Zhejiang Lokabo Intelligent Technology Co., Ltd.

TEST REPORT

SCOPE OF WORK
Dual-action Window

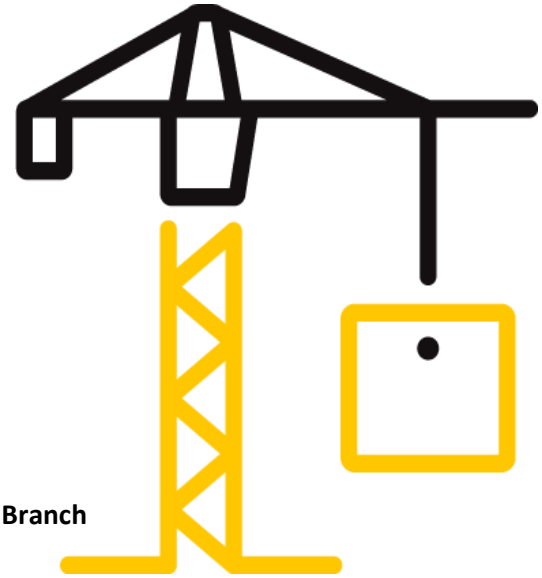
REPORT NUMBER
230704004SHF-002

TEST DATE(S)
2023-08-01 - 2023-08-04

ISSUE DATE
2023-08-17

PAGES
16

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



Intertek Testing Services Shenzhen Ltd. Shanghai Fengxian Branch

Test Report

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Test Report

Issue Date:	2023-08-17	Intertek Report No.	230704004SHF-002

Applicant:	Zhejiang Lokabo Intelligent Technology Co., Ltd.
Applicant Address:	No.26 East Yinxian Avenue, Yinzhou District, Ningbo, Zhejiang Province
Attn:	Li Shu Dong
Manufacturer:	Zhejiang Lokabo Intelligent Technology Co., Ltd.
Manufacturer Address:	No.26 East Yinxian Avenue, Yinzhou District, Ningbo, Zhejiang Province
Product Type:	Dual-action Window
Product Model:	N82
Primary product designator:	Class CW - PG50 - Size Tested 1200 × 1800 mm (47.24 × 70.87 in.) - Type DAW
Optional secondary designator:	Positive Design Pressure = +2400 Pa (50.13 psf) Negative Design Pressure = -2400 Pa (50.13 psf) Water penetration resistance test pressure = 360 Pa (7.52 psf)
SUBJECT:	Performance testing Dual-action Window

Product Information

Product Name	Dual-action Window	**Brand**	/
Sample Description	Good Condition	**Sample Amount**	1 set
		Received Date	2023-07-04
Sample ID	**Model**	**Specification**	
S230704004SHF.002	N82	1200mm(W) x 1800mm(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 9.3.6.4.3, Clause 9.3.6.5.3
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 9.3.6.4.3 and Clause 9.3.6.5.3
Test Conclusion	The results met AAMA/WDMA/CSA 101/I.S.2/A440-17 requirements specified on Dual-action 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

Test Report

Issue Date: 2023-08-17 Intertek Report No. 230704004SHF-002

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 July 4, 2023.

A full scale sample of Dual-action Window (Model: N82) 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	Dual-action Window
Model	N82
Dimension of Window Frame	1200mm (Width) x 1800mm (Height) x 81.2mm (Thickness)
Dimension of Window Sash	1153mm (Width) x 1753mm (Height) x 91mm (Thickness)
Profile	Model: KL101060; KL104120; KL105350 Code: 6063-T5 Supplier: Foshan Nuotuo Aluminm Co., Ltd.
Frame Corner Construction Details: Joinery type	Miter-cut, assembly with corners keys
Reinforcement	None
Glazing	Dimension: 1047mm (Width) x 1647mm (Height) Structure: 31mm Thick, 6mm + 19mm A + 6mm Tempered Insulating Glass Supplier: Jiangsu Jiacheng Special Glass Manufacturing Co., Ltd.
Hardware	Lock Model: 30140-30 Chain Model: 32115-10R Hinge Model: 35510-1 Supplier: Shanghai Soo Building Materials Co., Ltd.
Weather-strip	Not Applicable
Thermal Break	Model: L223400G; L223401G Material: PA66GF25 Nylon Insulation Strip. Supplier: Ningbo Xingao Energy-saving Material Co.,Ltd.
Drainage	None
Gasket	Model: L440016; L440018; L440024G; L440023; L440011 Material: EPDM Supplier: Ningbo Raylton Rubber & Plastic Products Co.,Ltd.
Sealant of Glass	Model: Neutral Silicone Weather Resistance 25HM Black Material: Silicone Sealant Supplier: Würth (China) Co., Ltd.
Installation	The rough opening allowed for a a 6 mm shim space. The exterior perimeter of the test specimen was sealed with silicon sealant.

