# GUANGZHOU APRO BUILDING MATERIAL CO., LTD

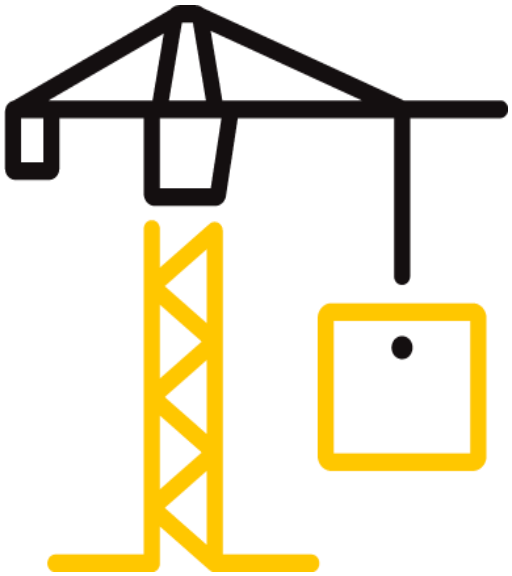
# TEST REPORT

**SCOPE OF WORK**
WINDOWS AND DOORS

**REPORT NUMBER**
230616166GZC-002

**ISSUE DATE**
2023/8/21

**PAGES**
21



**Intertek Testing Services Shenzhen Ltd. Guangzhou Branch**

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# Test Report

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| | |
|---|---|
| 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 2600mm × 2100mm (102.36in. × 82.68in.) - Type FLD |
| Secondary designator: | Positive Design Pressure = +1920 Pa (+40.10 psf)<br>Negative Design Pressure = -1920 Pa (-40.10 psf)<br>Water penetration resistance test pressure = 290 Pa (6.06 psf)<br>Canadian Air Infiltration/Exfiltration = A3 level |

**SUBJECT:** Performance testing
< Folding Door >

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)<br>CSA A440S1-19 (Canadian Supplement to AAMA/WDMA/CSA 101/I.S.2/A440-17) |

| SAMPLE ID | MODEL | SPECIFICATION |
|---|---|---|
| S230616166GZU.001 | A68T series | 2600 mm (Width) × 2100 mm (Height) × 77.3 mm (Thickness) |

SAMPLE RECEIVED: 2023/8/2
TESTED FROM: 2023/8/10 TO 2023/8/10

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 August 2, 2023.
A full scale sample of Folding Door (Model: A68T 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 | A68T series Folding Door |
| Model | A68T series |
| Dimension of Door Frame | 2600 mm (Width) × 2100 mm (Height) × 77.3 mm (Thickness) |
| Dimension of Door Leaf | Size: 582.8 mm (Width) × 2004 mm (Height) × 64.4 mm (Thickness)<br>Quantity: 4 |
| Aluminum Profile | Model: KSBG 6801, KSBG 6802, KSBG 6809, KSBG 6810, KSBG 6843, KSBG 6844, KSBG 6803, KSBG 6804, KSBG 6819, KSBG 6820, KSBG 6807, KSBG 6808, KSBG 6805, KSBG 6806<br>Supplier: Foshan HengJian Aluminium Co., Ltd |
| Frame Corner Construction Details | Mitre-cut, assembly with corners keys |
| Reinforcement | Not applicable |
| Glazing | Dimension: 493 mm (Width) × 1914 mm (Height);<br>Quantity: 4<br>Structure: 36mm (6mm Low-e+9(argon)+6mmLow-e+9(argon)+6mm Clear) tempered Triple Tempered glass<br>Supplier: JIANGMEN JUNFA SAFETY GLASS CO., LTD |
| Weather-strip | Not applicable |
| Thermal Break | Model: TB14.8<br>Supplier: Foshan LAMPSTONE Plastic Co.,Ltd |
| Drainage | Sizes: 35 mm (Width) × 5 mm (Height)<br>Quantity: 5 |
| Gasket | Model:<br>EP775H/EP190D/EP1926G/ABE3587/EP0700D-MF/EP005D-MF /ABE597/ABE598<br>Material: EPDM<br>Supplier: QINGDAO AOBO RUBBER PRODUCTS CO., LTD |

