

Rangi Windows Ltd.

TEST REPORT

SCOPE OF WORK

Aluminum Awning Window + Fixed

REPORT NUMBER

230612020SHF-001

TEST DATE(S)

2023-06-28 - 2023-06-30

ISSUE DATE

2023-07-04

PAGES

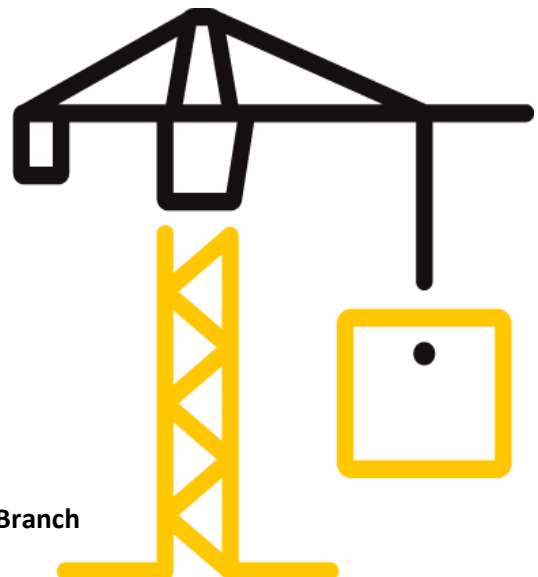
14

DOCUMENT CONTROL NUMBER

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

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Intertek Testing Services Shenzhen Ltd. Shanghai Fengxian Branch



Test Report

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Test Report

Issue Date: 2023-07-04 Intertek Report No. 230612020SHF-001
 Applicant: Rangi Windows Ltd.
 Address: 25 Stock St., New Lynn, Auckland
 Attn: Vivien Li
 Test Type: Performance test, samples provided by the applicant.

Product Information

Product Name	Aluminum Awning Window + Fixed	Brand	RANGI WINDOWS
Sample Description	Good Condition	Sample Amount	1 set
		Received Date	2023-06-12
Sample ID	Model	Specification	
S230612020SHF.001	ARCHER 70	1600 mm (Width) × 1200 mm (Height)	

Test Methods And Standards

Test Standard	AS/NZS 4420.1-2016 Windows, external glazed, timber and composite doors - Methods of test Part 1: Test sequence, sampling and test methods; SNZ TS 4211:2022 Standards New Zealand Technical Specification - Specification for the classification of windows Section 5.8
Specification Standard	SNZ TS 4211:2022 Standards New Zealand Technical Specification - Specification for the classification of windows
Test Conclusion	The results conform to the applicable requirements of SNZ TS 4211:2022, and the results are 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 Name: Gio Liu
 Title: Reviewer Title: Project Engineer

Test Report

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Test Items, Method and Results:

1 Test Samples

A full scale of sample 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

1	Product Name	Aluminum Awning Window + Fixed
2	Model	ARCHER 70
3	Dimension of Window Frame	1600mm(Width) × 1200mm(Height) × 69.5mm(Thickness)
4	Dimension of Window Sash	Operable Sash: 657mm(Width) × 1132mm(Height) × 39mm(Thickness) Fixed Part: 900mm(Width) × 1200mm(Height) × 69.5mm(Thickness)
5	Profile	Model: ARCHER 70 Code: 6063-T5 Manufacturer: Huaping Aluminum
6	Frame Corner Construction Details: Joinery Type	Mitre cut, mechanically assembled: Glued & screwed, Screw size: 3.8*25mm (Dia & Length)
7	Reinforcement	None
8	Glazing	Dimension: Operable: 567mm(Width) x 1042mm(Height) Fixed: 835mm(Width) x 1110mm(Height) Structure: 24mm Thickness, 5mm + 14mm Air + 5mm Tempered Glass Supplier: Jiangmen Junfa Safety Glass Co., Ltd.
9	Hardware	Handle Model: DS801APW Hinge Model: FS004 Supplier: Doric Products (NZ) Ltd
10	Weather Bar	Not Applicable
11	Thermal Break	Not Applicable
12	Drainage	Size: 30mm × 5mm(Width × Height); Quantity: 4
13	Gasket	Model: W003 Material: EPDM Supplier: Doric Products (NZ) Ltd
14	Sealant of Glass	Model: FB777A Material: Silicone sealant Supplier: Glasscorp Ltd
15	Installation	The rough opening allowed for a 6 mm shim space. The exterior perimeter of the test specimen was sealed with silicon sealant.

