

# Fenestration Testing Laboratory, Inc.

10235 8<sup>th</sup> Street, Rancho Cucamonga, CA 91730

Report #: T18-107

## REPORT SUMMARY:

**REPORT #:**

T18-107

**TESTED FOR:**

International Window Corporation  
1551 Orangethorpe Ave.  
Fullerton, CA 92831

**SERIES & PRODUCT TYPE:**

8220C - THERMALLY BROKEN ALUMINUM CASEMENT WINDOW

**CONFIGURATION:**

XO

**FRAME SIZE:**

2438.40 mm x 1524.00 mm (96.00" x 60.00")

**SPECIFICATION:**

NAFS - North American Fenestration Standard/specification for windows, doors, and skylights  
AAMA/WDMA/CSA 101/IS.2/A440-11

**PRIMARY DESIGNATOR:**

CLASS LC-PG30 2438.40 x 1524.00 mm (96.00 x 60.00 in) Type: C

**TEST COMPLETION DATE:** December 28, 2018

**REPORT DATE:** January 2, 2018

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**1.0 Tested For:** International Window Corporation  
1551 Orangethorpe Ave.  
Fullerton, CA 92831

**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 WINDOW described in paragraph 4.0 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/A440-11
- 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 LC-PG30 2438.40 x 1524.00 mm (96.00 x 60.00 in) Type: C

**5.0 Sample Submitted:**

**5.1 Product Type:** THERMALLY BROKEN ALUMINUM CASEMENT WINDOW

**5.2 Series:** 8220C

**5.3 Configuration:** XO

<b>5.4 Product Dimensions:</b>	<b>Millimeters</b>	<b>Inches</b>
Total Frame:	2438.40 x 1524.00	96.00 x 60.00
Fixed Sash:	1606.55 x 1489.20	63.25 x 58.63
Active Sash:	762.00 x 1489.20	30.00 x 58.63

**5.5 Glass and Glazing:** (Applies to fixed and active sash)

<i>IGU Thickness</i>	<i>Spacer Type</i>	<i>Interior Lite</i>	<i>Exterior Lite</i>	<i>Glazing method</i>
0.75" overall wide	Metal "U" shaped	1/8" Annealed	1/8" Annealed	Outside glazed: double-sided adhesive foam tape Rubber setting blocks were set at quarter points on the bottom rail. Aluminum glazing stop applied full perimeter on the outside of the IGU. Roll-in glazing gasket was applied full perimeter between the stops and the glass.

**5.6 Weepage:**

<i>Drainage Method</i>	<i>Size</i>	<i>Quantity</i>	<i>Location</i>
Vertical weep hole	1/8" diameter	4	The vent and fixed bottom rails each contained a weep at each end.
Gravity drain	N/A	N/A	The vent bottom rail had no weather-stripping

**5.7 Pressure balancing:** None

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## 5.8 Weather-stripping:

<i>Type</i>	<i>Quantity</i>	<i>Location</i>
Foam-filled bulb vinyl – 0.3" high	See "Location"	Frame inside leg – casement opening full perimeter facing out and fixed sash opening full perimeter facing out.
Leaf vinyl	See "Location"	Active (vent) sash – stiles and top rail. Fixed sash – full perimeter

## 5.9 Sealants:

Sealant was applied at the following locations:

- All frame corners, mullion to frame joints, and fixed and active corners full profile.
- Sash corner keys were set in sealant.
- The roto-operator base was set in sealant and fastened to the sill. The operator was also sealed to the sill leg inside surface where the operator fit through a fabricated hole in the sill leg.
- All fasteners for the fixed sash "Picture adapters" were sealed where they went through the frame.