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**Table 1 Product Information(Cont.)**

| | |
|---|---|
| Hardware | Specified type: Door Hinge A; Model: KS-HY0068AX-63<br>Specified type: Top Wheel; Model: KS-HL0042SX-63<br>Specified type: Bottom Wheel; Model: KS-HL0044XX-63<br>Specified type: Door Handle; Model: KS-XN0003AL-03<br>Specified type: Door Latch B; Model: KS-CX0081DL-02<br>Specified type: 5. 14.5mm Transmission Box B; Model: KS-CD0145BX-62<br>Specified type: 1.5mm S.S Wire; Model: NA<br>Supplier: KSBG |
| Sealant of Glass | Model: SS550<br>Material: Silicone sealant<br>Supplier: Guangzhou Baiyun Chemical Industry Co., Ltd |
| 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.001. 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 | Maximum air leakage at +75 Pa | 0.5 L/s·m$^2$ | Air leakage at +75 Pa | 0.03 L/s·m$^2$ | Pass |
| | Maximum air leakage at -75 Pa | 0.5 L/s·m$^2$ | Air leakage at -75 Pa | 0.04 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 first sash stile | 0.9 mm | |
| | | | Maximum deflection at second sash stile | 3.4 mm | |
| | | | Maximum deflection at meeting stile of second sash | 3.1 mm | |
| | | | Maximum deflection at meeting stile of third sash | 3.2 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 door 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 first sash stile | 0.1 mm | |
| | | | Maximum deflection at second sash stile | <0.1 mm | |
| | | | Maximum deflection at meeting stile of third sash | 0.1 mm | |
| | | | Maximum deflection at meeting stile of fourth sash | 0.1 mm | |
| Deglazing test | Load for vertical sash member: 320 N | | Movement of vertical sash member: 10.5%<br><br>Operation of test specimen was normal after testing. And there was no glazing breakage. | | Pass |
| | Panel members shall not move from their original position by more than 90% of the original glazing bite. The test specimen shall not be damaged in any way that would inhibit normal operation of the window or door. And there shall be no glazing breakage. | | | | |

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**Appendix A: Sample Drawings**

