FUZHOU ROPO BUILDING MATERIALS CO., LTD.

TEST REPORT

SCOPE OF WORK
Aluminum Tilt & Turn Window

REPORT NUMBER
210930003SHF-002

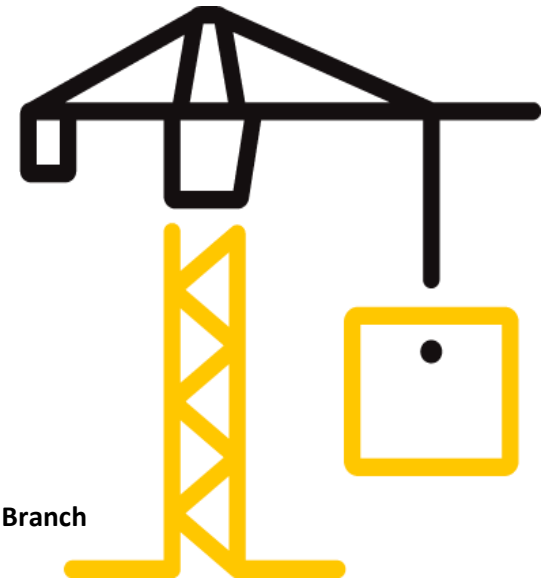
TEST DATE(S)
2021-12-06

ISSUE DATE
2021-12-24

PAGES
12

DOCUMENT CONTROL NUMBER
LFT-APAC-SHF-OP-10k(May 1, 2021)

Intertek Testing Services Shenzhen Ltd. Shanghai Fengxian Branch



Test Report

Statement

1.This report is invalid without company's special seal for testing on assigned page.

2.This report is invalid without authorized person's signature.

3.This report is invalid where any unauthorized modification indicated.

4.Don't copy this report in partial (except full copy) without any official approval in written by our company. This report is invalid without re-stamping the special seal for testing in copying report.

5.Any holder of this document is advised that this report is for the exclusive use of Intertek's Customer and is provided pursuant to the agreement between Intertek and its Customer. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. This report was made with due care within the limitation of a defined scope of work and on the basis of information, materials and instructions received from the Customer or its nominated third parties. Intertek is under no obligation to refer to or report upon any facts or circumstances which are outside the specific instructions received and accepts no responsibility to any parties whatsoever, following the issue of the report, for any matters arising outside the agreed scope of the works. The tests results are not intended to be a recommendation for any particular course of action. Customer is responsible for acting as it sees fit on the basis of such results.

6.Intertek's written consent is required to use Intertek's name or logo on the object, product or service being tested. The observations and test results in this report relate only to the sample under test. This report alone does not indicate that the item, product or service has passed any Intertek certification program.

7.The report was digital signed by Shang Hai, Intertek Group plc, please using Adobe Acrobat Reader to verify the authenticity.

Intertek Testing Services Shenzhen Ltd. Shanghai Fengxian Branch
Plant 5, No. 6958 Daye Road, Fengxian District, Shanghai, China
Tel: +86 21-61136116 Fax: 021-61189921
Website: www.intertek.com

Test Report

Issue Date: 2021-12-24 Intertek Report No. 210930003SHF-002
Applicant: Fuzhou Ropo Building Materials Co., Ltd.
Address: Tieling Industrial Zone, Minhou, Fuzhou, Fujian, China
Attn: Mr Deng
Manufacturer: Fuzhou Ropo Building Materials Co., Ltd.
Address: Tieling Industrial Zone, Minhou, Fuzhou, Fujian, China
Test Type: Performance test, samples provided by the applicant.

