

Fenestration Testing Laboratory, Inc.

10235 8th Street, Rancho Cucamonga, CA 91730

Report #: T23-044

REPORT SUMMARY

REPORT #

T23-044

TESTED FOR

International Window Corporation
2455 Wardlow Rd.
Corona, CA 92880

SERIES & PRODUCT TYPE

8220 - THERMALLY BROKEN ALUMINUM CASEMENT COMPOSITE WINDOW

CONFIGURATION

X0

FRAME SIZE

2438.40 mm x 1828.80 mm (96.00" x 72.00")

SPECIFICATION

NAFS - North American Fenestration Standard/specification for windows, doors, and skylights
AAMA/WDMA/CSA 101/I.S.2/A440-17

PRIMARY DESIGNATOR

CLASS R-PG30 2438.40 x 1828.80 mm (96.00 x 72.00 in) Type: C

TEST COMPLETION DATE

May 19, 2023

REPORT DATE

July 19, 2023

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1.0 Tested For: International Window Corporation
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2.0 Purpose:
The purpose of this report is to present the testing methods employed and the test results obtained during the performance testing of one (1) THERMALLY BROKEN ALUMINUM CASEMENT COMPOSITE WINDOW described in paragraph 5.0 of this report.

3.0 Test References:

- 3.1** NAFS - North American Fenestration Standard/specification for windows, doors, and skylights AAMA/WDMA/CSA 101/I.S.2/A440-17
- 3.2** ASTM F 588-14 Forced Entry Resistance Tests for Windows
- 3.3** CAWM 301-90(1995) Forced Entry Test for Windows (CMBSO 1-79)

4.0 Compliance Statement: The test results in paragraph 6.0 indicate that the test sample described in paragraph 5.0 of this report met the performance requirements of the above specifications for the performance grade shown in 4.1 below.

4.1 CLASS R-PG30 2438.40 x 1828.80 mm (96.00 x 72.00 in) Type: C

5.0 Sample Submitted:

5.1 Product Type: THERMALLY BROKEN ALUMINUM CASEMENT COMPOSITE WINDOW

5.2 Series: 8220

5.3 Configuration: XO

5.4 Product Dimensions:	Millimeters	Inches
Total Frame:	2438.40 x 1828.80	96.00 x 72.00
Fixed Sash:	1638.30 x 1794.00	64.50 x 70.63
Active Sash:	723.90 x 1794.00	28.50 x 70.63

5.5 Glass and Glazing:

<i>IGU Thickness</i>	<i>Spacer Size</i>	<i>Interior Lite</i>	<i>Exterior Lite</i>	<i>Glazing method</i>
For Fixed Sash				Outside glazed: double-sided adhesive foam tape; Rubber setting block were set at quarter points on the sill.
0.75" overall wide	3/8"	3/16" Annealed	3/16" Annealed	
For Active Sash				Aluminum glazing stop applied full perimeter on the outside of the IGU. Roll-in glazing gasket applied full perimeter between stop and glass.
0.75" overall wide	1/2"	1/8" Annealed	1/8" Annealed	

5.6 Weepage:

<i>Drainage Method</i>	<i>Size</i>	<i>Quantity</i>	<i>Location</i>
Vertical round weep	1/8" diameter	One set of three (3) 1/8" diameter weeps at each end of each bottom rail	Vent and fixed bottom rails each had three 1/8" diameter weeps at each end.
The vent sash weather strip was notched off 1" at each end of the bottom rail.			

5.7 Pressure balancing: None

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5.8 Weather-stripping:

<i>Type</i>	<i>Quantity</i>	<i>Location</i>
Flexible leaf vinyl	Two (2) strips	One strip full perimeter of the vent sash. At the bottom rail, the weather-strip was notched off 1" at each end. One strip full perimeter of the fixed sash.
Foam filled bulb	Two (2) strips	One strip full perimeter of the frame vent sash opening facing out. One strip full perimeter of the frame fixed sash opening facing out.