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Test Items, Method and Results:

2 Test Result

Table 2 Test Results

Test Description	Test Result		Verdict	
Serviceability Design Wind Pressure AS/NZS 4420.1-2016 Section 3	±	970 Pa	Pass	
Deflection / Span Ratio Framing member 1	Stile	1/1189		
Deflection / Span Ratio Framing member 2	Rail at handle side	1/1967		
Deflection / Span Ratio Framing member 3	Mullion	1/1529		
Deflection / Span Ratio Framing member 4	Glazing	1/760	Reported ¹	
Operating Force AS/NZS 4420.1-2016 Section 4	Initial Movement	Required	≤ 100 N	Pass
		Open	33 N	
		Close	34 N	
	Maintain Movement	Required	≤ 100 N	
		Open	19 N	
		Close	20 N	
Air Permeability at ± 75 Pa & ± 150 Pa AS/NZS 4420.1-2016 Section 5	Air Permeability Test of Area (Overall area: 1.92 m ²)	at +75 Pa	0.02 L/s·m ²	Pass
		at -75 Pa	0.02 L/s·m ²	
		at +150 Pa	0.03 L/s·m ²	
		at -150 Pa	0.05 L/s·m ²	
	Air Permeability Class		4	
	Air Permeability Test of Opening Joint (Joint Length: 3.58 m)	at +75 Pa	0.01 L/s·m	
		at -75 Pa	0.01 L/s·m	
		at +150 Pa	0.02 L/s·m	
		at -150 Pa	0.02 L/s·m	
	Air Permeability Class		4	
	Final Air Permeability Class		4	

Notes: 1. The deflection of the glazing is recorded for reference only.

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Table 2 Test Results (Continued)

Test Description	Test Result		Verdict
Water Penetration Resistance Test - Static pressure AS/NZS 4420.1-2016 Section 6	No water penetration at	455 Pa	Pass
	Description: After water sprayed for 15 minutes at 455 Pa, no water penetration was observed.		
Ultimate Strength Test AS/NZS 4420.1-2016 Section 7	+	2130 Pa with no collapse	Pass
	-	2130 Pa with no collapse	
	Description: No significant breakage, permanent deformation or operational malfunction after ultimate strength was released.		
Torsional rigidity Test SNZ TS 4211:2022 Section 5.8	Maximum deflection	0.41 mm	Pass

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Appendix A: Test Data and Sample Drawings:

A.1 Deflection Test – Test method AS/NZS 4420.1-2016

Test Pressure (Serviceability design wind pressure), $P = 970 \text{ Pa}$,

Note: the maximum deflection due to bending of any structural member, including the outer window frame, measured relative to the end of the member at the serviceability limit state shall not exceed span/200 of the span.

Table 3 Test Data of Deflection Test

Member (mm)		Test Pressure (Pa)	Deflection (mm)			Actual Deflection	Deflection /Span Ratio
Item	Span Length		1	2	3		
Stile	1070	+P/4 = 243	<0.1	0.2	0.2	0.1	1:10700
		+2P/4 = 485	0.1	0.6	0.6	0.3	1:3567
		+3P/4 = 728	0.2	1.0	0.9	0.5	1:2140
		+4P/4 = 970	0.3	1.4	1.3	0.6	1:1783
		0	<0.1	0.2	0.2	0.1	1:10700
Stile	1070	-P/4 = -243	<0.1	0.3	0.2	0.2	1:5350
		-2P/4 = -485	0.1	0.7	0.7	0.3	1:3567
		-3P/4 = -728	0.3	1.4	1.3	0.6	1:1783
		-4P/4 = -970	0.4	2.1	2.1	0.9	1:1189
		0	0.1	0.2	0.2	0.1	1:10700

