

ALIPLAST SP. Z O.O. FLORIDA BUILDING CODE TEST REPORT

SCOPE OF WORK

TAS 202, ASTM E1886, AND ASTM E1996 TESTING ON
IMPERIAL/IP, DUAL ACTION WINDOW

REPORT NUMBER

P2068.01-109-18

TEST DATE(S)

12/1/22 – 03/17/23

ISSUE DATE

04/18/23

RECORD RETENTION END DATE

03/17/2033

PAGES

22

DOCUMENT CONTROL NUMBER

RT-R-AMER-Test-2816 (07/12/22)

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TEST REPORT FOR ALIPLAST SP. Z O.O.

Report No.: P2068.01-109-18

Date: 04/18/23

REPORT ISSUED TO

ALIPLAST SP. Z O.O.

Waclawa Moritza 3

Lublin, 20-276

POLAND

SECTION 1

SCOPE

Architectural Testing, Inc. (an Intertek company) dba Intertek Building & Construction (B&C) was contracted by Aliplast Sp. z o. o. to perform TAS 202, ASTM E1886, and ASTM E1996 testing in accordance with Florida Building Code requirements on their Imperial/IP, Dual Action Window. Results obtained are tested values and were secured by using the designated test method(s). Testing was conducted at the Intertek B&C test facility in York, Pennsylvania.

SECTION 2

SUMMARY OF TEST RESULTS

The specimen(s) tested met the performance requirements set forth in the protocols.

SPEC.	TEST PROTOCOL	DESIGN PRESSURE
1	TAS 202	+75.00 / -75.00 psf
2, 3, 4	ASTM E1886 and ASTM E1996 (Large Missile)	+75.00 / -75.00 psf

For INTERTEK B&C:

COMPLETED BY: Richard E. Hartman III
TITLE: Team Lead - Product Testing
SIGNATURE:
DATE: 04/18/23

REH:bsm

REVIEWED BY: Tanya A. Dolby, P.E.
TITLE: Engineering Manager - Engineering Services
SIGNATURE:
DATE: 04/18/23

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SECTION 3

TEST METHOD(S)

The specimens were evaluated in accordance with the following:

TAS 202-94, *Criteria for Testing Impact & Non Impact Resistant Building Envelope Components Using Uniform Static Air Pressure*

ASTM E1886-19, *Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials*

ASTM E1996-20, *Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes*

ASTM F588-17, *Standard Test Methods for Measuring the Forced Entry Resistance of Window Assemblies, Excluding Glazing Impact*

SECTION 4

MATERIAL SOURCE/INSTALLATION

Test specimen(s) were provided by the client. Representative samples of the test specimen(s) will be retained by Intertek B&C for a minimum of ten years from the test completion date.

The specimen was installed into a 4" x 4" steel tube test buck. The rough opening allowed for a 1/4" shim space. The interior and exterior perimeter of the specimen was sealed with sealant. Installation of the tested product was performed by the client.

LOCATION	ANCHOR DESCRIPTION	ANCHOR LOCATION
Head and sill	#12 x 5" self-drilling hex head screw with sealing washer, two fasteners per anchor location	Located 7" from each corner and spaced 16" on center through the test buck and into the member
Jambs		Located 5" from each corner and spaced 16" on center through the test buck and into the member

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SECTION 5 EQUIPMENT

Cannon: Constructed from steel piping utilizing compressed air to propel the missile, A1207

Missile: 2x4 Southern Pine

Timing Device: Electronic beam type

Cycling Mechanism: Computer controlled centrifugal blower with electronic pressure measuring device, 003921, 005644

Deflection Measuring Device: Linear transducers, 64280, 64306, 64278

Tape Measure Verification: 63788

Weather Station: 63316, 003926

Spray Rack: 003956

Spring Scale: INT00009, 63395

SECTION 6 LIST OF OFFICIAL OBSERVERS

NAME	COMPANY
Mariusz Ciolek	Aliplast Sp. z o. o.
Pawel Czarnecki	Aliplast Sp. z o. o.
Mateusz Czarnecki	Aliplast Sp. z o. o.
Tanya A. Dolby, P. E.	Intertek B&C
Richard E. Hartman III	Intertek B&C

SECTION 7 TEST SPECIMEN DESCRIPTION

Product Type: Dual Action Window

Series/Model: Imperial/IP

Product Size(s):

OVERALL AREA:	WIDTH		HEIGHT	
	millimeters	inches	millimeters	inches
2.7 m ² (29.1 ft ²)				
Overall size	1232	48-1/2	2197	86-1/2
Vent size	1156	45-1/2	2127	83-3/4

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The following descriptions apply to all specimens.

