Zhejiang Lokabo Intelligent Technology Co., Ltd.

TEST REPORT

SCOPE OF WORK
Lift-Sliding Window

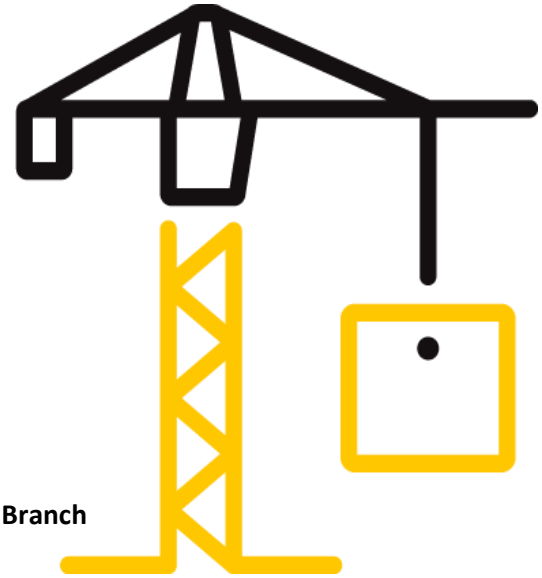
REPORT NUMBER
230704004SHF-003

TEST DATE(S)
2023-10-11 ~ 2023-10-13

ISSUE DATE
2023-10-24

PAGES
19

DOCUMENT CONTROL NUMBER
LFT-APAC-SHF-OP-10k(September 1, 2022)



Intertek Testing Services Shenzhen Ltd. Shanghai Fengxian Branch

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Test Report

Issue Date:	2023-10-24	Intertek Report No.	230704004SHF-003

Applicant:	Zhejiang Lokabo Intelligent Technology Co., Ltd.
Applicant Address:	No.26 East Yinxian Avenue, Yinzhou District, Ningbo, Zhejiang Province
Attn:	Li Shudong
Manufacturer:	Zhejiang Lokabo Intelligent Technology Co., Ltd.
Manufacturer Address:	No.26 East Yinxian Avenue, Yinzhou District, Ningbo, Zhejiang Province
Product Type:	Horizontal Sliding Window
Product Model:	T82
Primary product designator:	Class CW - PG40 - Size Tested 1800 × 1500mm (70.87 × 59.06 in.) - Type HS
Optional 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)
SUBJECT:	Performance testing Horizontal Sliding Window

Product Information

Product Name	Lift-Sliding Window	**Brand**	/
Sample Description	Good Condition	**Sample Amount**	1 set
		Received Date	2023-10-08

Sample ID	Model	Specification
S230704004SHF.003	T82	1800mm(W) x 1500mm(H)

Test Methods And Standards

Test Standard	ASTM E283/E283M-2019; ASTM E547-00 (Reapproved 2016); ASTM E330/E330M-2014(R2021); ASTM F588-17; AAMA/WDMA/CSA101/I.S.2/A440-17 Clause 9.3.1, Clause 9.3.6.3
Specification Standard	AAMA/WDMA/CSA 101/I.S.2/A440-17 (NAFS 2017 - North American Fenestration Standard / Specification for Windows, Doors and Skylights) Clause 9.3.1, Clause 9.3.2, Clause 9.3.3, Clause 9.3.4, Clause 9.3.5, Clause 9.3.6.3
Test Conclusion	The results met AAMA/WDMA/CSA 101/I.S.2/A440-17 requirements specified on Sliding Window, and the results were shown in the following page.

Note:
1.This report relates specifically to the sample(s) that were drawn and provided by the applicant or their nominated third party. The reported result(s) provide no warranty or verification on the sample(s) representing any specific goods and/or shipment and only relate to the sample(s) as received and tested.

Report Authorized

Name: Fred Bao
Title: Reviewer

Name: Gio Liu
Title: Project Engineer

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Test Report

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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 October 8th, 2023.

A full scale sample of Lift-Sliding Window (Model: T82) 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	Lift-Sliding Window
Model	T82
Dimension of Window Frame	1800mm(Width) x 1500mm(Height) x 81.2mm(Thickness)
Dimension of Window Sash	868mm(Width) x 1410mm(Height) x 42.4mm(Thickness) x 2 Pieces
Profile	Model: LT101822; LT101820; LT104821; LT104820; LT104822; LT104823 Code: 6063-T5 Supplier: Foshan Nuotuo Aluminm Co., Ltd.
Frame Corner Construction Details: Joinery type	Bevel cut, assembly with corner keys and Mechanical assembly: bonding and threaded connection (304 Stainless Steel ST4.8*41mm)
Reinforcement	Model: 1380mm(Long) x 23mm(Width) x 27mm(Thickness); 1380mm(Long) x 6mm(Width) x 32mm(Thickness) Material: Steel Supplier: Taizhou Yongbang Metal Products Co., Ltd.
Glazing	Dimension: 809mm(Width) x 1298mm(Height) x 2 Pieces Structure: 31mm thickness, 6mm + 19mm A + 6mm Tempered Insulating Glass Supplier: Jiangsu Jiacheng Special Glass Manufacturing Co., Ltd.
Hardware	Model: L330027 Supplier: Ningbo Ruichi Technology Co., Ltd.
Weather-strip	Not Applicable
Thermal Break	Model: L223400G; L223403G; L223201G; L223200G; L223202G Material: PA66GF25 Nylon insulation strip. Supplier: Ningbo Xingao Energy-saving Material Co., Ltd.
Drainage	Sizes: 32mm x 5mm(Width x Height) Quantity: 6
Gasket	Model: L440052; L440028; L440027 Material: EPDM Supplier: Ningbo Raylton Rubber&Plastic Products Co., Ltd.