Table 4 Test Data of Deflection Test

Member (mm)		Test Pressure (Pa)	Deflection (mm)			Actual Deflection	Deflection /Span Ratio
Item	Span Length		3	4	5		
Rail at handle side	590	+P/4 = 243	0.2	0.3	0.4	0.1	1:5900
		+2P/4 = 485	0.6	0.7	0.8	0.1	1:5900
		+3P/4 = 728	0.9	1.1	1.1	0.1	1:5900
		+4P/4 = 970	1.3	1.5	1.3	0.2	1:2950
		0	0.2	0.2	0.1	0.1	1:5900
Rail at handle side	590	-P/4 = -243	0.2	0.2	0.3	0.1	1:5900
		-2P/4 = -485	0.7	0.6	0.6	0.1	1:5900
		-3P/4 = -728	1.3	1.2	1.0	0.2	1:2950
		-4P/4 = -970	2.1	1.8	1.6	0.3	1:1967
		0	0.2	0.2	0.2	<0.1	<1:5900

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Table 5 Test Data of Deflection Test

Member (mm)		Test Pressure (Pa)	Deflection (mm)			Actual Deflection	Deflection /Span Ratio
Item	Span Length		6	7	8		
Mullion	1070	+P/4 = 243	<0.1	0.2	<0.1	0.2	1:5350
		+2P/4 = 485	0.1	0.4	0.1	0.3	1:3567
		+3P/4 = 728	0.2	0.7	0.2	0.5	1:2140
		+4P/4 = 970	0.3	1.0	0.4	0.7	1:1529
		0	<0.1	0.1	0.1	0.1	1:10700
Mullion	1070	-P/4 = -243	<0.1	0.1	<0.1	0.1	1:10700
		-2P/4 = -485	0.1	0.4	0.2	0.3	1:3567
		-3P/4 = -728	0.2	0.8	0.5	0.5	1:2140
		-4P/4 = -970	0.4	1.4	1.2	0.6	1:1783
		0	0.1	0.1	0.2	0.1	1:10700

Table 6 Test Data of Deflection Test

Member (mm)		Test Pressure (Pa)	Deflection (mm)			Actual Deflection	Deflection /Span Ratio
Item	Span Length		9	10	11		
Glazing	760	+P/4 = 243	0.4	0.6	0.3	0.3	1:2533
		+2P/4 = 485	0.9	1.3	0.7	0.5	1:1520
		+3P/4 = 728	1.5	2.3	1.9	0.6	1:1267
		+4P/4 = 970	1.9	2.9	2.3	0.8	1:950
		0	0.1	0.1	0.1	<0.1	<1:7600
Glazing	760	-P/4 = -243	0.3	0.5	0.3	0.2	1:3800
		-2P/4 = -485	0.6	1.2	0.5	0.7	1:1086
		-3P/4 = -728	1.1	1.9	0.8	1.0	1:760
		-4P/4 = -970	1.8	2.7	1.7	1.0	1:760
		0	0.2	0.1	0.3	0.1	1:7600

A.2 Torsional Test – Test method SNZ TS 4211:2022 Section 5.8 Torsional rigidity Test

Table 7 Test Data of Torsional Strength

Torsional Test - From inside to outside				
Load	10 N	20 N	30 N	40 N
Deflection(mm)	0.15	0.23	0.30	0.41
Torsional Test - From outside to inside				
Load	10 N	20 N	30 N	40 N
Deflection(mm)	0.17	0.24	0.31	0.40

The maximum deflection of a glazed projecting sash shall not exceed 0.025 times the length of the shortest of two members joined at the point of load, or 30 mm (whichever is the lesser), when loaded with a force of 40 N.

The required deflection is 15.0 mm(= 0.025 x 600mm).

