measurements, mm	<0.1	<0.1
Permanent deflection limit, L2*0.3%=3.09 mm		

Table B.10 Test Data of Uniform Load Structural Test for Mullion

Test Pressure	Perm. Set	
	Positive	Negative
Measurements, mm	0.8	0.9
Permanent deflection limit, L2*0.3%=5.16 mm		

After the test loads were released, there was no failure or permanent deformation of any part of the window system that would cause the test specimen to be inoperable. There was no permanent deformation which was in excess of 0.3% of its span.

The tested specimen met the requirements of Class CW-PG40 for Uniform Load Structural Test as per AAMA/WDMA/CSA 101/1.S.2/A440-17 and CSA A440S1-19.

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Appendix C: Sample Received Photo



REPORT AUTHORIZED

When signed with physical or electronic signature, the contents of this report have been prepared and approved per Intertek's quality process in accordance with ISO 17025.

Approved by:

Prepared by:

Ziqing Chen

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Name: Ziqing Chen

Title: Reviewer

Name: Oliver Zhu

Title: Project Engineer

Revision:

Revision No.	Date	Revision Reason	Revision Summary	Author	Reviewer
R0	/	/	Original Report Issue	/	/

End of Test Report