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Table 1 Product Information (Continued)

Sealant of Glass	Not Applicable
Insect Screen	Not Applicable
Installation	The rough opening allowed for a 6mm shim space. The exterior perimeter of the test specimen was sealed with silicon sealant.

The sample ID number was S230704004SHF.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*
2023/10/11					
Operating Force Test AAMA/WDMA/CSA101/I.S.2/A440-17, Clause 9.3.1	Maximum force to initiate motion For Sash A	180 N	Maximum force to initiate motion For Sash A	71 N	Pass
	Maximum force to maintain motion For Sash A	115 N	Maximum force to maintain motion For Sash A	41 N	
	Maximum force to initiate motion For Sash B	180 N	Maximum force to initiate motion For Sash B	80 N	
	Maximum force to maintain motion For Sash B	115 N	Maximum force to maintain motion For Sash B	51 N	
Air Leakage Resistance Test AAMA/WDMA/CSA101/I.S.2/A440-17, Clause 9.3.2 ASTM E283/E283M-2019	Maximum air leakage at+75 Pa	1.0 $L/s \cdot m^2$	Air leakage at +75 Pa	0.76 $L/s \cdot m^2$	Pass
	Maximum air leakage at-75 Pa	1.0 $L/s \cdot m^2$	Air leakage at -75 Pa	0.79 $L/s \cdot m^2$	
Water Penetration Resistance Test AAMA/WDMA/CSA101/I.S.2/A440-17, Clause 9.3.3 ASTM E547-2000 (R2016)	Minimum water pressure	290 Pa	Test Pressure	290 Pa	Pass
			After water sprayed for four cycles in 24 minutes at 290 Pa, no water penetration was observed.		

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Table 2 Test Result (Continued)

Test Description	*Requirements (Class CW-PG40)*		*Results*		*Verdict*
2023/10/11					
Uniform Load Deflection Test AAMA/WDMA/CSA101/I.S.2/A440-17, Clause 9.3.4.2 ASTM E330/E330M-2014 (R2021)	Minimum Design Pressure (DP)	1920 Pa	Design Pressure (DP)	+1920 Pa	Pass
			Maximum deflection at Stile at handle side 1	1.4 mm	
			Maximum deflection at Mullion	3.1 mm	
			Maximum deflection at Stile at handle side 2	1.9 mm	
			Design Pressure (DP)	-1920 Pa	
			Maximum deflection at Stile at handle side 1	2.0 mm	
			Maximum deflection at Mullion	2.9 mm	
			Maximum deflection at Stile at handle side 2	2.1 mm	
Uniform Load Structural Test AAMA/WDMA/CSA101/I.S.2/A440-17, Clause 9.3.4.3 ASTM E330/E330M-2014 (R2021)	Minimum Structural Pressure (STP)	2880 Pa	Structural Pressure (STP)	+2880 Pa	Pass
			No significant breakage or damage after ultimate strength was released.		
			Maximum permanent deformation at Stile at handle side 1	0.2 mm	
			Maximum permanent deformation at Mullion	0.2 mm	
			Maximum permanent deformation at Stile at handle side 2	0.6 mm	
			Structural Pressure (STP)	-2880 Pa	
			No significant breakage or damage after ultimate strength was released.		
			Maximum permanent deformation at Stile at handle side 1	0.1 mm	
			Maximum permanent deformation at Mullion	0.2 mm	
			Maximum permanent deformation at Stile at handle side 2	0.6 mm	

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Table 2 Test Result (Continued)

Test Description	*Requirements (Class CW-PG40)*		*Results*		*Verdict*
2023/10/13					
Forced-entry Resistance Test AAMA/WDMA/CSA101/I.S.2/A440-17, Clause 9.3.5 ASTM F588-17	Minimum Grade 10		Test Class	Grade 10	Pass
			After test, there was no damage and permanent deformation.		
Deglazing Test AAMA/WDMA/CSA101/I.S.2/A440-17, Clause 9.3.6.3	Load for horizontal sash members	320N	After test, the sample does not be damaged in any way that would inhibit normal operation and there was no glazing breakage.		Pass