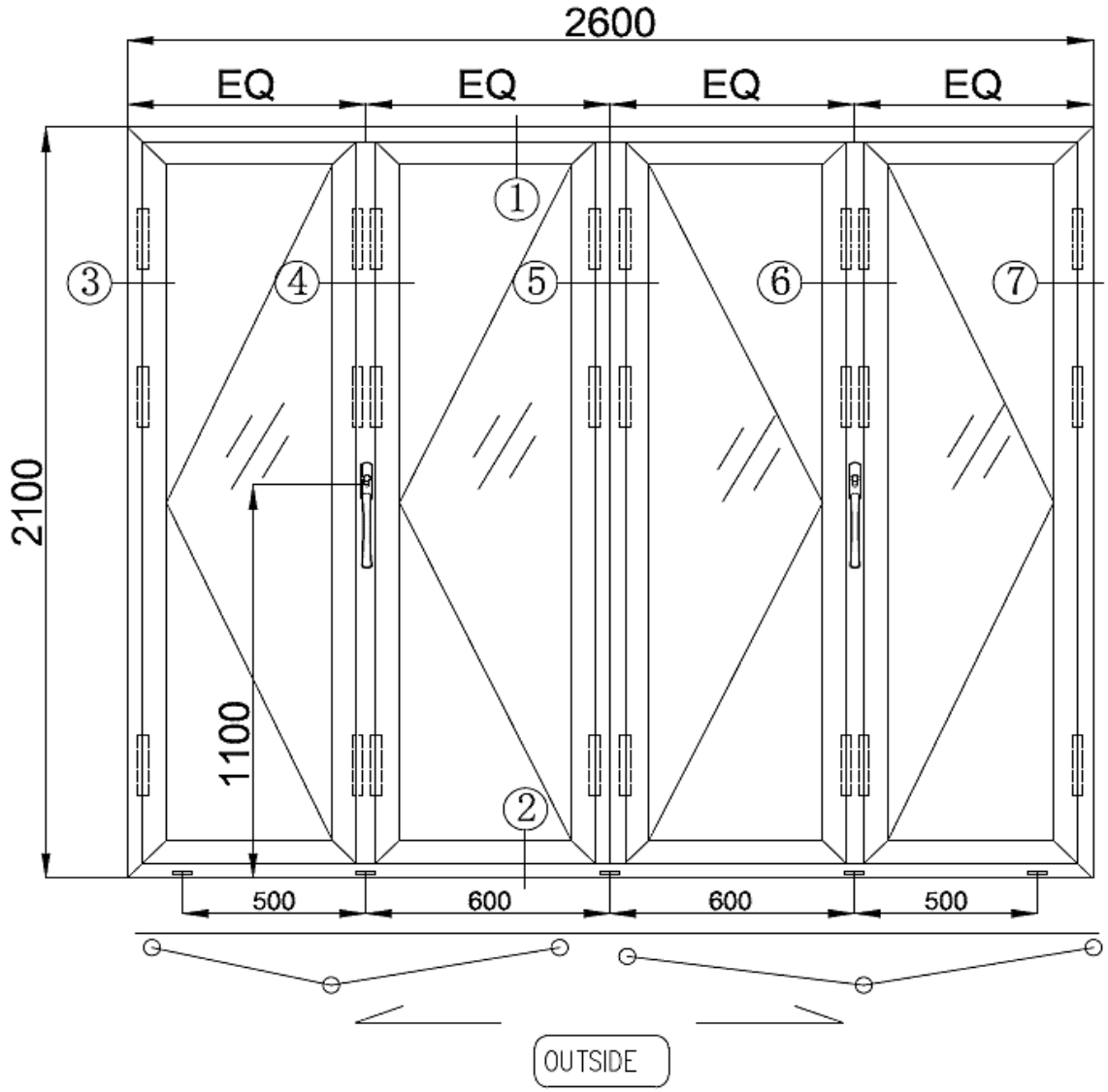


Fig.1 Drawing of Representative Sample

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**Appendix B: Test Data**

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

Door area: 5.46 $m^2$ ( 58.77 $ft^2$ )

**Table B.1 Test Data of Air Leakage Resistance Test**

| | Air Leakage in $cfm/ft^2$ | Air Leakage in $L/s \cdot m^2$ |
|---|---|---|
| Infiltration rate (75 Pa) | 0.006 | 0.03 |
| Exfiltration rate (75 Pa) | 0.008 | 0.04 |
| Average air leakage rate (75 Pa) | 0.007 | 0.04 |

The 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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**Appendix B: Test Data**

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

| | | | | |
|---|---|---|---|---|
| Span length, L1 = | 1960 mm | (Point: #1-3 for | First sash stile | ) |
| Span length, L2 = | 1960 mm | (Point: #4-6 for | Second sash stile | ) |
| Span length, L3 = | 1960 mm | (Point: #7-9 for | Meeting stile of second sash | ) |
| Span length, L4 = | 1960 mm | (Point: #10-12 for | Meeting stile of third sash | ) |