The sample ID number was S230704004SHF.002. 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-PG50)*		*Results*		*Verdict*
2023/8/1					
Operating Force Test AAMA/WDMA/CSA101/I.S.2/A440-17, Clause 9.3.1	Maximum force to initiate motion (Turn inward operation)	155 N	Maximum force to initiate motion (Turn inward operation)	31 N	Pass
	Maximum force to maintain motion (Turn inward operation)	135 N	Maximum force to maintain motion (Turn inward operation)	22 N	
Operating Force Test AAMA/WDMA/CSA101/I.S.2/A440-17, Clause 9.3.1	Maximum force to initiate motion (Tilt inward operation)	155 N	Maximum force to initiate motion (Tilt inward operation)	35 N	Pass
	Maximum force to maintain motion (Tilt inward operation)	135 N	Maximum force to maintain motion (Tilt inward operation)	26 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	0.50 L/s·m^2	Air leakage at +75 Pa	0.15 L/s·m^2	Pass
	Maximum air leakage at-75 Pa	0.50 L/s·m^2	Air leakage at -75 Pa	0.17 L/s·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	360 Pa	Test Pressure	360 Pa	Pass
			After water sprayed for four cycles in 24 minutes at 360 Pa, no water penetration was observed.		

Test Report

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Table 2 Test Result (Continued)

Test Description	*Requirements (Class CW-PG50)*		*Results*		*Verdict*
2023/8/2					
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)	2400 Pa	Design Pressure (DP)	+2400 Pa	Pass
			Maximum deflection at Stile at handle side	0.8 mm	
			Maximum deflection at Bottom Rail	0.7 mm	
			Design Pressure (DP)	-2400 Pa	
			Maximum deflection at Stile at handle side	0.1 mm	
			Maximum deflection at Bottom Rail	0.7 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)	3600 Pa	Structural Pressure (STP)	+3600 Pa	Pass
			No significant breakage or damage after ultimate strength was released.		
			Maximum permanent deformation at Stile at handle side	0.2 mm	
			Maximum permanent deformation at Bottom Rail	0.2 mm	
			Structural Pressure (STP)	-3600 Pa	
			No significant breakage or damage after ultimate strength was released.		
			Maximum permanent deformation at Stile at handle side	1.3 mm	
			Maximum permanent deformation at Bottom Rail	0.3 mm	