Product Information

Product Name	Aluminum Tilt & Turn Window	**Brand**	ROPO
Sample Description	Good Condition	**Sample Amount**	1 set
		Received Date	2021-10-22

Sample ID	**Model**	**Specification**
S210930003SHF.001	ROPO70TT	1600mm(Width) × 1800mm(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
Specification Standard	AS 2047-2014 Windows and external glazed doors in buildings (Amdt 2-2017)
Test Conclusion	The results conform to the applicable requirements of AS 2047-2014 (Amdt 2-2017), 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
Title: Approver

Name: Zac Zhang
Title: Reviewer

Name: Gio Liu
Title: Project Engineer

Test Report

Issue Date: 2021-12-24 Intertek Report No. 210930003SHF-002

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 Tilt & Turn Window
2	Model	ROPO70 TT
3	Dimension of Window Frame	1600mm(Width) × 1800mm(Height) × 70mm(Thickness)
4	Dimension of Window Sash	Operable: 750mm(Width) × 1730mm(Height) × 69mm(Thickness) Fixed Part: 800mm(Width) × 1800mm(Height) × 70mm(Thickness)
5	Aluminum Profile	Model: ROPO70 TT Supplier: Guangdong Jianmei Aluminium Profiles Factory (Group) Co., Ltd.
6	Frame Corner Construction Details: Joinery Type	Mitre-Cut, Assembly with Corner Bracket
7	Reinforcement	None
8	Glazing	Dimension: Operable Sash: 614mm(Width) × 1594mm(Height) Fixed Sash: 732mm(Width) × 1712mm(Height) Structure: 26mm Thickness; 5mm +16mm Ar +5mm Toughened Insulated Glass Supplier: Jiangsu Jiacheng Special Manufacturing Glass Co., Ltd
9	Hardware	Model: T600 Series Supplier: Roto Frank AG
10	Weather Bar	Not Applicable
11	Thermal Break	Model: C-20mm; I-20mm Supplier: Guangdong Jianmei Aluminium Profiles Factory (Group) Co., Ltd.
12	Drainage	Dimension: 5mm × 30mm Quantity: 2
13	Gasket (between leaf and frame)	Code: 112.254 Material: EPDM Supplier: Shenyang Ruide Plastics & Rubber Manufacturer Co., Ltd.
14	Sealant of Glass	Model: DOWSIL SJ168 Material: Silicone Weatherproofing Sealant Supplier: Dow China
15	Installation	The rough opening allowed for a 6 mm shim space. The exterior perimeter of the test specimen was sealed with silicon sealant.

intertek
Total Quality. Assured.

Test Report

Issue Date: 2021-12-24 Intertek Report No. 210930003SHF-002

Test Items, Method and Results：

2 Test Result

Table 2 Test Results

Test Description	Test Result		
Serviceability Design Wind Pressure AS/NZS 4420.1-2016 section 3		± 1600 Pa	
Deflection / Span Ratio Framing member 1	Stile at handle side	1/853	
Deflection / Span Ratio Framing member 2	Bottom Rail	1/2000	
Deflection / Span Ratio Framing member 3	Mullion	1/635	
Operating Force for Sash - Turn AS/NZS 4420.1-2016 Section 4	Initial Movement	Required	≤ 160 N
		Open	29 N
		Close	28 N
	Maintain Movement	Required	≤ 80 N
		Open	18 N
		Close	18 N
Operating Force for Sash - Tilt AS/NZS 4420.1-2016 Section 4	Initial Movement	Required	≤ 160 N
		Open	31 N
		Close	31 N
	Maintain Movement	Required	≤ 80 N
		Open	19 N
		Close	18 N
Air Infiltration at ±75 Pa AS/NZS 4420.1-2016 section 5		at +75Pa	0.07 $L/s \cdot m^2$
Overall area: 2.88 m^2		at -75Pa	0.10 $L/s \cdot m^2$
Water Penetration AS/NZS 4420.1-2016 section 6	No water penetration at		600 Pa
	Description: After water sprayed for 15 minutes at 600 Pa, there was no water penetration.		
Ultimate Strength Test Pressure AS/NZS 4420.1-2016 section 7		± 4000	Pa with no collapse
	Description: No significant breakage, permanent deformation or operational malfunction after ultimate strength was released.		