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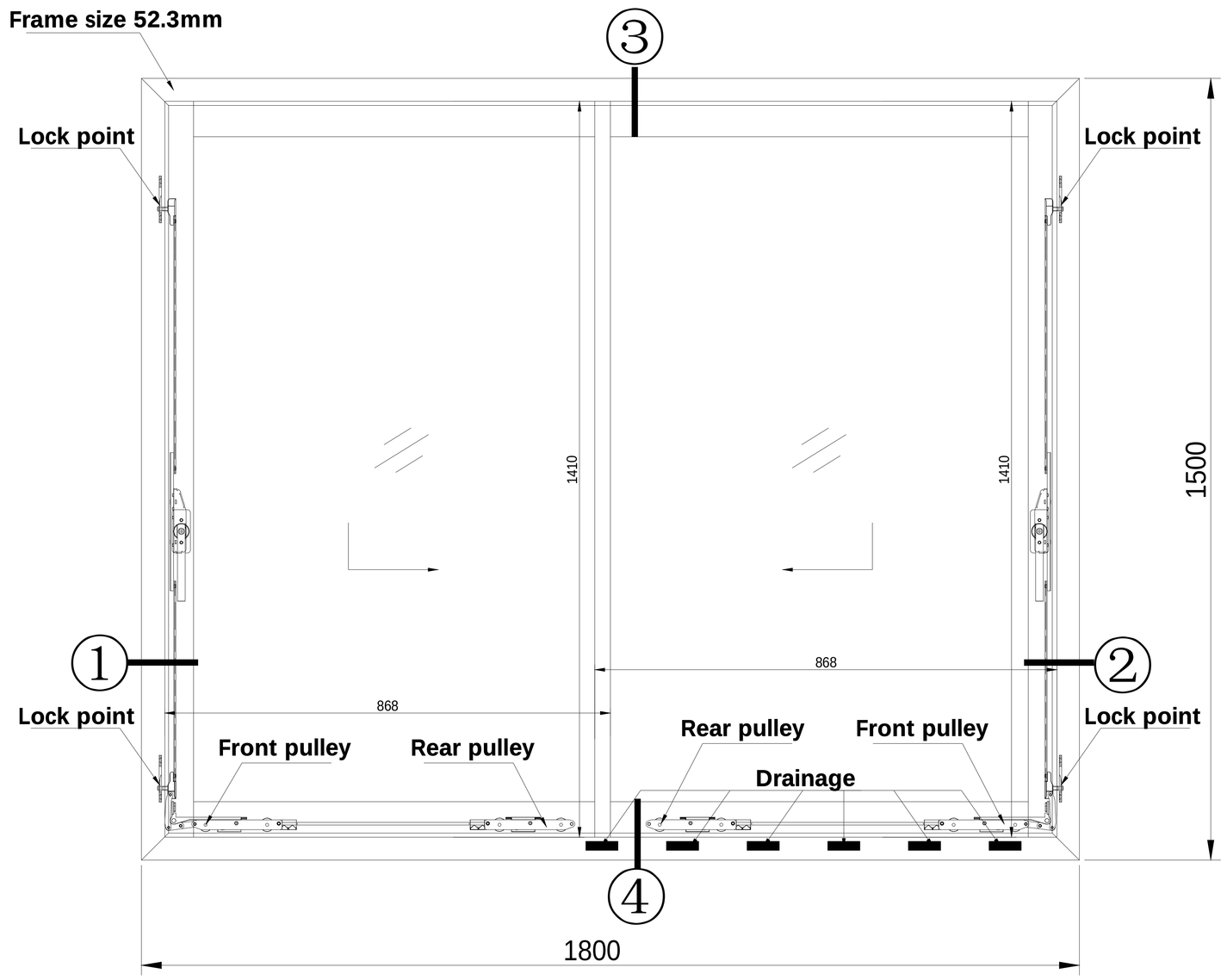