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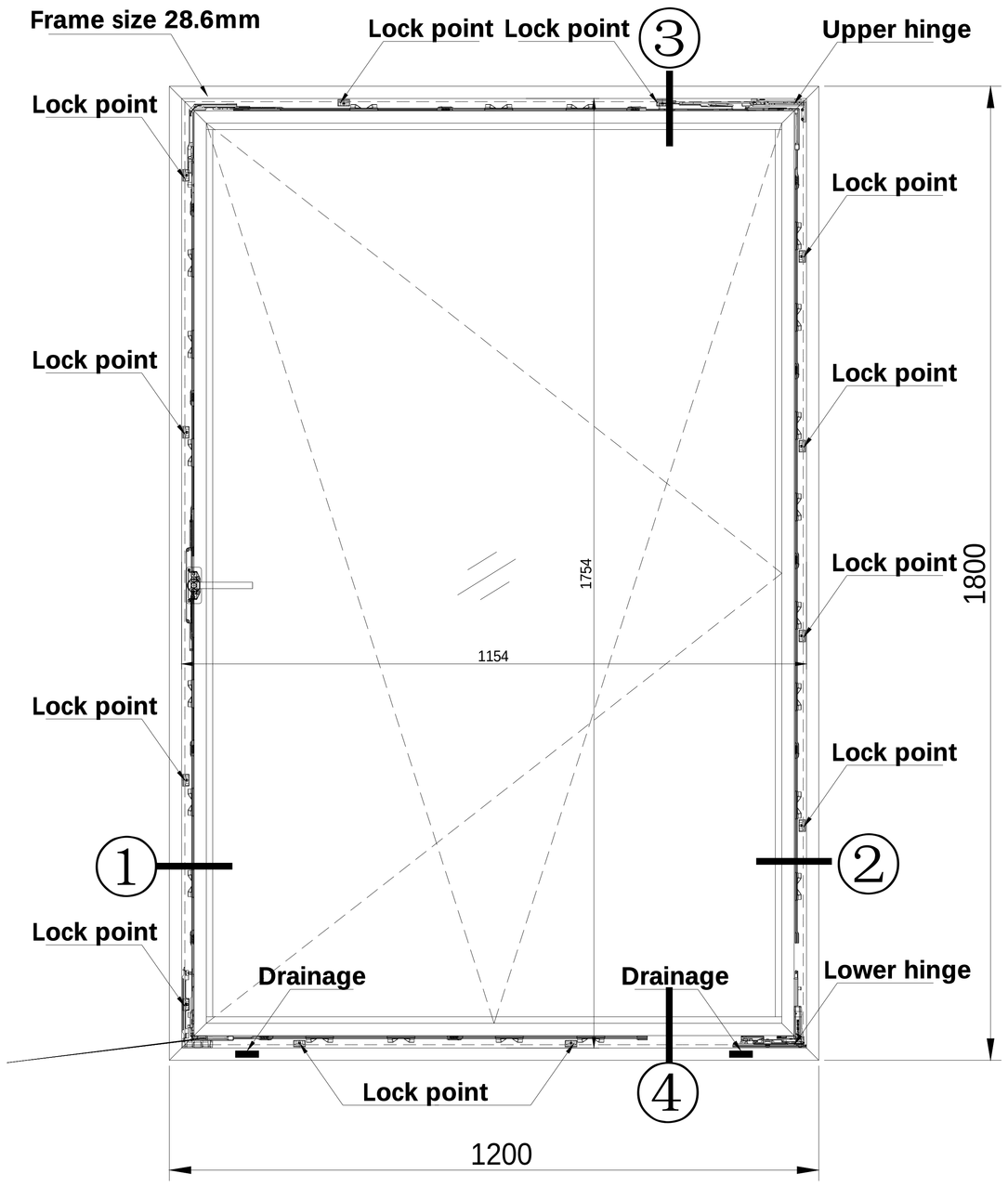
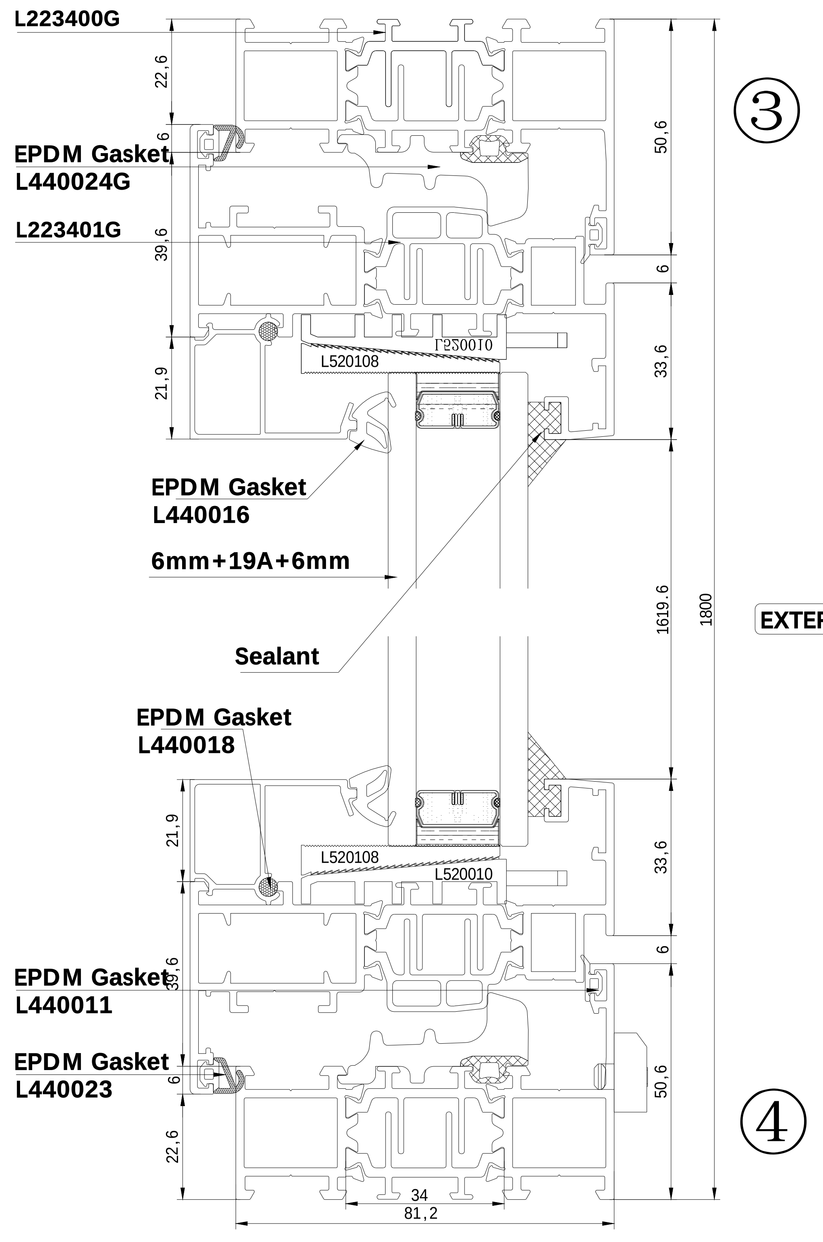
Table 2 Test Result (Continued)