Test Report

Issue Date: 2021-12-24 Intertek Report No. 210930003SHF-002

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 = 1600 Pa,

Note: No structural members in a completely assembled and glazed window shall deflect by an amount greater than the following, when tested at the serviceability design wind pressure:
(a) Span/250 for windows and sliding doors.
(b) Span/100 for doors other than sliding.

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 at handle side	1620	+P/4 = 400	0.4	0.8	0.2	0.5	1/3240
		+2P/4 = 800	0.7	1.5	0.3	1.0	1/1620
		+3P/4 = 1200	1.1	2.3	0.5	1.5	1/1080
		+4P/4 = 1600	1.6	3.1	0.8	1.9	1/853
		0	0.1	0.1	0.1	<0.1	<1/16200
Stile at handle side	1620	-P/4 = -400	0.4	0.7	0.2	0.4	1/4050
		-2P/4 = -800	0.8	1.5	0.4	0.9	1/1800
		-3P/4 = -1200	1.4	2.7	0.7	1.7	1/953
		-4P/4 = -1600	1.7	3.1	1.0	1.8	1/900
		0	0.1	0.1	0.1	<0.1	<1/16200

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		
Bottom Rail	600	+P/4 = 400	0.2	0.1	0.1	0.1	1/6000
		+2P/4 = 800	0.3	0.3	0.1	0.1	1/6000
		+3P/4 = 1200	0.5	0.4	0.2	0.2	1/3000
		+4P/4 = 1600	0.8	0.6	0.4	0.2	1/3000
		0	0.1	0.1	0.1	<0.1	<1/6000
Bottom Rail	600	-P/4 = -400	0.2	0.1	0.1	0.1	1/6000
		-2P/4 = -800	0.4	0.3	0.2	0.1	1/6000
		-3P/4 = -1200	0.7	0.5	0.3	0.2	1/3000
		-4P/4 = -1600	1.0	0.7	0.4	0.3	1/2000
		0	0.1	0.1	0.1	<0.1	<1/6000

Test Report

Issue Date: 2021-12-24 Intertek Report No. 210930003SHF-002

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	1650	+P/4 = 400	0.3	0.7	0.1	0.5	1/3300
		+2P/4 = 800	0.6	1.5	0.1	1.2	1/1375
		+3P/4 = 1200	0.9	2.4	0.3	1.8	1/917
		+4P/4 = 1600	1.3	3.3	0.5	2.4	1/688
		0	<0.1	0.1	<0.1	0.1	1/16500
Mullion	1650	-P/4 = -400	0.2	0.8	0.1	0.7	1/2357
		-2P/4 = -800	0.7	1.8	0.2	1.4	1/1179
		-3P/4 = -1200	1.1	2.8	0.3	2.1	1/786
		-4P/4 = -1600	1.4	3.5	0.5	2.6	1/635
		0	0.1	0.2	<0.1	0.2	1/8250

Appendix A: Test Data and Sample Drawings:

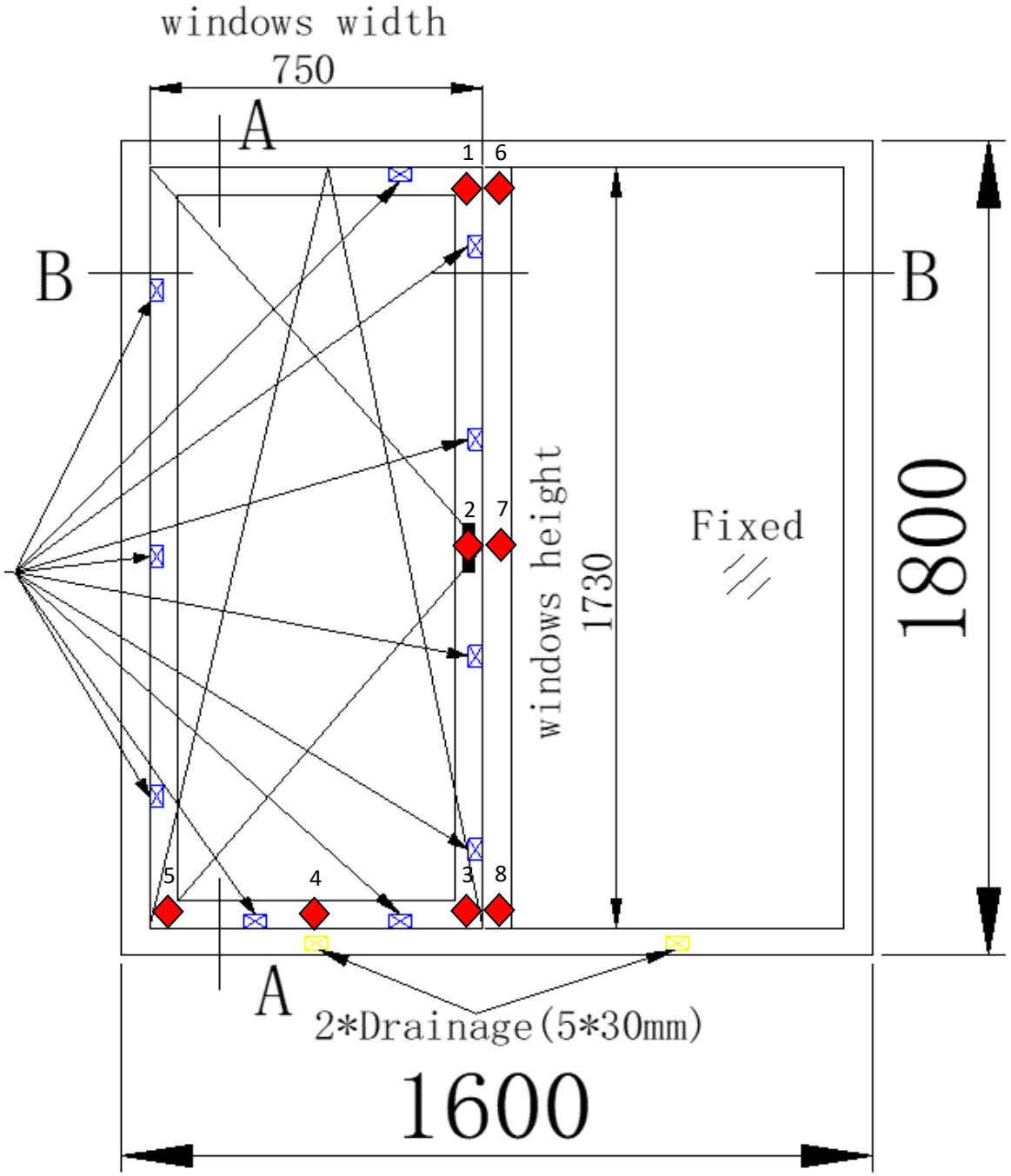


Fig.1 Locations of Displacement Measuring Devices

Appendix A: Test Data and Sample Drawings:

A.2 Sample Drawings

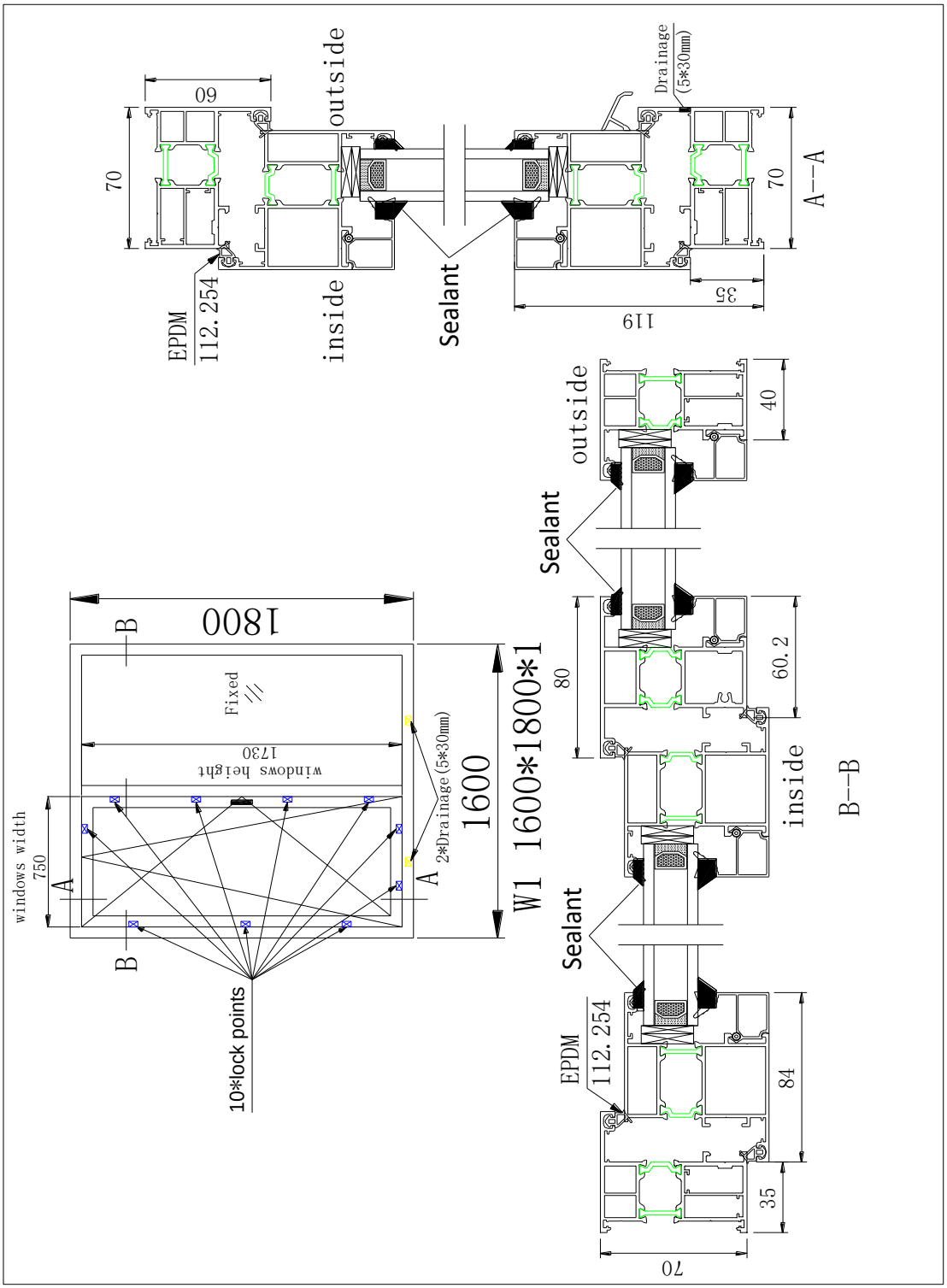


Fig.2 Drawing of Representative Sample

Test Report

Issue Date: 2021-12-24 Intertek Report No. 210930003SHF-002