5.9 Sealants:

<p>Sealant was applied at the following locations:</p> <ul style="list-style-type: none">-Roto-operator base was set in sealant to the sill bottom wall and sealed to sill inside leg opening full perimeter. The fasteners at the base were sealed over.-All frame corners were sealed full profile.-All vent corner were sealed full profile.-All hinge fasteners to the frame hinge jamb were set in sealant.-The vertical mullion was sealed to the head and sill full profile.-All fasteners for frame corners, for vent corners, for mullion to frame were set in sealant and heads sealed over.-Vent corner keys were set in sealant.-The cam lock handle was sealed to the mullion.-Fasteners for aluminum channel applied into the frame at the fixed sash opening were all sealed over where they penetrated the frame.

5.10 Hardware:

<i>Type</i>	<i>Quantity</i>	<i>Location</i>
3.25" offset two leaf butt hinges	Four (4)	Hinge jamb at 6.25" and 26" from each end. Each hinge leaf was fastened with three #8 x 0.75" PFH screws to the frame jamb and into a 6" x 1" x 1" x 1/8" aluminum angle backer. Each angle was fastened to the nail-on fin with a pair of screws. The other hinge leaf of each hinge fit into a fabricated slot in the vent hinge stile and was fastened to it with three #8 x 0.75" PFH screws.
Roto-operator, track and corner pivot assembly.	One (1)	The roto-operator fit through a fabricated slot in the sill inside leg and was fastened to the sill bottom wall with eight (8) #8 x 0.75" PFH screws. The operator arm roller fit into metal track fastened to the vent bottom rail and another arm snap fit into a metal corner pivot fastened to the vent bottom rail with four screws.
Metal four-point lock system and keepers	One (1)	The lock consisted of a metal cam handle that fit through a fabricated slot in the mullion and was linked to a metal slide rod. The lock cam handle was fastened to the mullion with a pair of screws applied from the outside through a metal retainer and into the cam handle screw races. The cam operated a slide rod that contained four lock pins. The slide rod moved through and was supported by eight plastic retainers. Each retainer was fastened to the mullion with a pair of #10 x 0.75" PFH screws. When locked, each lock pin engaged its respective plastic strike fastened to the vent lock stile. Each strike was fastened with three #10 x 0.75" PFH screws and were located on the lock stile at 6.25", 24.5", 43.5" and 62.5" from the bottom.

5.11 Construction:

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<i>Location</i>	<i>Joinery Type</i>	<i>Number of Screw Fasteners</i>	<i>Fastener Size</i>
Frame corners	Mechanically joined with screws	Three (3) per corner	#6 x 1.25" PPH
Sash corners	Mitered, keyed with one key each, and fastened with screws	Two (2) per corner	#8 x 1" PPH
Mullion to head and sill	Mechanically joined with screws	Six (6) per end	#6 x 1.25" PPH
The fixed sash was fastened with screws applied through the glazing shelf and into aluminum channel with five #8 x 1.25" PPH screws per side. The aluminum channel was 3" long and each channel was fastened with a pair of #6 x 3/8" PPH screws to the frame at a count of five per side at head, sill, jamb, and mullion.			

5.12 Reinforcement: None

5.13 Installation:

<i>Location on frame</i>	<i>Anchor type</i>	<i>Spacing</i>
The window was fastened to a 2" x 6" wooden rough opening with screws applied through the integral nail-on fins.	#8 x 1.5" PFH	3" from each end and 10" on center. Wood furring applied over the nail-on fins and fastened with screws to the rough opening.

6.0 - Test procedures and results: All testing procedures were performed in accordance with the performance requirements of the test specifications referenced in paragraph 3.0 of this report. The number preceding each test listed below refer to the corresponding sections in the NAFS.

9.3.1 - Operation Force (ASTM E2068-00(2022))

Test Description	Results	Allowed	Comments
Maximum force to initiate motion	25.35 N (5.70 lbf)	60 N (13.49 lbf)	
Maximum force to maintain motion	20.01 N (4.50 lbf)	30 N (6.74 lbf)	
Latching device force	19.12 N (4.30 lbf)	100 N (22.48 lbf)	

9.3.2 - Air Infiltration (ASTM E283/E283M-19)

Test Description	Results	Allowed	Comments
75 Pa differential pressure	0.40 L/s*m ²	1.5 L/s*m ²	
1.57 psf differential pressure	0.08 cfm/ft ²	0.30 cfm/ft ²	
The tested specimen meets the performance levels specified in AAMA/WDMA/CSA 101/1.S.2/A440 for air leakage resistance.			