Test Description	*Requirements (Class CW-PG50)*		*Results*		*Verdict*
2023/8/3					
Stabilizing Arm Load Test AAMA/WDMA/CSA101/I.S.2/A440-17, Clause 9.3.6.5.3	Load vertically to sash or leaf corner	890 N	After test, there was no damage or permanent deformation, the window was still operable.		Pass
	Load vertically to sash or leaf top rail at center	1780 N			
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 entry or permanent deformation, the window was still operable.		
2023/8/4					
Sash/leaf Concentrated Load Test on Latch Rail AAMA/WDMA/CSA101/I.S.2/A440-17, Clause 9.3.6.4.3	Maximum deflection at the perpendicular load of 135N: 1.5 mm		0.15 mm		Pass
	Maximum deflection at the parallel load of 230N: 3.3 mm		0.17 mm		

Appendix A: Sample Drawings

N82 Tilt&Turn Window





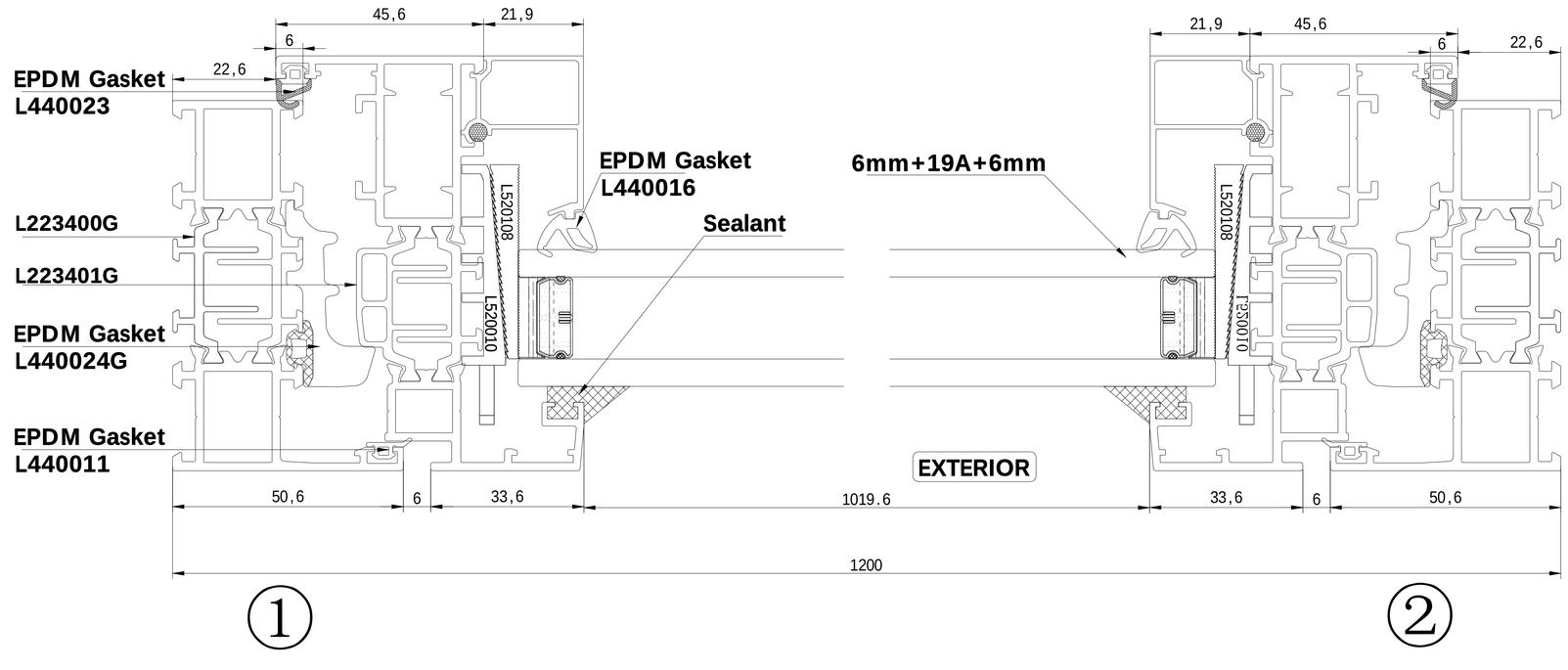


Fig.1 Drawing of Representative Sample

项目名称	美标检测N82N内开内倒
工程地址	

LOKABO 洛卡博门窗

门窗双线内视效果图 ★★★

此页特殊备注

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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

签字确认：

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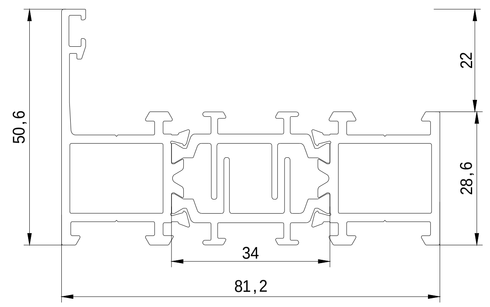
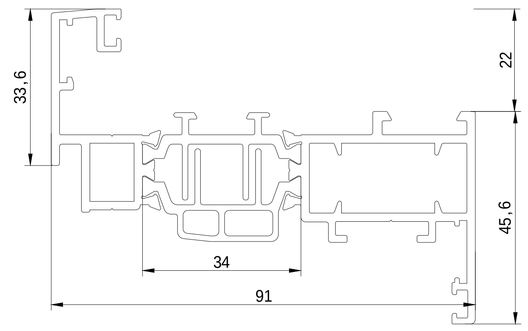
Report #: 230704004SHF-002
Date: 08/17/23
Verified by:

KL101060



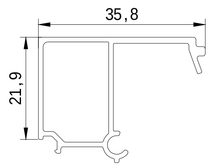
WINDOW FRAMES

KL104120



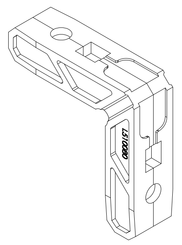
WINDOW SASH

KL105350



GLAZING BEAD

L510080



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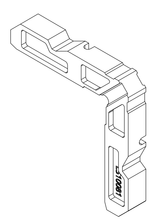
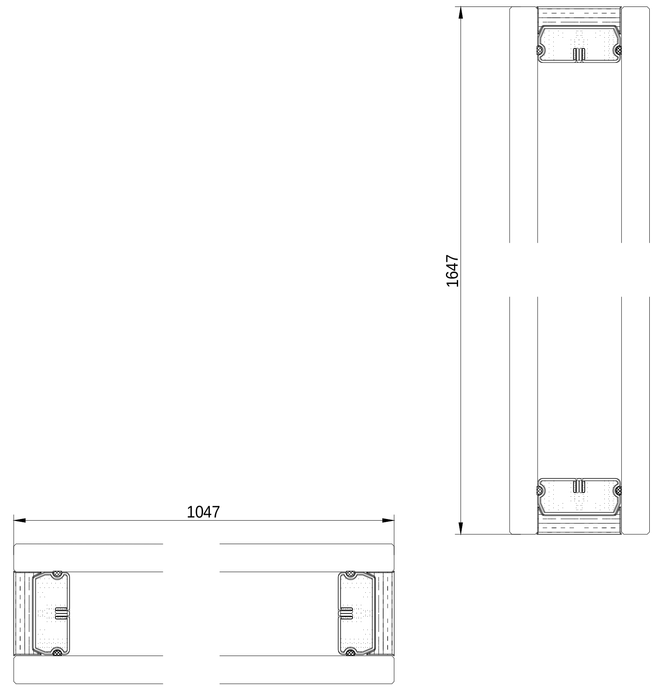