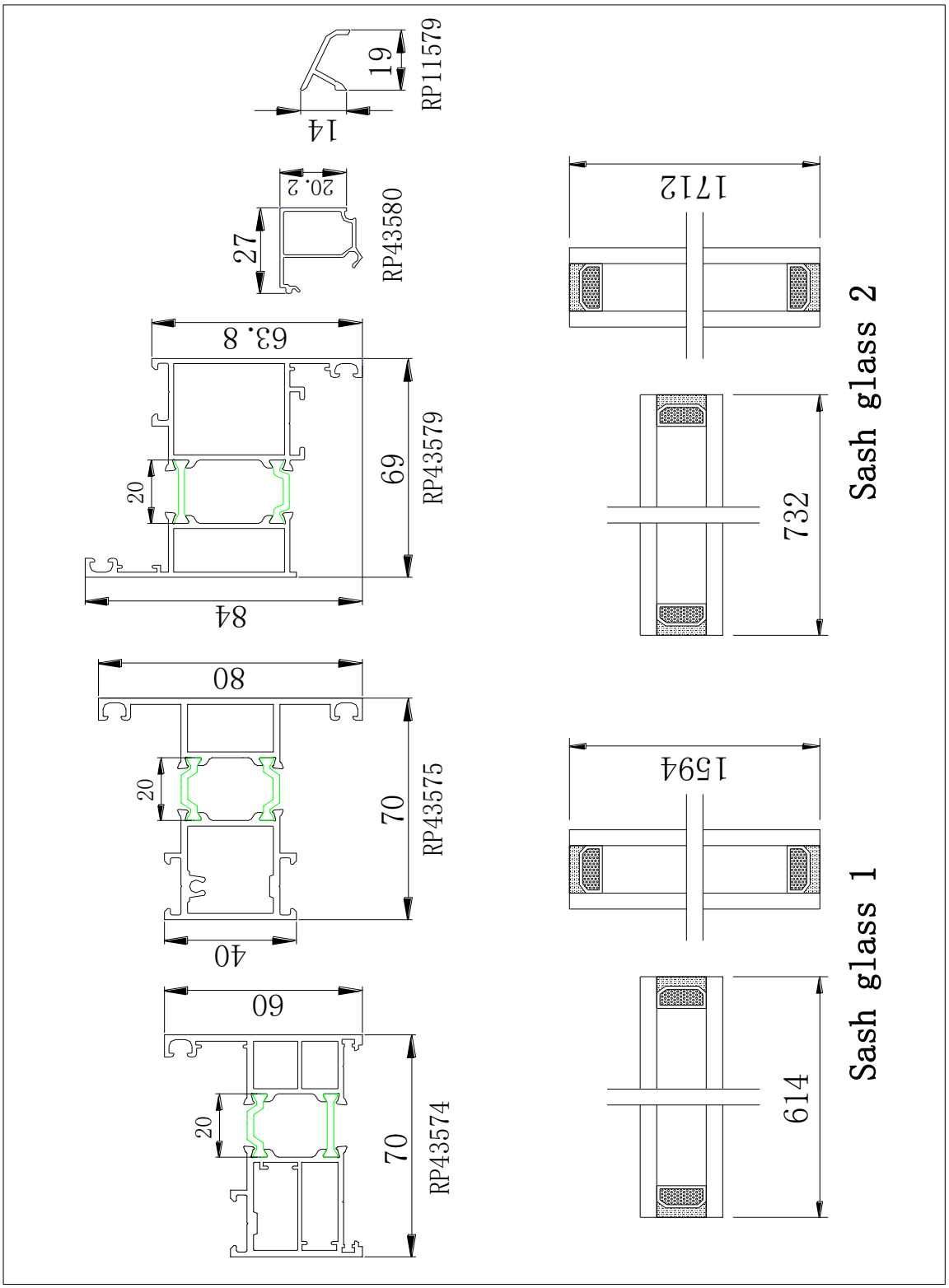


Fig.3 Drawing of Representative Sample

Test Report

Issue Date: 2021-12-24 Intertek Report No. 210930003SHF-002

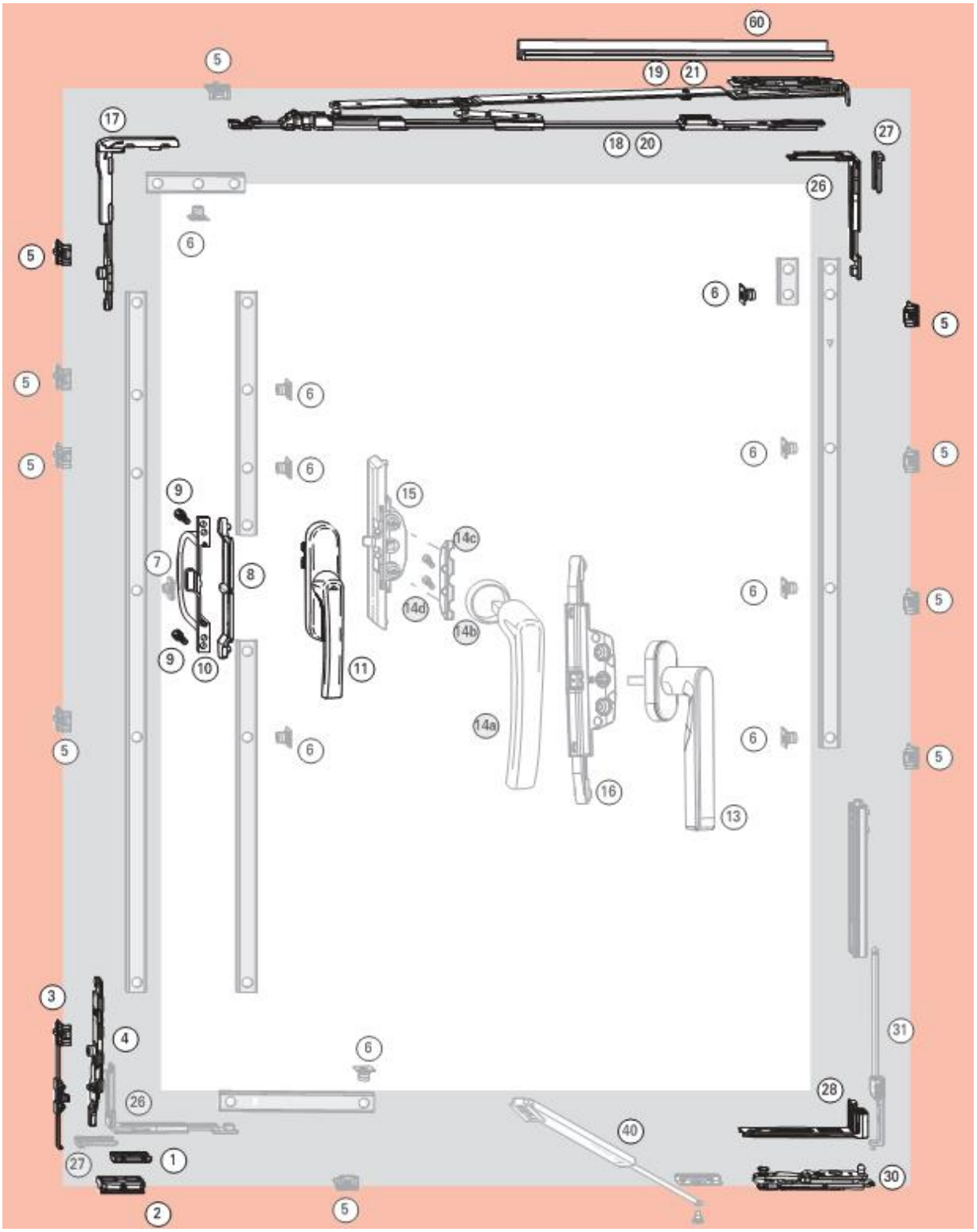


Fig.4 Drawing of Representative Sample

Test Report

Issue Date: 2021-12-24 Intertek Report No. 210930003SHF-002

Appendix B: Sample Received Photo

Revision:

NO.	Date	Changes
210930003SHF-002	2021-12-24	First issue