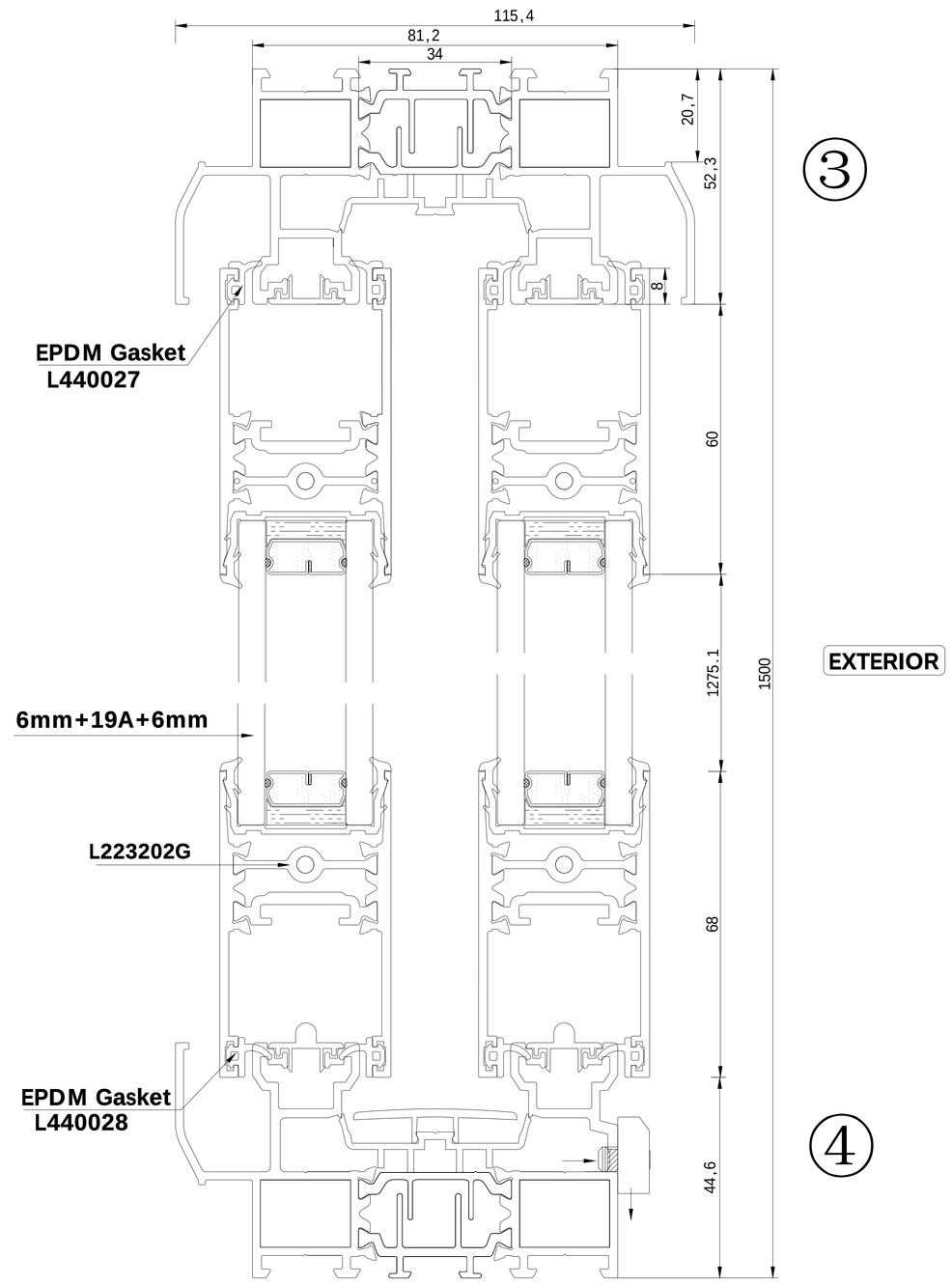
Appendix A: Sample Drawings