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Appendix A: Test Data and Sample Drawings:

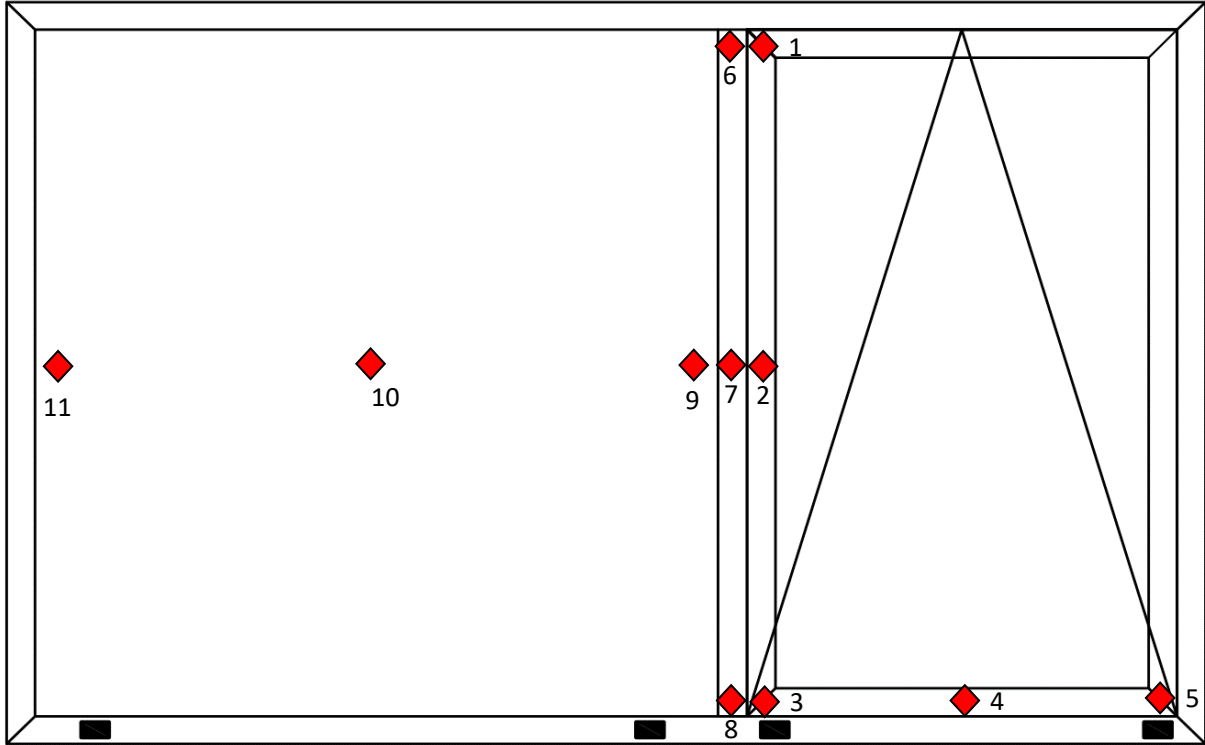


Fig.1 Locations of Displacement Measuring Devices

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Appendix A: Test Data and Sample Drawings:

A.2 Sample Drawings

Main Draw

Section Draw

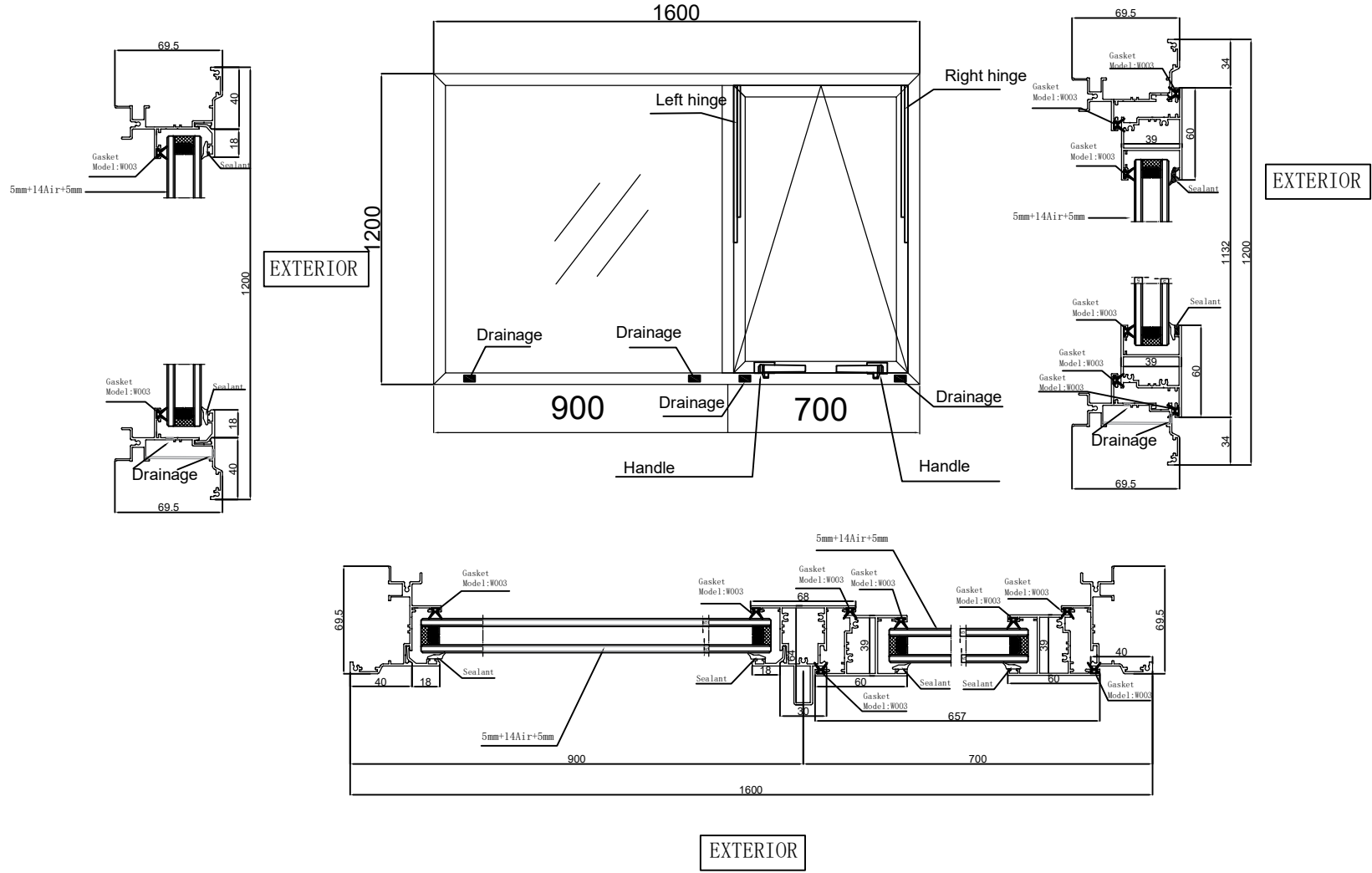
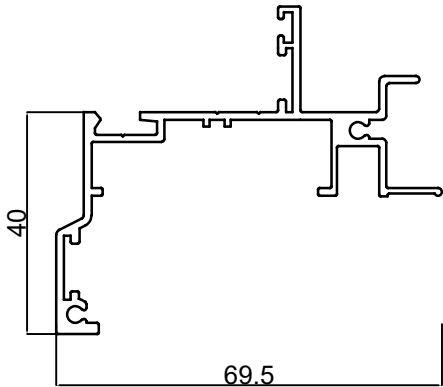