Frame Construction:

FRAME MEMBER	MATERIAL	DESCRIPTION
Head, sill, and jambs	Aluminum	Extruded, thermally broken, dual strutted
JOINERY TYPE		DETAIL
All corners	Mitered	Sealed and secured using a mechanical corner key at the interior and exterior hollows

Sash Construction:

SASH MEMBER	PART #	MATERIAL	DESCRIPTION
Rails and stiles	IP821 S	Aluminum	Extruded, thermally broken, dual strutted
JOINERY TYPE		DETAIL	
All corners	Mitered	Sealed and secured using a mechanical corner key at the interior and exterior hollows	

Reinforcement: *No reinforcement was utilized.*

Weatherstripping:

DESCRIPTION	QUANTITY	LOCATION
Custom-shaped central gasket	1 Row	Frame perimeter
Kerf-mounted 0.235" high fin seal	1 Row	Vent perimeter

Glazing: *No conclusions of any kind regarding the adequacy or inadequacy of the glass in any glazed test specimen(s) can be made.*

Test Specimen #1: TAS 202

GLASS TYPE	SPACER TYPE	INTERIOR LITE	EXTERIOR LITE	GLAZING METHOD
1-1/4" IG	Desiccant-filled aluminum box spacer	1/4" tempered	1/4" tempered 0.060" PVB interlayer 1/4" tempered	Interior glazed against a glazing gasket on the vent frame. A bead of sealant was placed in the glazing track. The glazing was secured using an extruded aluminum glazing bead with a glazing gasket.

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Test Specimen #2, 3, and 4: ASTM E1886 and ASTM E1996

GLASS TYPE	SPACER TYPE	INTERIOR LITE	EXTERIOR LITE	GLAZING METHOD
1-1/4" IG	Desiccant-filled aluminum box spacer	1/4" tempered 0.060" SGB interlayer 1/4" tempered	1/4" tempered	Interior glazed against a glazing gasket on the vent frame. A bead of sealant was placed in the glazing track. The glazing was secured using an extruded aluminum glazing bead with a glazing gasket.

LOCATION	QUANTITY	DAYLIGHT OPENING		GLASS BITE
		millimeters	inches	
Vent daylight opening	1	978 x 1956	38-1/2 x 77	5/8"

Drainage:

DRAINAGE METHOD	SIZE	QUANTITY	LOCATION
Weepslot	3/16" wide by 1-3/16" high	2	Bottom rail glazing channel, 10-1/4" from each end, draining to the bottom rail hollow
Weepslot	3/16" wide by 1-3/16" high	2	Bottom rail, 10-1/4" from each end, draining to the sill
Weepslot with cover	1-1/4" wide by 5/32" high	2	Sill face, 6-1/2" from each end, draining to the exterior

Hardware:

DESCRIPTION	QUANTITY	LOCATION
Dual action latch and multipoint lock assembly	1 set	Handle located on the latch stile 42" from the bottom rail
Dual action hinges	2	Hinge stile corners
Receivers	17	Sill, 16-1/2" and 29-3/4" from the latch jamb Head, 1", 16-5/8", and 28-1/2" from the latch jamb Latch jamb, 3", 22", 32", 43", 63-1/4", and 71-1/2" from the sill Hinge jamb, 15-1/2", 24-1/2", 35", 54-1/4", 63-1/4", and 73-1/4" from the sill

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SECTION 8

TEST RESULTS

Protocol TAS 202-94, Static Air Pressure

Test Date(s): 12/1/22 through 12/2/22

The temperature during testing was 17°C (63°F). The results are tabulated as follows:

TITLE OF TEST	RESULTS	NOTE
Air Leakage, Infiltration per TAS 202 at 6.27 psf (50 mph)	0.3 L/s/m ² (0.06 cfm/ft ²)	1
Air Leakage, Exfiltration per TAS 202 at 6.27 psf (50 mph)	0.1 L/s/m ² (0.02 cfm/ft ²)	1