N82 Lift-Sliding Window





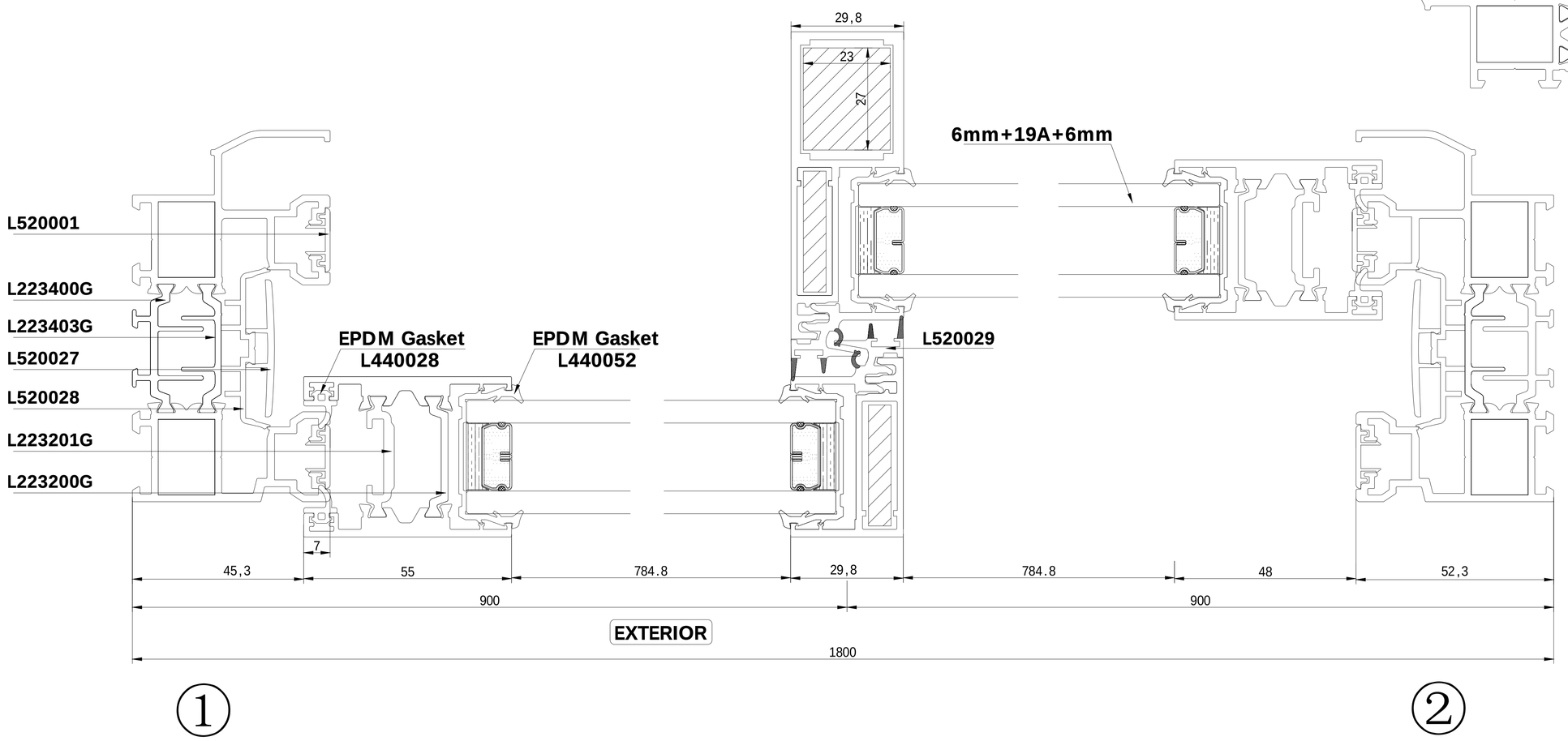


Fig.1 Drawing of Representative Sample

项目名称	美标检测T82提升推拉窗
工程地址	

LOKABO 洛卡博门窗

门窗双线内视效果图
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制 图 员	王元壮
审 核 人	
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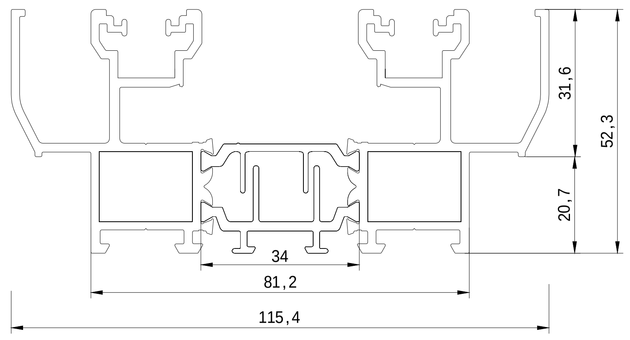
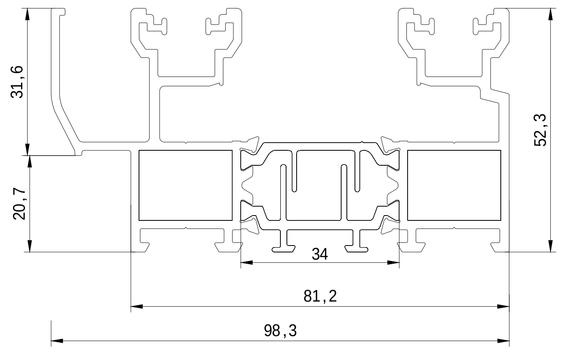
LT101822



WINDOW FRAMES

LT101820



WINDOW FRAMES

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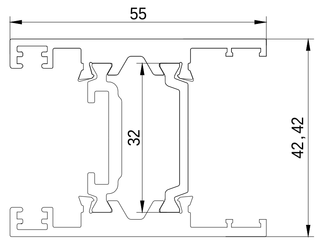
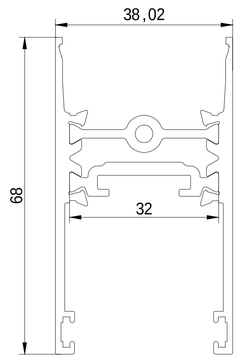


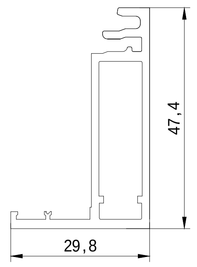
WINDOW SASH

LT104820



WINDOW SASH

LT104822



WINDOW SASH

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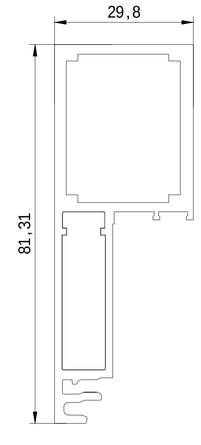

WINDOW SASH

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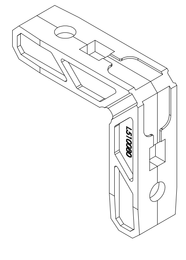