Test Pressure (DP), P = 1920 Pa

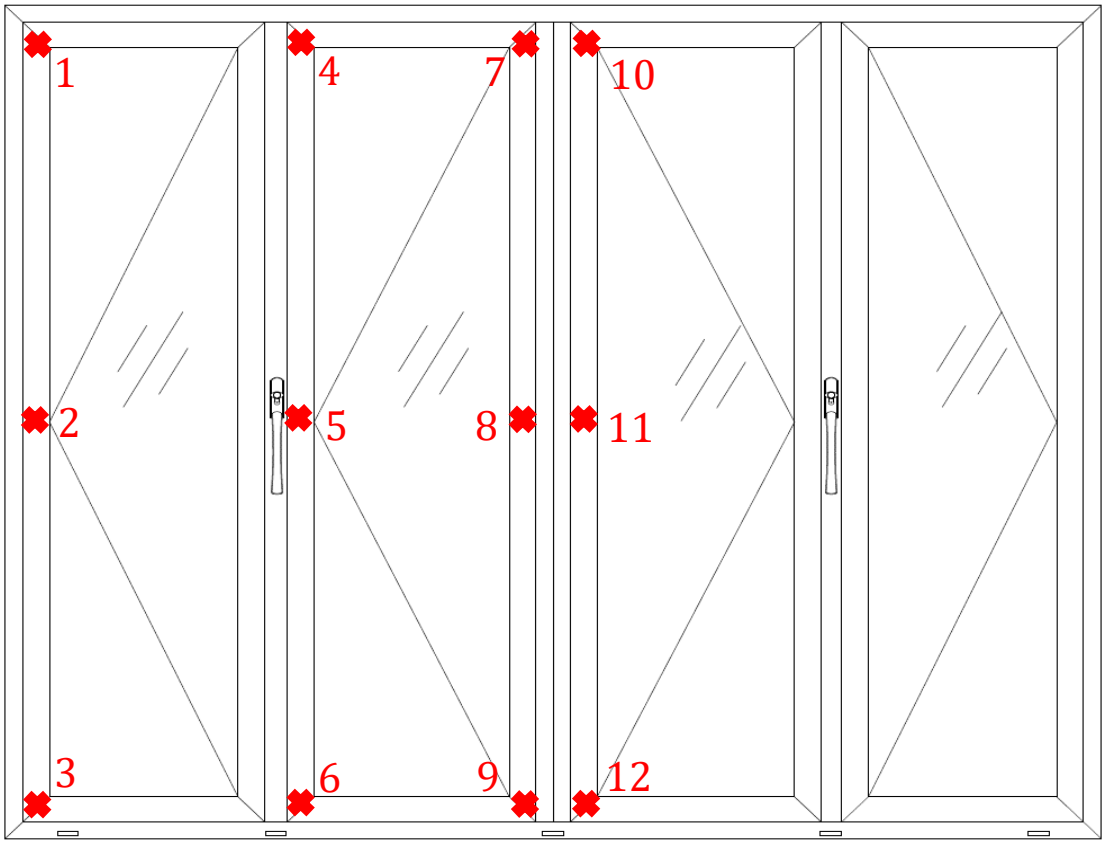


Fig.8 Locations of Displacement Measuring Devices

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

**Table B.2 Test Data of Uniform Load Deflection Test**

| Member (mm) | | Test Pressure (Pa) | Displacement (mm) | | | Deflection |
|---|---|---|---|---|---|---|
| Item | Span Length | | 1 | 2 | 3 | |
| First sash stile | 1960 | +P = +1920 | 0.5 | 1.1 | 0.2 | 0.8 |
| | | 0 | 0.1 | 0.1 | 0.1 | <0.1 |
| | | -P = -1920 | 0.7 | 1.4 | 0.4 | 0.9 |
| | | 0 | 0.1 | 0.2 | 0.2 | 0.1 |
| Member (mm) | | Test Pressure (Pa) | Displacement (mm) | | | Deflection |
| Item | Span Length | | 4 | 5 | 6 | |
| Second sash stile | 1960 | +P = +1920 | 3.1 | 5.9 | 2.0 | 3.4 |
| | | 0 | 0.2 | 0.4 | 0.4 | 0.1 |
| | | -P = -1920 | 4.3 | 7.3 | 4.1 | 3.1 |
| | | 0 | 0.6 | 0.7 | 0.7 | 0.1 |
| Member (mm) | | Test Pressure (Pa) | Displacement (mm) | | | Deflection |
| Item | Span Length | | 7 | 8 | 9 | |
| Meeting stile of second sash | 1960 | +P = +1920 | 2.2 | 5.0 | 1.7 | 3.1 |
| | | 0 | 0.2 | 0.2 | 0.2 | <0.1 |
| | | -P = -1920 | 2.7 | 5.5 | 2.9 | 2.7 |
| | | 0 | 0.4 | 0.4 | 0.4 | <0.1 |
| Member (mm) | | Test Pressure (Pa) | Displacement (mm) | | | Deflection |
| Item | Span Length | | 10 | 11 | 12 | |
| Meeting stile of third sash | 1960 | +P = +1920 | 2.2 | 5.2 | 1.8 | 3.2 |
| | | 0 | 0.2 | 0.2 | 0.1 | 0.1 |
| | | -P = -1920 | 2.8 | 5.8 | 3.0 | 2.9 |
| | | 0 | 0.3 | 0.3 | 0.4 | 0.1 |

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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 for First Sash Stile**

| Test Pressure | Positive | | Negative | |
|---|---|---|---|---|
| | Deflection | Perm. Set | Deflection | Perm. Set |
| Measurements, mm | 0.8 | <0.1 | 0.9 | 0.1 |
| Deflection limit at design pressure, L1/175=11.2 mm | | | | |

**Table B.4 Test Data of Uniform Load Deflection Test for Second Sash Stile**

| Test Pressure | Positive | | Negative | |
|---|---|---|---|---|