Note 1: Test Date 12/01/22 / Time: 12:00 PM

Test Specimen #1: Preload and Design Load per TAS 202

LOAD (psf)	INDICATOR LOCATION	DEFLECTION (in.)		PERMANENT SET (in.)	
		MEASURED	ALLOWED	MEASURED	ALLOWED
+56.25 50% of Test Pressure	1	0.15	N/A	0.03	N/A
	2	0.11	N/A	0.02	N/A
	3	0.07	N/A	0.03	N/A
+75.00 Design Pressure	1	0.22	N/A	0.04	N/A
	2	0.17	N/A	0.05	N/A
	3	0.13	N/A	0.06	N/A
-56.25 50% of Test Pressure	1	0.16	N/A	0.01	N/A
	2	0.13	N/A	0.01	N/A
	3	0.11	N/A	0.01	N/A
-75.00 Design Pressure	1	0.16	N/A	0.01	N/A
	2	0.12	N/A	0.01	N/A
	3	0.05	N/A	0.01	N/A

Test Specimen #1: Water Penetration per TAS 202

TITLE OF TEST	RESULTS	ALLOWED	NOTE
Water Penetration, per TAS 202 20% of Positive Design Pressure at 720 Pa (15.04 psf)	Pass	No leakage	2

Note 2: Without insect screen

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Test Specimen #1: Structural Overload per TAS 202

LOAD (psf)	INDICATOR LOCATION	DEFLECTION (in.)		PERMANENT SET (in.)	
		MEASURED	ALLOWED	MEASURED	ALLOWED
+112.50 Test Pressure	1	0.30	N/A	0.03	N/A
	2	0.24	N/A	0.03	N/A
	3	0.16	N/A	0.04	N/A
-112.50 Test Pressure	1	0.29	N/A	0.02	N/A
	2	0.24	N/A	0.02	N/A
	3	0.16	N/A	0.01	N/A

Note 3: Positive and negative uniform static load test loads were held for 30 seconds.

Note 4: Tape and film were not used to seal against air leakage during structural testing.

Note 5: See Sketch #1 for indicator locations.

Test Specimen #1: Forced Entry Resistance per TAS 202

TITLE OF TEST	RESULTS	ALLOWED	NOTE
Forced Entry Resistance, per ASTM F588	Pass	No entry	

Protocol ASTM E1996, Large Missile Impact Procedures

Test Date: 03/14/23

The temperature during testing was 17°C (63°F). The results are tabulated as follows:

Conditioning Temperature: 17°C (63°F)

Missile Weight: 4169 g (9.19 lbs)

Missile Length: 2.5 m (8' 4")

Muzzle Distance from Test Specimen: 5.2 m (17')

Test Specimen #2: Orientation within ±5° of horizontal

IMPACT	#1
MISSILE VELOCITY	15.2 m/s (49.9 fps)
IMPACT AREA	Center of glazing
OBSERVATIONS	Missile hit target area, shattered exterior lite, fractured interior lite
RESULTS	Pass

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Test Specimen #3: Orientation within $\pm 5^\circ$ of horizontal

IMPACT	#1
MISSILE VELOCITY	15.3 m/s (50.2 fps)
IMPACT AREA	Top right corner of glazing
OBSERVATIONS	Missile hit target area, shattered exterior lite, fractured interior lite
RESULTS	Pass

Test Specimen #4: Orientation within $\pm 5^\circ$ of horizontal

IMPACT	#1
MISSILE VELOCITY	15.1 m/s (49.7 fps)
IMPACT AREA	Bottom left corner of glazing
OBSERVATIONS	Missile hit target area, shattered exterior lite, fractured interior lite
RESULTS	Pass

Note 6: See Sketch #2 for impact locations.

Test Date(s): 03/15/23 through 03/17/23

The temperature during testing was 17°C (63°F). The results are tabulated as follows:

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Test Specimen #2:**Design Pressure:** ± 3591 Pa (± 75.0 psf)**Positive Pressure:**

PRESSURE RANGE Pa (psf)	NUMBER OF CYCLES	AVERAGE CYCLE TIME (seconds)	OBSERVATIONS
718 to 1796 (15.0 to 37.5)	3500	2.25	No additional damage
0 to 2155 (0 to 45.0)	300	2.79	No additional damage
1796 to 2873 (37.5 to 60.0)	600	2.84	No additional damage
1077 to 3591 (22.5 to 75.0)	100	2.50	No additional damage

Negative Pressure:

PRESSURE RANGE Pa (psf)	NUMBER OF CYCLES	AVERAGE CYCLE TIME (seconds)	OBSERVATIONS
1077 to 3591 (22.5 to 75.0)	50	2.78	No additional damage
1796 to 2873 (37.5 to 60.0)	1050	2.18	No additional damage
0 to 2155 (0 to 45.0)	50	2.71	No additional damage
718 to 1796 (15.0 to 37.5)	3350	2.31	No additional damage

Result: Pass

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Test Specimen #3:

Design Pressure: ±3591 Pa (±75.0 psf)

Positive Pressure:

PRESSURE RANGE Pa (psf)	NUMBER OF CYCLES	AVERAGE CYCLE TIME (seconds)	OBSERVATIONS
718 to 1796 (15.0 to 37.5)	3500	2.25	No additional damage
0 to 2155 (0 to 45.0)	300	2.79	No additional damage
1796 to 2873 (37.5 to 60.0)	600	2.77	No additional damage
1077 to 3591 (22.5 to 75.0)	100	2.79	No additional damage

Negative Pressure:

PRESSURE RANGE Pa (psf)	NUMBER OF CYCLES	AVERAGE CYCLE TIME (seconds)	OBSERVATIONS
1077 to 3591 (22.5 to 75.0)	50	2.86	No additional damage
1796 to 2873 (37.5 to 60.0)	1050	2.24	No additional damage
0 to 2155 (0 to 45.0)	50	2.86	No additional damage
718 to 1796 (15.0 to 37.5)	3350	2.10	No additional damage

Result: Pass

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Test Specimen #4:

Design Pressure: ±3591 Pa (±75.0 psf)

Positive Pressure:

PRESSURE RANGE Pa (psf)	NUMBER OF CYCLES	AVERAGE CYCLE TIME (seconds)	OBSERVATIONS
718 to 1796 (15.0 to 37.5)	3500	2.30	No additional damage
0 to 2155 (0 to 45.0)	300	2.65	No additional damage
1796 to 2873 (37.5 to 60.0)	600	2.63	No additional damage
1077 to 3591 (22.5 to 75.0)	100	2.75	No additional damage

Negative Pressure:

PRESSURE RANGE Pa (psf)	NUMBER OF CYCLES	AVERAGE CYCLE TIME (seconds)	OBSERVATIONS
1077 to 3591 (22.5 to 75.0)	50	2.98	No additional damage
1796 to 2873 (37.5 to 60.0)	1050	2.30	No additional damage
0 to 2155 (0 to 45.0)	50	2.86	No additional damage
718 to 1796 (15.0 to 37.5)	3350	2.31	No additional damage

Result: Pass

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SECTION 9

CONCLUSIONS

No signs of failure were observed in any area of the test specimen during the TAS 202 testing; as such, the test specimen satisfies the requirements of TAS 202. Upon completion of testing, specimens tested for TAS 202-94 met the requirements of Section 1620 of the Florida Building Code, Building.

The specimen(s) tested met the performance requirements set forth in the referenced test procedures for a ± 3591 Pa (± 75.0 psf) Design Pressure with missile impacts corresponding to Missile Level D and Wind Zone 3. The specimens met the requirements of Section 7 of ASTM E1996.

This report does not constitute certification of this product nor an opinion or endorsement by this laboratory. Intertek B&C will service this report for the entire test record retention period. The test record retention period ends ten years after the test date. Test records, such as detailed drawings, datasheets, representative samples of test specimens, or other pertinent project documentation, will be retained for the entire test record retention period.

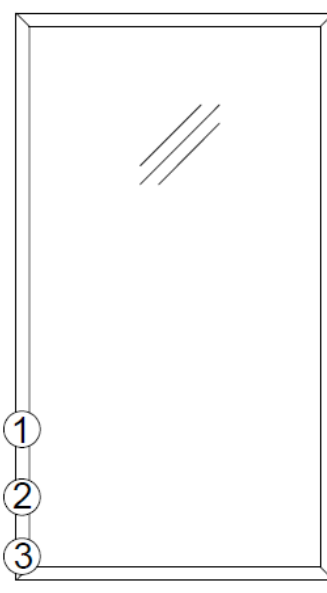

Unless differently required, Intertek reports apply the "Simple Acceptance" rule, also called "Shared Risk approach," of ILAC-G8:09/2019, Guidelines on Decision Rules and Statements of Conformity.