9.3.3 - Water Penetration (ASTM E547-00(2016))

Test Description	Results	Allowed	Comments
DP30 - 220 Pa (4.59 psf)	No water penetration	No water penetration	1

9.3.4.2 - Uniform Load Deflection at Design Pressure (ASTM E330-14)

Test Description	Results	Allowed	Comments
DP30 - 1440 Pa (30.08 psf)Pos	4.83 mm (0.19")	Report only	2
DP30 - 1440 Pa (30.08 psf)Neg	3.30 mm (0.13")	Report only	2

9.3.4.3 - Uniform Load Structural Overload (OL) at 1.5 x Design Pressure (ASTM E330-14)

Test Description	Results	Allowed	Comments
OL for DP30 - 2160 Pa (45.11 psf)Pos	0.25 mm (0.01")	7.11 mm (0.28")	2
OL for DP30 - 2160 Pa (45.11 psf)Neg	0.25 mm (0.01")	7.11 mm (0.28")	2

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9.3.5 – Forced Entry Resistance (ASTM F588-14 & CAWM 301-90(1995))

Test Description	Results	Allowed	Comments
ASTM F588 Type B and CAWM 301 Type II	No Entry	No Entry	

9.3.6.4.2 – Sash Vertical Deflection Test

Test Description	Results	Allowed	Comments
For R and LC - 200 N (44.96 lbf)	0.76 mm (0.03")	≤ 14.48 mm (0.57")	

9.3.6.5.2 – Casement hardware load test

Test Description	Results	Allowed	Comments
For R - 240 N (5.01 psf)	Passed	Sash operates/No damage	3

Comment #1 - Internal screen not a factor in test.

Comment #2 - Deflection measurement taken from vertical mullion.

Comment #3 - Section 9.3.6.5.2 states "At the conclusion of the test, the sash shall properly and fully close. There shall be no failure of screws, track, or hinge, or permanent deformation of support arms." This is the criteria applied by stating "Passed" under "Results".

Testing was witnessed by: Jim Cruz with FTL and Bill Tancordo with IWC.

For a complete description of the tested sample, refer to the attached twenty (20) pages consisting of bill of materials, cross section drawings, and die drawings. This report is complete only when all the above referenced bill of materials and drawings are attached.

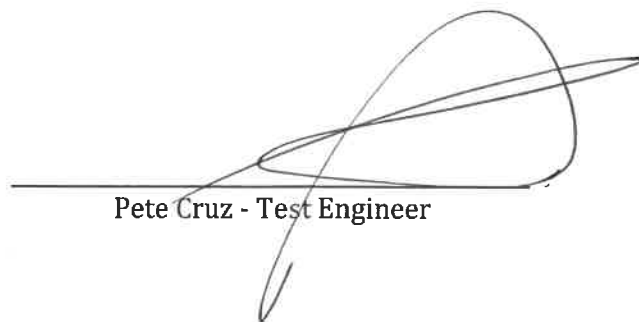
The bill of materials, cross section drawings, and die drawings of frame and sash members are on file and have been compared to the sample submitted. Test sample sections, bill of materials, drawings and a copy of this report will be retained at the test laboratory for four years.

This test report may not be modified in any way without the written consent of Fenestration Testing Laboratory, Inc (FTL).

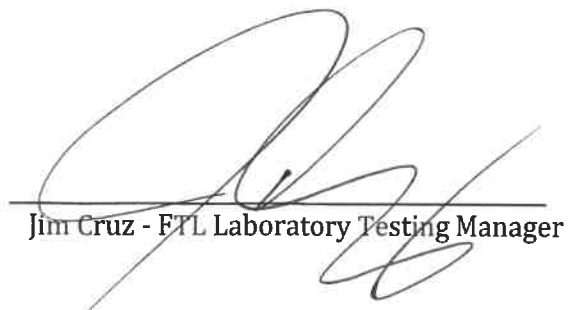
The preceding test results relate only to the tested specimen and were obtained by using the applicable test methods listed in section 3.0 and 6.0 above. This report does not constitute certification of this product or an endorsement by this laboratory. It is the property of the client named in section 1.0 above. Certification can only be granted by an approved administrator and/or validator.

Test Completion Date: May 19, 2023

Report Completion Date: July 19, 2023



Pete Cruz - Test Engineer



Jim Cruz - FTL Laboratory Testing Manager