| | Deflection | Perm. Set | Deflection | Perm. Set |
| Measurements, mm | 3.4 | 0.1 | 3.1 | 0.1 |
| Deflection limit at design pressure, L2/175=11.2 mm | | | | |

**Table B.5 Test Data of Uniform Load Deflection Test for Meeting Stile of Second Sash**

| Test Pressure | Positive | | Negative | |
|---|---|---|---|---|
| | Deflection | Perm. Set | Deflection | Perm. Set |
| Measurements, mm | 3.1 | <0.1 | 2.7 | <0.1 |
| Deflection limit at design pressure, L3/175=11.2 mm | | | | |

**Table B.6 Test Data of Uniform Load Deflection Test for Meeting Stile of Third Sash**

| Test Pressure | Positive | | Negative | |
|---|---|---|---|---|
| | Deflection | Perm. Set | Deflection | Perm. Set |
| Measurements, mm | 3.2 | 0.1 | 2.9 | 0.1 |
| Deflection limit at design pressure, L4/175=11.2 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 Structrual 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 | |
| First sash stile | 1960 | +P = +2880 | — | — | — | — |
| | | 0 | 0.2 | 0.2 | 0.2 | <0.1 |
| | | -P = -2880 | — | — | — | — |
| | | 0 | 0.1 | 0.2 | 0.1 | 0.1 |
| Member (mm) | | Test Pressure (Pa) | Permanent deformation(mm) | | | Net permanent deformation,mm |
| Item | Span Length | | 4 | 5 | 6 | |
| Second sash stile | 1960 | +P = +2880 | — | — | — | — |
| | | 0 | 0.4 | 0.5 | 0.6 | <0.1 |
| | | -P = -2880 | — | — | — | — |
| | | 0 | 0.8 | 0.9 | 1.0 | <0.1 |
| Member (mm) | | Test Pressure (Pa) | Permanent deformation(mm) | | | Net permanent deformation,mm |
| Item | Span Length | | 7 | 8 | 9 | |
| Meeting stile of second sash | 1960 | +P = +2880 | — | — | — | — |
| | | 0 | 0.3 | 0.4 | 0.4 | 0.1 |
| | | -P = -2880 | — | — | — | — |
| | | 0 | 0.7 | 0.7 | 0.8 | 0.1 |
| Member (mm) | | Test Pressure (Pa) | Permanent deformation(mm) | | | Net permanent deformation,mm |
| Item | Span Length | | 10 | 11 | 12 | |
| Meeting stile of third sash | 1960 | +P = +2880 | — | — | — | — |
| | | 0 | 0.4 | 0.4 | 0.5 | 0.1 |
| | | -P = -2880 | — | — | — | — |
| | | 0 | 0.7 | 0.7 | 0.7 | <0.1 |