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SECTION 10 SKETCH(ES)

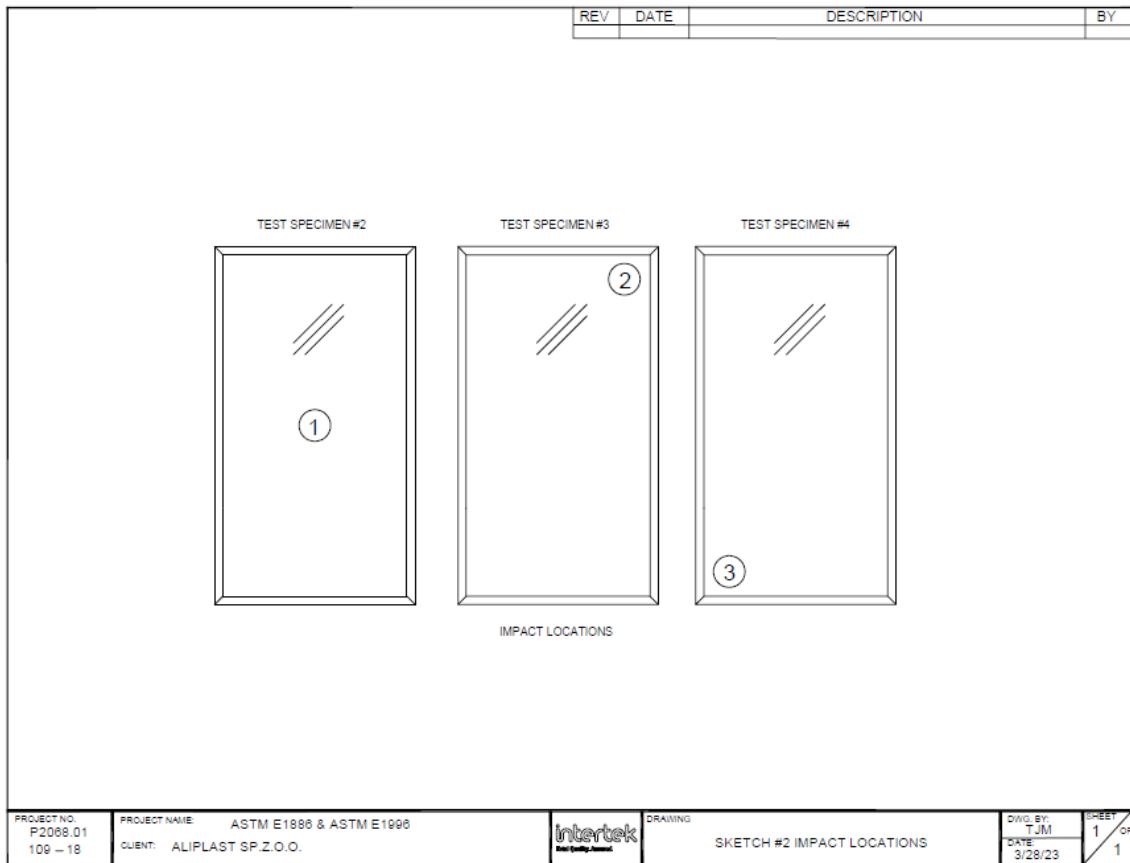
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<p>TEST SPECIMEN #1</p>  <p style="text-align: center;">INDICATOR LOCATION BETWEEN HARDWARE</p>			
PROJECT NO. P2068.01 109 - 18	PROJECT NAME TAS 202 CLIENT: ALIPLAST SP.Z.O.O.		DRAWING T.J.M. DATE 3/29/23
SKETCH #1 INDICATOR LOCATIONS		DWG. BY: TJM	SHEET 1 OF 1

Sketch No. 1
TAS 202 Indicator Locations

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Sketch No. 2
TAS 201 Impact Locations

