

**AAMA/WDMA/CSA 101/LS.2/A440-05
TEST REPORT**

Rendered to:

INTERNATIONAL WINDOW CORPORATION

SERIES/MODEL: 6222C EL

PRODUCT TYPE: Aluminum XO Casement Window

Title	Summary of Results
Primary Product Designator	C-R40 2437 x 1525 (96 x 60)
Design Pressure	±2160 Pa (±40.05 psf)
Operating Force (in motion)	4 N (1.0 lbf)
Air Infiltration	<0.1 L/s/m ² (<0.01 cfm/ft ²)
Water Penetration Resistance Test Pressure	290 Pa (6.06 psf)
Uniform Load Structural Test Pressure	±2880 Pa (±60.15 psf)
Forced Entry Resistance	ASTM F 588 – Grade 10 CAWM 301

Test Completion Date: 03/03/10

Reference must be made to Report No. 98325.01-301-44, dated 05/11/10 for complete test specimen description and data.

AAMA/WDMA/CSA 101/I.S.2/A440-05 TEST REPORT

Rendered to:

INTERNATIONAL WINDOW CORPORATION
5625 East Firestone Boulevard
South Gate, California 90280

Report No.: 98325.01-301-44
Test Dates: 05/15/08
Through: 03/03/10
Report Date: 05/11/10
Expiration Date: 03/03/14

Project Summary: Architectural Testing, Inc. was contracted by International Window Corporation to perform testing on a Series/Model 6222C EL, Aluminum XO Casement Window. The sample tested successfully met the performance requirements for a C-R45 2437 x 1525 (96 x 60) rating. Test specimen description and results are reported herein. The sample was provided by the client.

Test Specifications: The test specimen was evaluated in accordance with the following:

AAMA/WDMA/CSA 101/I.S.2/A440-05, Standard/Specification for Windows, Doors, and Unit Skylights.

CAWM 301, Forced Entry Resistance Tests for Windows.

Test Specimen Description:

Series/Model: 6222C EL

Product Type: Aluminum XO Casement Window

Overall Size: 2437 mm (95-15/16") wide by 1525 mm (60-1/16") high

Vent Size: 916 mm (36-1/16") wide by 1487 mm (58-9/16") high

Fixed Lite Daylite Opening Size: 1393 mm (36-1/16") wide by 1445 mm (56-7/8") high

Overall Area: 3.72 m² (40.00 ft²)

Finish: All aluminum was painted white.

Test Specimen Description: (Continued)

Frame Construction: All members were constructed of extruded aluminum. The corners were mitered and secured using two #6 x 1-1/4" Phillips oval head screws. The corners were sealed using seam sealer (part #SP6220). The vertical mullion was secured at each end using four #6 x 1-1/4" Phillips oval head screws and sealed. A glazing bead adapter was employed at the fixed window and secured with four #8 x 7/8" Phillips pan head self-drilling screws 2-3" from each end and 12-1/2" – 19" on center. The screws were sealed at the exterior of the frame with seam sealer. The corners of the vent gasket were sealed with PVC glue.

Vent Construction: All members were constructed of extruded aluminum. The corners were mitered and secured using metal corner keys and two #6 x 1-1/4" Phillips oval head screws and sealed with seam sealer. The corner keys were secured using two #8 x 1/2" Phillips pan head self-drilling screws. A glazing bead adapter was employed and secured with #8 x 1/2" Phillips pan head self-drilling screws 4" from each end at the rails and 5" from each end and midspan at each stile.

Weatherstripping:

<u>Description</u>	<u>Quantity</u>	<u>Location</u>
Single leaf rubber gasket	1 Row	Top rail, lock stile, and hinge stile except between bottom butt hinge and bottom rail.
Hollow bulb gasket	1 Row	All members of the frame and each side of the mullion. The corners of the gasket were sealed with silicone (part #SP6218).

Glazing Details: The window utilized 3/4" thick overall sealed insulating glass. The fixed insulating glass was comprised of two 3/16" thick clear annealed sheets with a U-shaped coated steel dual seal (CU-D) spacer system. The vent insulating glass was comprised of two 1/8" thick clear annealed sheets with a U-shaped coated steel dual seal (CU-D) spacer system. The glass was exterior glazed onto a 1/2" wide x 1/16" thick glazing tape and secured with a snap-in extruded aluminum glazing bead with rubber gasket.

Drainage: The jamb glazing bead adapter for fixed lite was held back 1/4" from each end.