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**B.4 Uniform Load Structrual Test – Test method ASTM E330/E330M-2014, Procedure A(Cont.)**

**Table B.8 Test Data of Uniform Load Structural Test for First Sash Stile**

| Test Pressure | Perm. Set | |
|---|---|---|
| | Positive | Negative |
| Measurements, mm | <0.1 | 0.1 |
| Permanent deflection limit, L1*0.3%=5.88 mm | | |

**Table B.9 Test Data of Uniform Load Structural Test for Second Sash Stile**

| Test Pressure | Perm. Set | |
|---|---|---|
| | Positive | Negative |
| Measurements, mm | <0.1 | <0.1 |
| Permanent deflection limit, L2*0.3%=5.88 mm | | |

**Table B.10 Test Data of Uniform Load Structural Test for Meeting Stile of Second Sash**

| Test Pressure | Perm. Set | |
|---|---|---|
| | Positive | Negative |
| Measurements, mm | 0.1 | 0.1 |
| Permanent deflection limit, L3*0.3%=5.88 mm | | |

**Table B.11 Test Data of Uniform Load Structural Test for Meeting Stile of Third Sash**

| Test Pressure | Perm. Set | |
|---|---|---|
| | Positive | Negative |
| Measurements, mm | 0.1 | <0.1 |
| Permanent deflection limit, L4*0.3%=5.88 mm | | |

After the test loads were released, there was no failure or permanent deformation of any part of the door 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 Structrual Test as per AAMA/WDMA/CSA 101/I.S.2/A440-17 and CSA A440S1-19.

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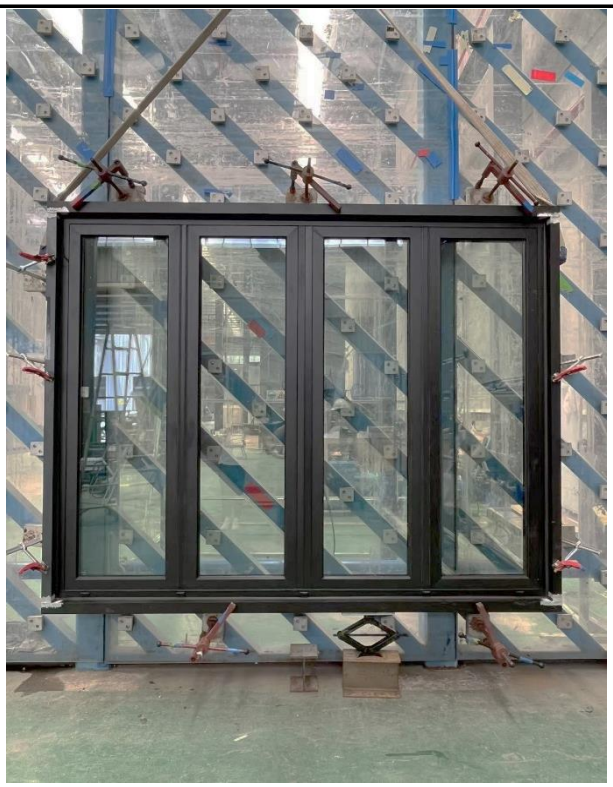
**Appendix C: Sample Received Photo**



**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 | Oliver zhu |
| Name: Ziqing Chen | Name: Oliver Zhu |
| Title: Reviewer | Title: Project Engineer |

**Revision:**

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

**End of Test Report**