ANGLE CODE

GLASS @ OPERABLE VENT

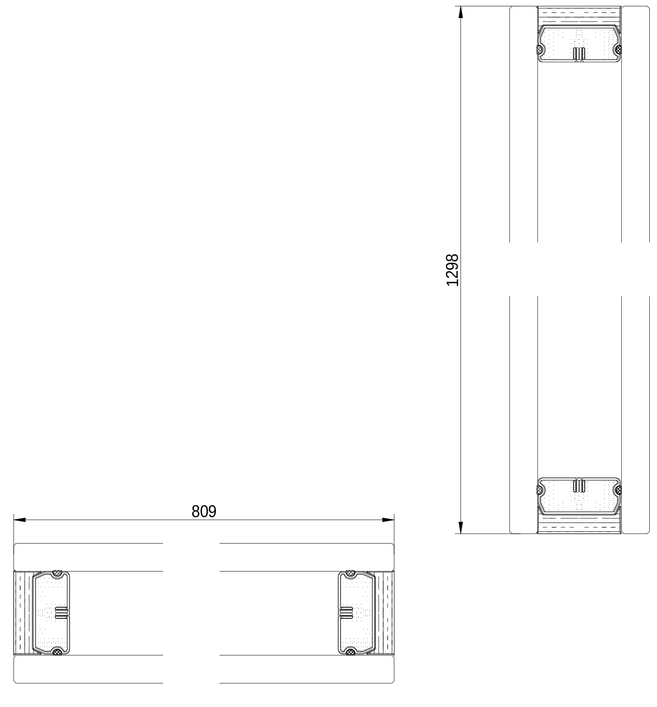

Fig.2 Drawing of Representative Sample

项目名称	美标检测T82提升推拉窗
工程地址	

LOKABO 洛卡博门窗

门窗双线内视效果图

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制 图 员	王元壮
审 核 人	
复 核 人	

技术说明：
1.图中尺寸为成窗尺寸

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HARDWARE DRAWINGS, Example

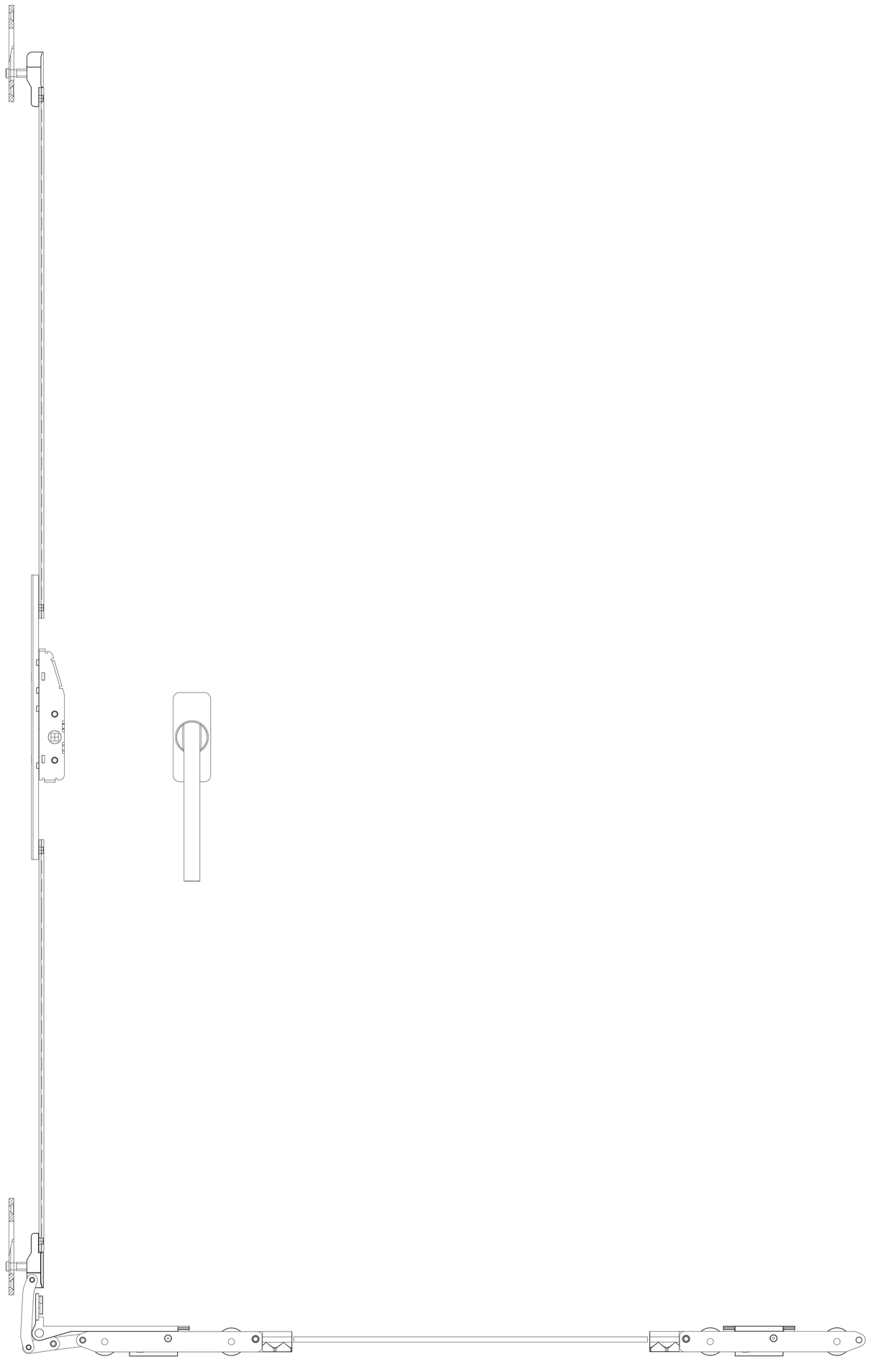

Fig.3 Drawing of Representative Sample

项目名称	美标检测T82提升推拉窗
工程地址	

LOKABO 洛卡博门窗

门窗双线内视效果图

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Test Report

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Appendix B: Test Data

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

Ovearall area: 2.70 m^2

Table B.1 Test Data of Air Leakage Resistance Test

Infiltration rate (75 Pa)	0.76 $L/s \cdot m^2$	0.15 cfm/ft^2
Exfiltration rate (75 Pa)	0.79 $L/s \cdot m^2$	0.16 cfm/ft^2
Average air leakage rate (75 Pa)	0.78 $L/s \cdot m^2$	0.16 cfm/ft^2
Requirements (75 Pa): Maximum allowable leakage for Class CW Windows	1.0 $L/s \cdot m^2$	0.20 cfm/ft^2

The tested specimen met the requirements for Class CW for Air Leakage Resistance Test as per AAMA/WDMA/CSA 101/I.S.2/A440-17.