ANGLE CODE

GLASS @ OPERABLE VENT



HARDWARE DRAWINGS, Example

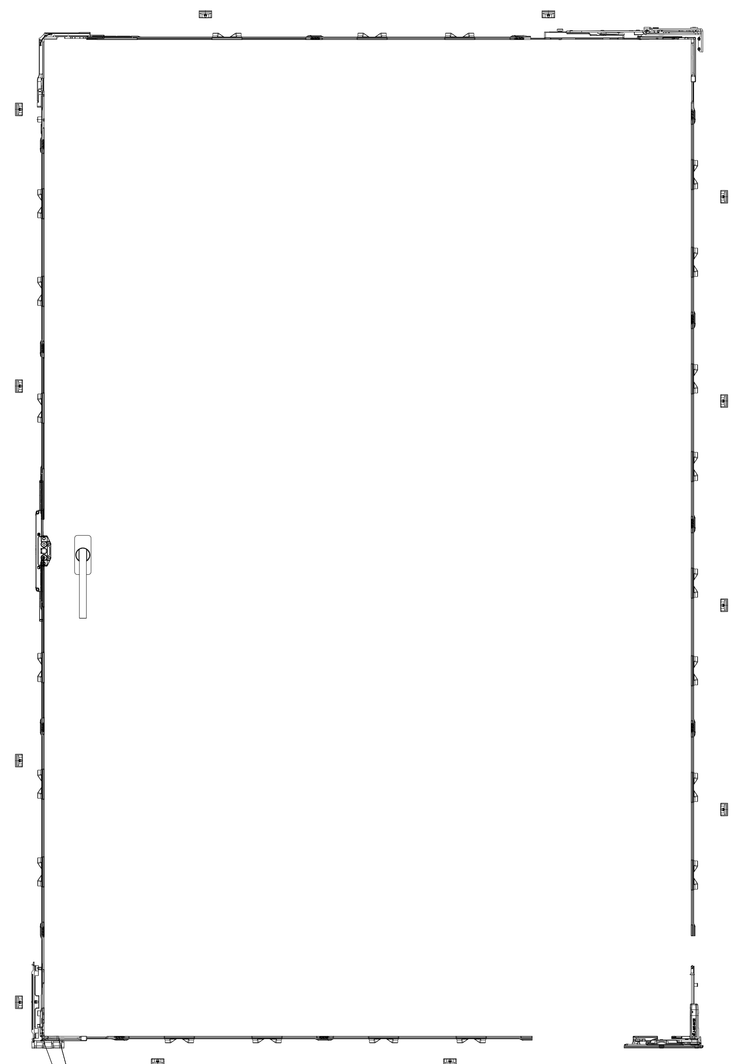


Fig.2 Drawing of Representative Sample

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Date: 08/17/23
Verified by:

项目名称	美标检测N82N内开内倒
工程地址	

LOKABO 洛卡博门窗

门窗双线内视效果图

此页特殊备注

注意：

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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

签字确认：

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Appendix B: Test Data

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

Overall area: 2.16 m^2

Table B.1 Test Data of Air Leakage Resistance Test

Infiltration rate (75 Pa)	0.15 $L/s \cdot m^2$	0.03 cfm/ft^2
Exfiltration rate (75 Pa)	0.17 $L/s \cdot m^2$	0.03 cfm/ft^2
Average air leakage rate (75 Pa)	0.16 $L/s \cdot m^2$	0.03 cfm/ft^2
Requirements: Air leakage rate for Class CW of Windows (75 Pa)	0.5 $L/s \cdot m^2$	0.1 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 360 Pa (7.52 psf).

After water sprayed for four cycles in 24 minutes at 360 Pa, no water penetration was observed.

Test result: P_{max} = 360 Pa (7.52 psf).