## 5.10 Hardware:

<i>Type</i>	<i>Quantity</i>	<i>Location</i>
Aluminum two leaf butt hinge	Three (3)	Hinge jamb – 6.5" from each end and at mid-span. Each hinge was fastened with three (3) #8 x 0.75" PFH screws per leaf - one leaf to frame and one to stile. The leaf that was fastened to the vent sash fit through a milled slot in the sash stile. An aluminum "L" extrusion 7/8" x 1" x 1/8" thick x 6" long was fastened to the nail-on fin at each hinged point along the hinge jamb and the hinge fasteners went through the jamb and into the "L"
Truth Dual arm roto-operator	One (1)	The operator fit through a milled slot in the sill leg and was fastened to the sill with eight (8) screws - #8 x 0.75" PFH. One operator arm engaged a brake fastened to the bottom rail with four screws and the other arm had a bushing that fit into a track fastened to the vent bottom rail with a pair of #8 x 7/16" screws.
4 point lock system	One (1)	The lock handle fit through a milled slot in the integral vertical mullion 11" from the bottom of the window and was fastened with a pair of screws from the exterior through a metal retainer and into the lock. The handle operated a metal bar that slid through five plastic guides/retainers. Each guide was fastened with a pair of screws to the mullion. Each lock pin engaged its respective plastic keeper on the vent lock stile. Each keeper was fastened with three #10 x 0.75" PPH screws; a keeper was located at 6.0", 24.5", 43.5" and 56.5" from the bottom of the lock stile.

## 5.11 Construction:

<i>Location</i>	<i>Joinery Type</i>	<i>Number of Fasteners</i>	<i>Fastener Size</i>
Frame corners	Mechanically joined	Three (3)	#6 x 1.25" PPH
Fixed sash and vent sash corners	Mitered, keyed, and mechanically joined with screws	Two (2) screws per corner and one aluminum key per corner	#8 x 1.25" PPH

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5.11 Construction (Continued)			
Location	Joinery Type	Number of Fasteners	Fastener Size
Vertical mullion to frame	Mechanically joined with screws	Five (5) at each end	#6 x 1.25" PFH
The fixed sash was fastened to four aluminum extrusion spacer/adapters per side; one #8 x 1.25" PPH screw per adapter. Each adapter was fastened to the frame with a pair of #6 x 7/16" PPH screws.			

5.12 Reinforcement: None

5.13 Installation:

Location on frame	Anchor type	Spacing
Full perimeter through the nail-on fin	#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(2016))

Test Description	Results	Allowed	Comments
Maximum force to initiate motion	35.58 N (8.00 lbf)	Report only	
Maximum force to maintain motion	15.56 N (3.50 lbf)	30 N (6.74 lbf)	
Latching device force	42.25 N (9.50 lbf)	100 N (22.48 lbf)	

### 9.3.2 - Air Infiltration (ASTM E283-04(2012))

Test Description	Results	Allowed	Comments
75 Pa differential pressure	0.25 L/s*m <sup>2</sup>	1.5 L/s*m <sup>2</sup>	
1.57 psf differential pressure	0.05 cfm/ft <sup>2</sup>	0.30 cfm/ft <sup>2</sup>	
The tested specimen meets the performance levels specified in AAMA/WDMA/CSA 101/I.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	2.54 mm (0.10")	Report only	2
DP30 - 1440 Pa (30.08 psf) Neg	2.54 mm (0.10")	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	0.51 mm (0.02")	5.84 mm (0.23")	2
OL for DP30 - 2160 Pa (45.11 psf) Neg	0.51 mm (0.02")	5.84 mm (0.23")	2

Auxiliary hardware tests for a larger casement of the same series were conducted - See FTL report T15-002

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

Comment #2 - Deflection measurement taken from the vertical integral mullion.

Testing was witnessed by: Jim Cruz and Daniel Orosco with FTL.

For a complete description of the tested sample, refer to the attached sixteen (16) 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.

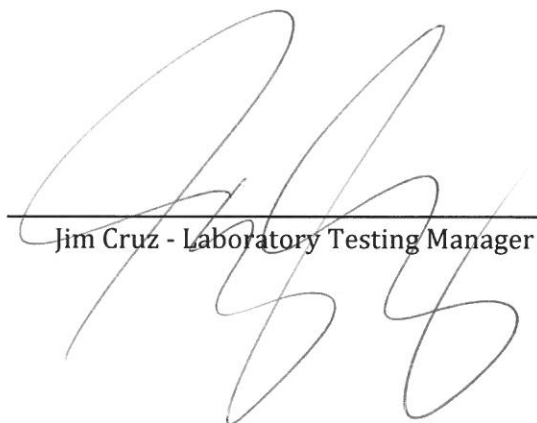
**Test Completion Date:** December 28, 2018

**Report Completion Date:** January 2, 2018



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Pete Cruz - Test Engineer



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Jim Cruz - Laboratory Testing Manager