Appendix B: Test Data

B.2 Water resistance test – Test method ASTM E547-00 (Reapproved 2016)

No water penetration occurred when the pressure was 290 Pa (6.06 psf).

After water sprayed for four cycles in 24 minutes at 290 Pa, no water penetration was observed.

Test result: P_{max} = 290 Pa (6.06 psf).

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

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Appendix B: Test Data

B.3 Uniform Load Deflection Test – Test method ASTM E330/E330M-2014(R2021), Procedure A

Span length, L = 1360 mm Set Points (1-3)
Span length, L = 1360 mm Set Points (4-6)
Span length, L = 1360 mm Set Points (7-9)

Test Pressure (DP), P = 1920 Pa (40.10 psf)

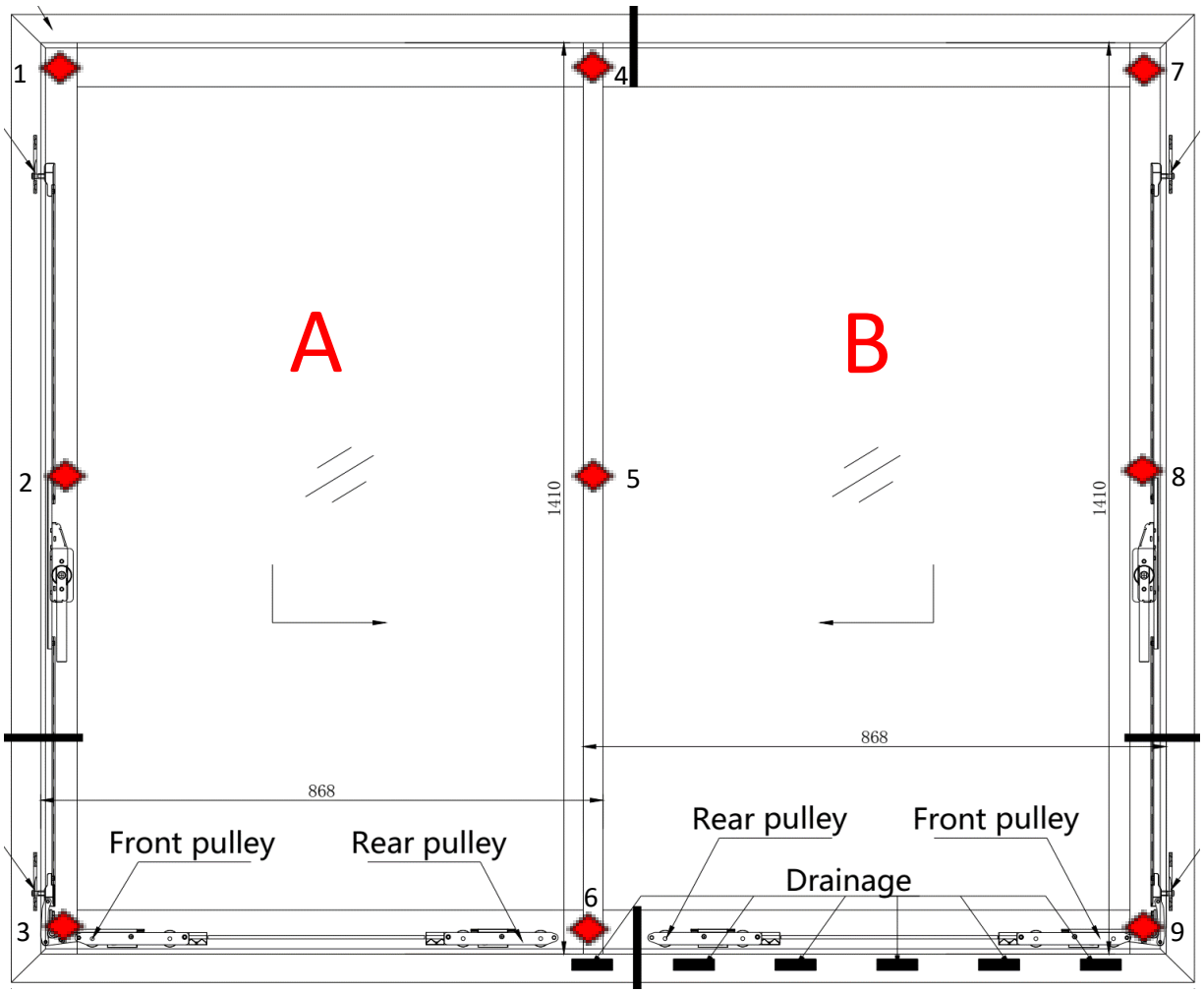

Fig.4 Locations of Displacement Measuring Devices

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Table B.2 Test Data of Uniform Load Deflection Test