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SECTION 11 PHOTOGRAPH



Photo No. 1
View of TAS 202 Test Specimen



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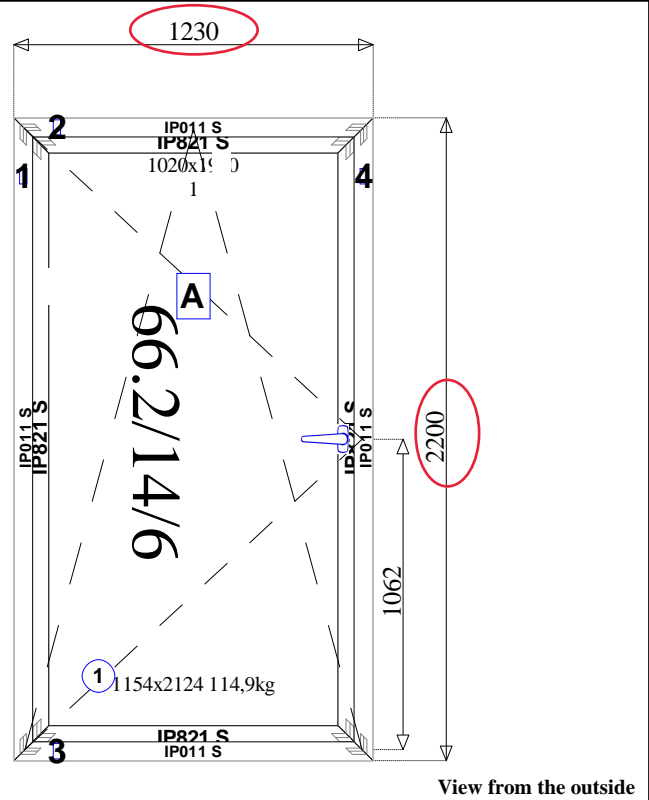
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SECTION 12 DRAWINGS

The test specimen drawings have been reviewed by Intertek B&C and are representative of the test specimen(s) reported herein. Test specimen construction was verified by Intertek B&C per the drawings included in this report. Any deviations are documented herein or on the drawings.

Pos. 2 IMPERIAL - Windows and window cases (B=1 230, H=2 200) Profiles code: Standard color Furniture colour: Standard color Fillings: 66.2/14/6
Quantity: 1 Surface: 2,71 m ² Circuit: 6,86 m Weight without: 30,76 kg Weight of glass: 97,25 kg Total weight: 128,01 kg Labor: 0,00 hours U Factor: 1,6 W/(m ² *m*K)
System: IMPERIAL Colour of: Standard color
Notes:



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Verified by:	<i>Richard E. H. Smith</i>

Profiles

Code	Quantity	Dimensions	Location	Description
IP011 S	2 pcs	2200 mm. (45';45')	1+4	Window frame 65 mm
	2 pcs	1230 mm. (45';45')	2..3	
IP821 S	2 pcs	1154 mm. (45';45')	A	Window sash 82mm
	2 pcs	2124 mm. (45';45')	A	

Additional profiles

Code	Quantity	Dimensions	Location	Description
IP568 S	2 pcs	1034 mm.	A	Glazing bead (equivalent for GL530)
	2 pcs	1960 mm.	A	
VL59/AN	1 pcs	613 mm.	A.gora	Linkbar silver anod
	1 pcs	896 mm.	A.odklamki	
	1 pcs	930 mm.	A.odklamki	
	1 pcs	1558 mm.	... many ...	

Gaskets

Code	Quantity	Dimensions	Location	Description
ACIP030	6,52 m		1..4	Central gasket imperial
ACUN033PL	6,04 m		A	Inner glazing gasket, range 3-5mm
ACVG31N	6,04 m		A	Glazing gasket outside 3mm
ACVL031	6,56 m		A	Gasket for inside opening

Accessories

Code	Quantity	Dimensions	Location	Description
ACIP012A	4 pcs		1..4	Corner 3.1 14mm
ACIP012B	4 pcs		1..4	Corner 3.1 20mm
ACIP022A	4 pcs		A	Corner 3.1 8mm
ACIP022B	4 pcs		A	Corner 3.1 27.9mm
ACIP057	6 pcs		A	Window sill piece - load-bearing

Code	Quantity	Dimensions	Location	Description
ACVG45Z	2 pcs		3	Drainage insert, black
ACVL020A	8 pcs		1..4+A	Framing square aluminium