The tested specimen met the requirements for Class CW-PG50 for Water Penetration Resistance Test as per AAMA/WDMA/CSA 101/I.S.2/A440-17.

Appendix B: Test Data

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

Span length, L = 1650 mm Set Points (1-3)

Span length, L = 1040 mm Set Points (3-5)

Test Pressure (DP), P = 2400 Pa (50.13 psf)

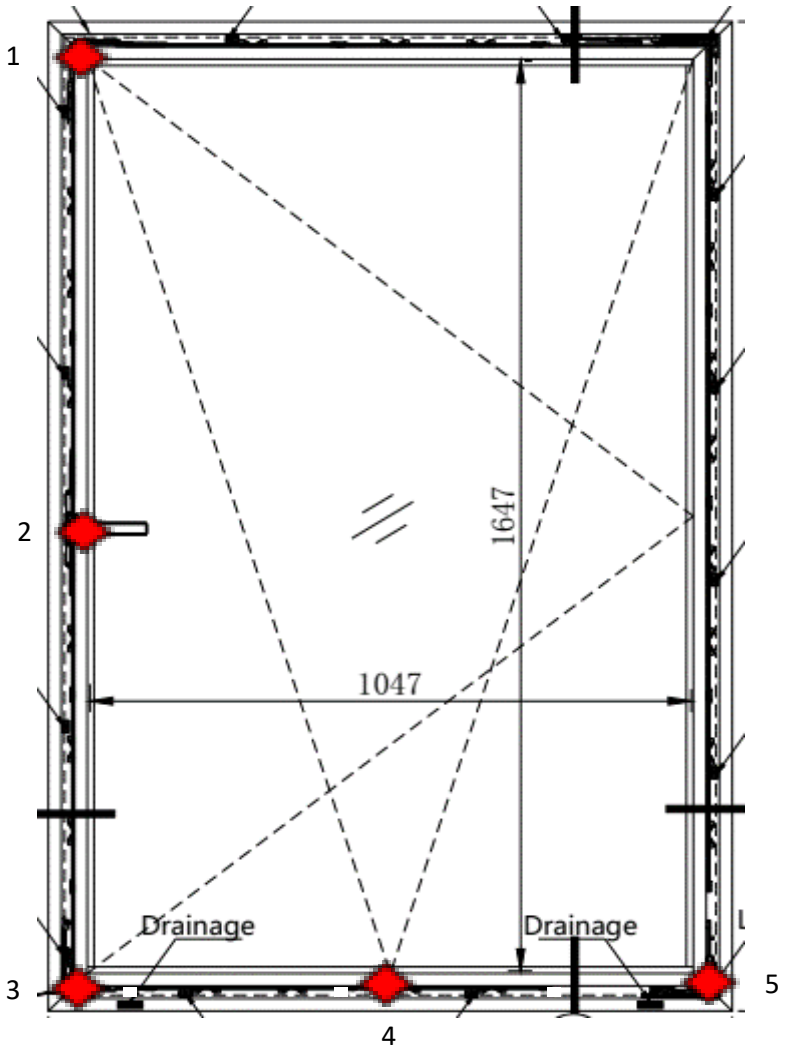

Fig.3 Locations of Displacement Measuring Devices

Test Report

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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	1650	+P = 2400	0.6	1.2	0.3	0.8
		0	<0.1	0.2	<0.1	0.2
		-P = -2400	0.6	0.7	0.6	0.1
		0	<0.1	0.1	0.1	0.1
Member (mm)		Test Pressure (Pa)	Deflection (mm)			Maximum Deflection(mm)
Item	Span Length		3	4	5	
Bottom Rail	1040	+P = 2400	0.3	1.1	0.5	0.7
		0	<0.1	0.1	0.1	0.1
		-P = -2400	0.6	1.3	0.7	0.7
		0	0.1	0.2	0.2	0.1

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

Test Pressure	Deflection Measurements, mm (in.)			
	Positive		Negative	
	Maximum Deflection		Maximum Deflection	
2400 Pa (50.13 psf)	0.8	(0.03)	0.1	(<0.01)
Span length, L = 1650 mm (64.96 in.)		Deflection limit L/175 = 9.4 mm (0.37 in.)		