Member (mm)		Test Pressure (Pa)	Deflection (mm)			Maximum Deflection(mm)
Item	Span Length		1	2	3	
Stile at handle side 1	1360	+P = 1920	1.9	2.9	1.1	1.4
		0	1.0	0.8	0.5	0.1
		-P = -1920	2.6	4.1	1.7	2.0
		0	1.0	0.8	0.5	0.1
Member (mm)		Test Pressure (Pa)	Deflection (mm)			Maximum Deflection(mm)
Item	Span Length		4	5	6	
Mullion	1360	+P = 1920	2.3	5.7	2.9	3.1
		0	0.8	0.9	0.8	0.1
		-P = -1920	2.3	5.8	3.6	2.9
		0	0.8	1.0	0.9	0.2
Member (mm)		Test Pressure (Pa)	Deflection (mm)			Maximum Deflection(mm)
Item	Span Length		7	8	9	
Stile at handle side 2	1360	+P = 1920	1.9	3.0	1.3	1.9
		0	0.6	1.1	0.7	0.5
		-P = -1920	1.0	3.3	1.5	2.1
		0	0.5	1.1	0.7	0.5

Table B.3 Test Data of Uniform Load Deflection Test for Stile at handle side 1

Test Pressure	Deflection Measurements, mm (in.)			
	Positive		Negative	
	Maximum Deflection		Maximum Deflection	
1920 Pa 40.10 psf)	1.4	(0.06)	2.0	(0.08)
Span length, L = 1360 mm (53.54 in.)		Deflection limit L/175 = 7.8 mm (0.31 in.)		

Table B.4 Test Data of Uniform Load Deflection Test for Mullion

Test Pressure	Deflection Measurements, mm (in.)			
	Positive		Negative	
	Maximum Deflection		Maximum Deflection	
1920 Pa (40.10 psf)	3.1	(0.12)	2.9	(0.11)
Span length, L = 1360 mm (53.54 in.)		Deflection limit L/175 = 7.8 mm (0.31 in.)		

Table B.5 Test Data of Uniform Load Deflection Test for Stile at handle side 2

Test Pressure	Deflection Measurements, mm (in.)			
	Positive		Negative	
	Maximum Deflection		Maximum Deflection	
1920 Pa (40.10 psf)	1.9	(0.07)	2.1	(0.08)
Span length, L = 1360 mm (53.54 in.)		Deflection limit L/175 = 7.8 mm (0.31 in.)		

The tested specimen met the requirements for Class CW-PG40 for Uniform Load deflection Test at design pressure as per AAMA/WDMA/CSA 101/I.S.2/A440-17.

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Appendix B: Test Data

B.4 Uniform Load Structrual Test – Test method ASTM E330/E330M-2014(R2021), Procedure A

Design Pressure, P = 1920 Pa (40.10 psf)

Structural Pressure, P = 2880 Pa (60.15 psf)

Table B.6 Test Data of Uniform Load Structural Test

Member (mm)		Test Pressure (Pa)	Permanent deformation(mm)			Maximum permanent deformation(mm)
Item	Span Length		1	2	3	
Stile at handle side 1	1360	+P = 2880	–	–	–	–
		0	1.2	1.1	0.7	0.2
		-P = -2880	–	–	–	–
		0	1.4	1.2	0.8	0.1
Permanent Deformation limit, L x 0.3% = 4.1 mm						
Member (mm)		Test Pressure (Pa)	Permanent deformation(mm)			Maximum permanent deformation(mm)
Item	Span Length		4	5	6	
Mullion	1360	+P = 2880	–	–	–	–
		0	1.0	1.2	1.1	0.2
		-P = -2880	–	–	–	–
		0	1.0	1.4	1.5	0.2
Permanent Deformation limit, L x 0.3% = 4.1 mm						
Member (mm)		Test Pressure (Pa)	Permanent deformation(mm)			Maximum permanent deformation(mm)
Item	Span Length		7	8	9	
Stile at handle side 2	1360	+P = 2880	–	–	–	–
		0	0.6	1.3	0.9	0.6
		-P = -2880	–	–	–	–
		0	0.7	1.4	1.0	0.6
Permanent Deformation limit, L x 0.3% = 4.1 mm						

Table B.7 Test Data of Uniform Load Structural Test For Stile at handle side 1

Test Pressure	Deflection Measurements, mm (in.)			
	Positive		Negative	
	Perm. Set		Perm. Set	
2880 Pa (60.15 psf)	0.2	(0.01)	0.1	(<0.01)

Table B.8 Test Data of Uniform Load Structural Test For Mullion

Test Pressure	Deflection Measurements, mm (in.)			
	Positive		Negative	
	Perm. Set		Perm. Set	
2880 Pa (60.15 psf)	0.2	(0.01)	0.2	(0.01)

Test Report

Issue Date: 2023-10-24 Intertek Report No. 230704004SHF-003

Table B.9 Test Data of Uniform Load Structural Test For Stile at handle side 2

Test Pressure	Deflection Measurements, mm (in.)			
	Positive		Negative	
	Perm. Set		Perm. Set	
2880 Pa (60.15 psf)	0.6	(0.02)	0.6	(0.02)

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 for Class CW-PG40 for Uniform Load Structure Test as per AAMA/WDMA/CSA 101/I.S.2/A440-17.

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Appendix C: Sample Received Photo

Revision:

NO.	Date	Changes
230704004SHF-003	2023-10-24	First issue