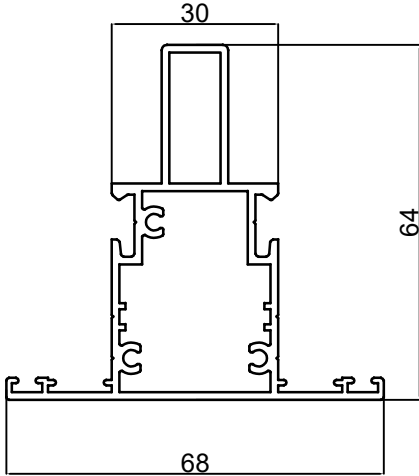
Fig.2 Drawing of Representative Sample

TLM172-13



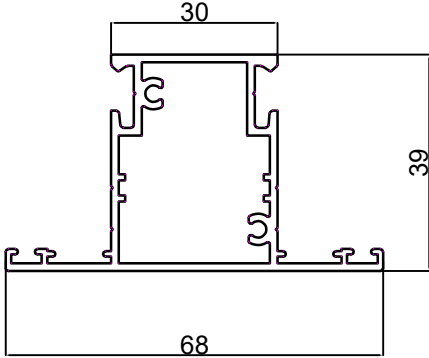
Window frame

TLM172-15



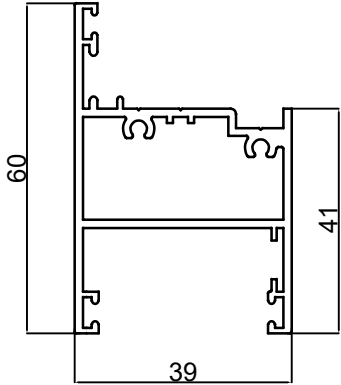
Window skewer

TLM172-14



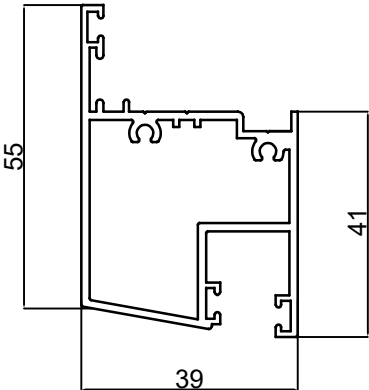
mullion

TLM172-16



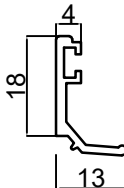
Sash

TLM172-17



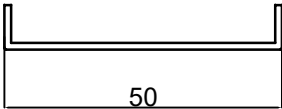
single glaze sash

TLM172-19



Pressure line

TLM172-18



Drain box

Fig.3 Drawing of Representative Sample

Hardware Drawings

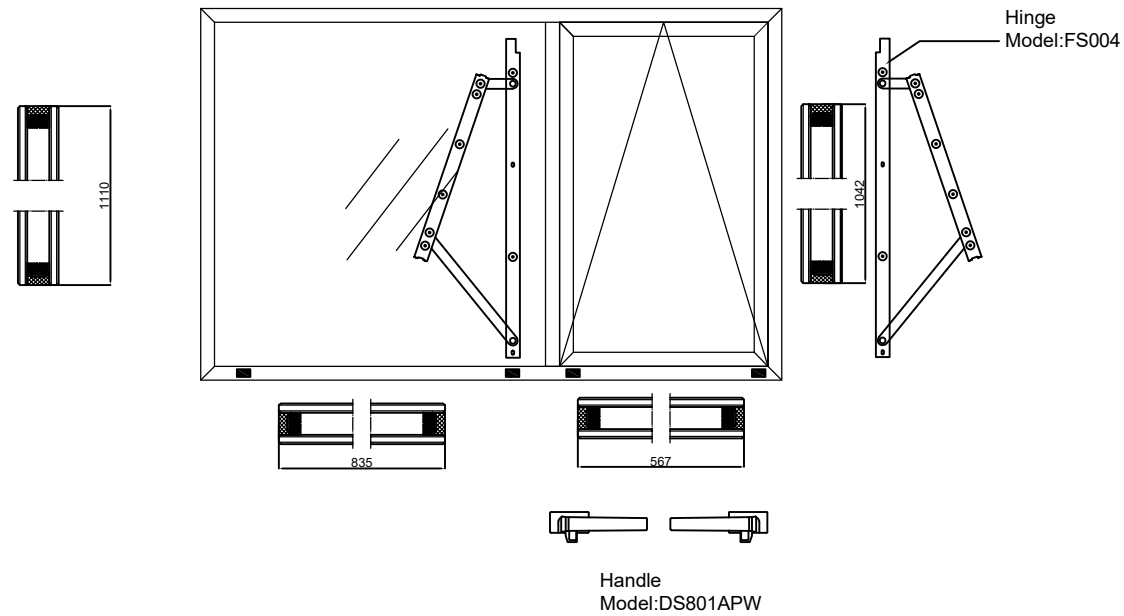


Fig.4 Drawing of Representative Sample

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Appendix B: Sample Received Photo



Revision:

NO.	Date	Changes
230612020SHF-001	2023-07-04	First issue