Table B.4 Test Data of Uniform Load Deflection Test for Bottom Rail

Test Pressure	Deflection Measurements, mm (in.)			
	Positive		Negative	
	Maximum Deflection		Maximum Deflection	
2400 Pa (50.13 psf)	0.7	(0.03)	0.7	(0.03)
Span length, L = 1040 mm (40.94 in.)		Deflection limit L/175 = 5.9 mm (0.23 in.)		

The tested specimen met the requirements for Class CW-PG50 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 = 2400 Pa (50.13 psf)

Structural Pressure, P = 3600 Pa (75.19 psf)

Table B.5 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	1650	+P = 3600	–	–	–	–
		0	<0.1	0.2	0.1	0.2
		-P = -3600	–	–	–	–
		0	0.2	1.4	0.1	1.3
Permanent Deformation limit, L x 0.3% = 5.0 mm						
Member (mm)		Test Pressure (Pa)	Permanent deformation(mm)			Maximum permanent deformation(mm)
Item	Span Length		3	4	5	
Bottom Rail	1040	+P = 3600	–	–	–	–
		0	0.1	0.3	0.2	0.2
		-P = -3600	–	–	–	–
		0	0.1	0.4	0.2	0.3
Permanent Deformation limit, L x 0.3% = 3.1 mm						

Table B.6 Test Data of Uniform Load Structural Test For Stile at handle side

Test Pressure	Deflection Measurements, mm (in.)			
	Positive		Negative	
	Perm. Set		Perm. Set	
3600 Pa (75.19 psf)	0.2	(0.01)	1.3	(0.05)

Table B.7 Test Data of Uniform Load Structural Test For Bottom Rail

Test Pressure	Deflection Measurements, mm (in.)			
	Positive		Negative	
	Perm. Set		Perm. Set	
3600 Pa (75.19 psf)	0.2	(0.01)	0.3	(0.01)

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-PG50 for Uniform Load Structure Test as per AAMA/WDMA/CSA 101/I.S.2/A440-17.

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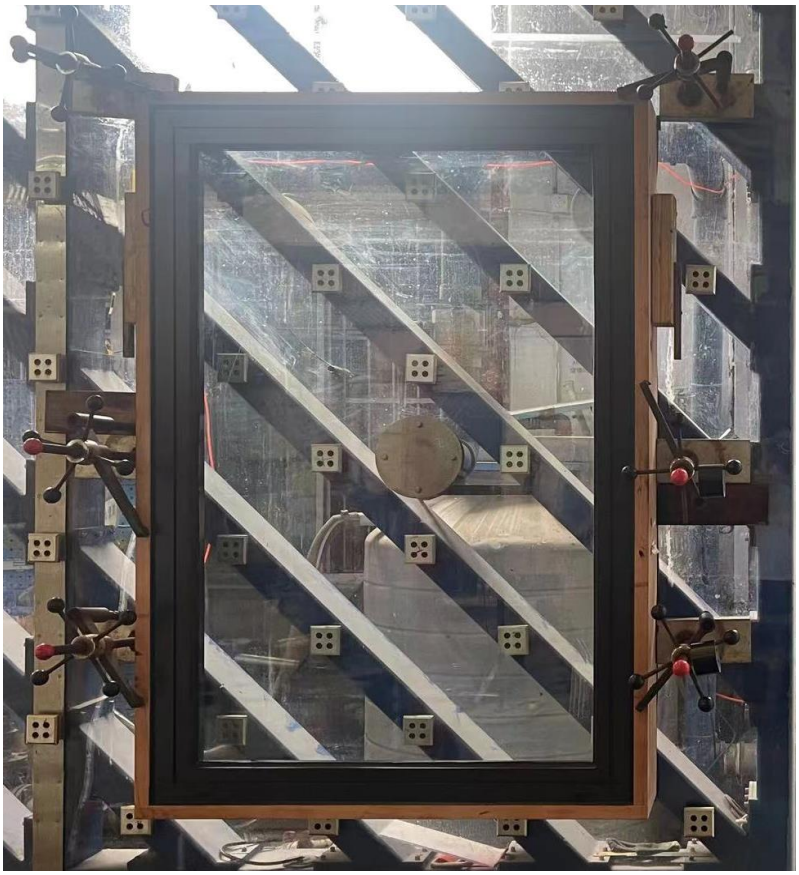
Appendix C: Sample Received Photo



Revision:

NO.	Date	Changes
230704004SHF-002	2023-08-17	First issue