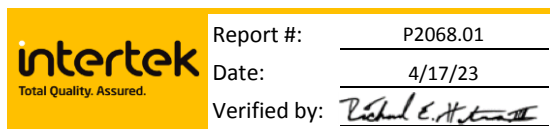
Hardware

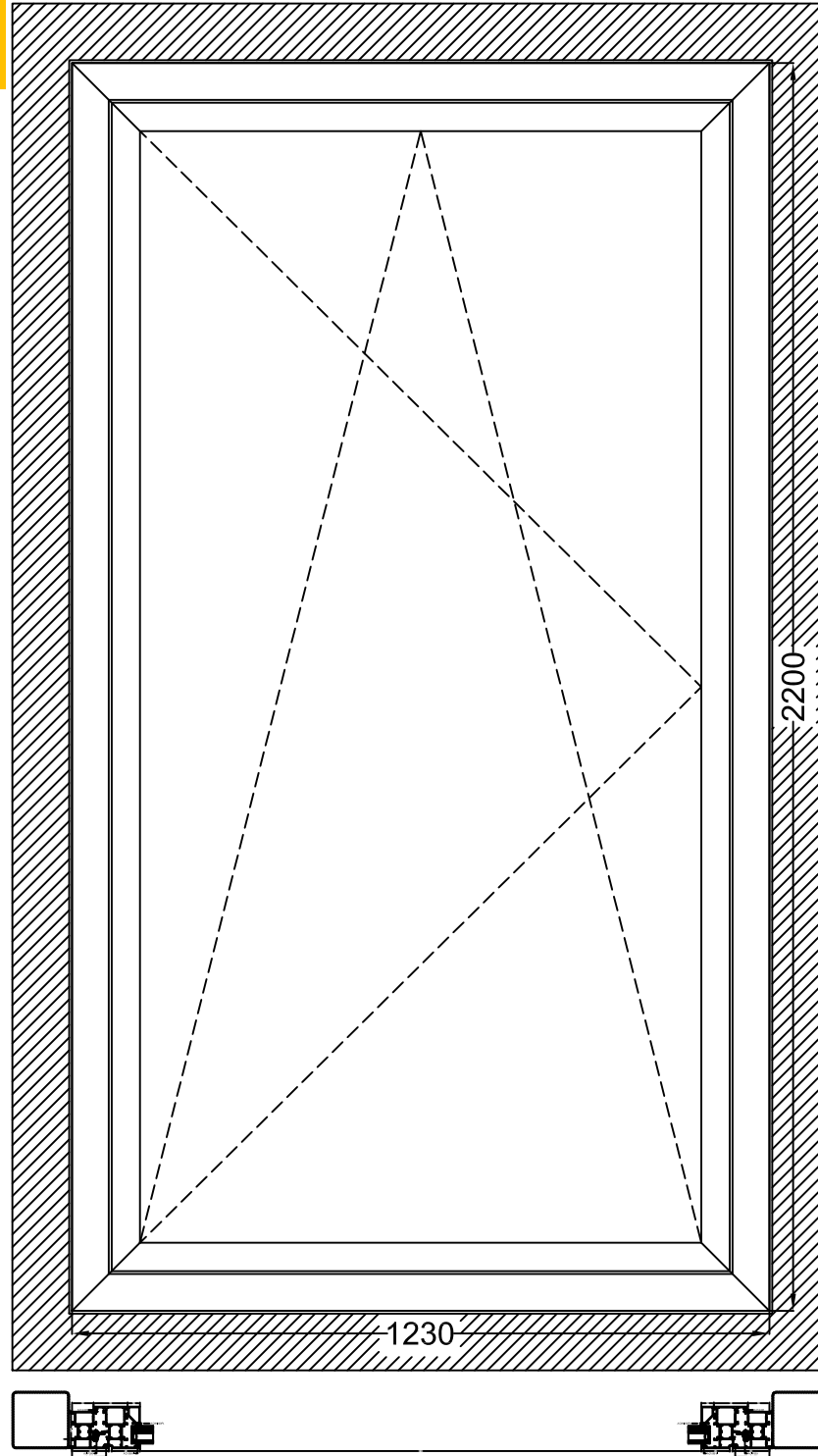
Code	Quantity	Dimensions	Location	Description
ACMAS203	1 pcs		A	Compass arms R/U 650-1700 MM - A3400.22
ACMAS211 S	1 pcs		A	Basic set 3d, 160 kg - 3420.1
ACMAS217	3 pcs		A	Adjustable catch for Ween hardware - 3620.7
ACMAS28	3 pcs		A	Master additional locking point with
ACMAS280	1 pcs		A	Additional corner + locking point with adjustable catch - A3400.31
ACMAS29	1 pcs		A	Master accessories for comfort handle - a6110.3
ACMAS33 S	1 pcs		A	MASTER WINDOWS HANDLE COMFORT INTER

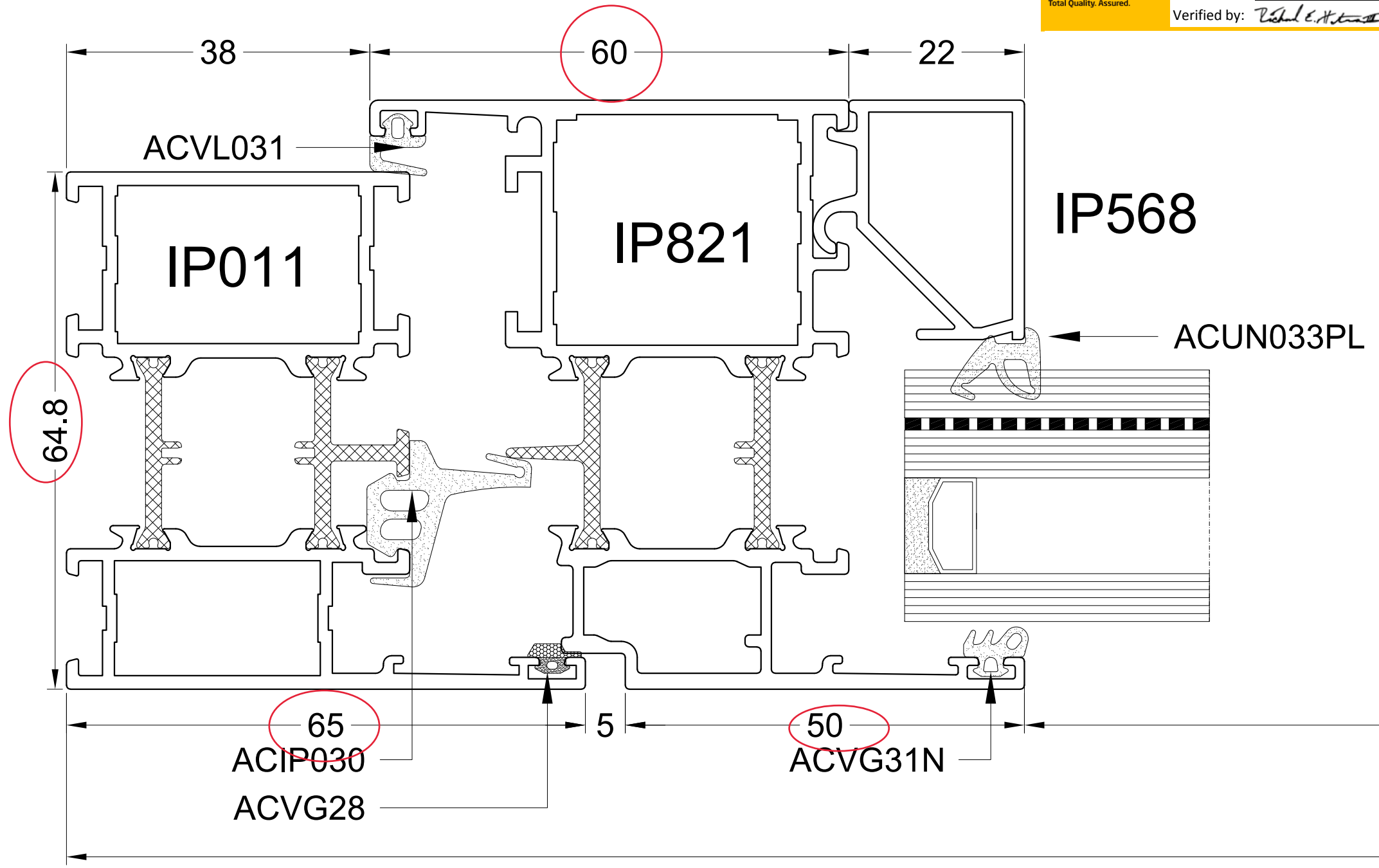
Glazing and plates

Code	Quantity	Dimensions	Location	Description
66.2/14/6	1 pcs	1 020mm x 1 990mm 2,0m2	1	24 mm – standardowa szyba zespolona

Please check all results in terms of quantity, quality and construction strength. The print is not binding.









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SECTION 13

REVISION LOG

REVISION #	DATE	PAGES	REVISION
0	04/18/23	N/A	Original Report Issue