Test Specimen Description: (Continued)

Hardware:

<u>Description</u>	<u>Quantity</u>	<u>Location</u>
Butt hinges (part #AS6210)	3	5-1/2", 29-1/2" and 53-1/2" from the sill at the hinge jamb secured to the frame with one #8 x 1" Phillips flat head self-drilling screw and two #8 x 3/4" Phillips flat head screws. The screws were sealed with seam sealer at the exterior of the frame. The hinges were secured to the vent with three #8 x 3/4" Phillips flat head screws.
Lock (part #SP3038)	2	15" from each end secured through the frame with two #8 x 3/8" Phillips pan head screws through the bracket (part #50107) and into the frame. The lock was sealed on the exterior side with seam sealer (part #SP6220) and on the interior side with a foam gasket.
Keepers (part #SP2818)	2	Opposite each lock secured to the vent with two #8 x 3/8" Phillips pan head screws screws.
Operator (part #SP6211)	1	5" from the jamb secured through the frame with four #10-24 x 3/8" Phillips pan head screws and to the vent with two #8 x 1/2" Phillips pan head self-drilling screws. The operator was sealed to the frame with a foam gasket.

Reinforcement: No reinforcement was utilized.

Installation: The window was installed into a 2 x 8 test buck constructed of Douglas Fir No. 2 lumber. The nailing fin was set against the test buck and secured using #6 x 1-5/8" drywall screws located 4" from each corner and 10" on center. The rough opening was 1/2" wider and a 3/8" taller than the window. The nailing fin was sealed to the test buck with silicone.

Test Results: The temperature during testing was 21°C (69°F). The results are tabulated as follows:

<u>Paragraph</u>	<u>Title of Test - Test Method</u>	<u>Results</u>	<u>Allowed</u>
5.3.1	Operating Force per ASTM E 2068		
	<u>Open</u>		
	Initiate motion	27 N (6.0 lbf)	Report Only
	Maintain motion	4 N (1.0 lbf)	30 N (6.7 lbf)
	Top Latch	22 N (5.0 lbf)	100 N (22.5 lbf)
	Bottom Latch	22 N (5.0 lbf)	100 N (22.5 lbf)
	<u>Close</u>		
	Initiate motion	13 N (3.0 lbf)	Report Only
	Maintain motion	4 N (1.0 lbf)	30 N (6.7 lbf)
	Top Latch	13 N (3.0 lbf)	100 N (22.5 lbf)
	Bottom Latch	22 N (5.0 lbf)	100 N (22.5 lbf)
5.3.2.1	Air Leakage Resistance per ASTM E 283 75 Pa (1.57 psf)	<0.1 L/s/m ² (<0.01 cfm/ft ²)	1.5 L/s/m ² (0.3 cfm/ft ²) max.

Note #1: *The tested specimen meets (or exceeds) the performance levels specified in AAMA/WDMA/CSA 101/I.S.2/A440-05 for air leakage resistance.*

5.3.3.2	Water Penetration Resistance per ASTM E 547	See Note #2
5.3.4.2	Uniform Load Deflection per ASTM E 330	See Note #2
5.3.4.3	Uniform Load Structural per ASTM E 330	See Note #2

Note #2: *The client opted to start at a pressure higher than the minimum required. Those results are listed under "Optional Performance".*

Test Results: (Continued)

<u>Paragraph</u>	<u>Title of Test - Test Method</u>	<u>Results</u>	<u>Allowed</u>
5.3.5	Forced Entry Resistance per ASTM F 588 Type: B	Grade: 10	
	Disassembly Test	No entry	No entry
	Test B1	No entry	No entry
	Test B2	No entry	No entry
	Test B3	No entry	No entry
	Vent Manipulation Test	No entry	No entry
	Lock Hardware Manipulation Test	No entry	No entry
	Forced Entry Resistance per CAWM 301 Type: II		
	Disassembly Test	No entry	No entry
	Test A	No entry	No entry
	Test B	No entry	No entry
	Test C	No entry	No entry
	Test E	No entry	No entry
5.3.6.4.3	Sash Vertical Deflection Test 200 N (45.0 lbf)	8.0 mm (0.32")	18.3 mm (0.72") max.
5.3.6.6.2	Distributed Load Test 240 Pa (5.01 psf)	No damage	No damage
<u>Optional Performance</u>			
4.4.2.6	Water Penetration Resistance per ASTM E 547 (With and without insect screen) 290 Pa (6.06 psf)	No leakage	No leakage

Test Results: (Continued)

<u>Paragraph</u>	<u>Title of Test - Test Method</u>	<u>Results</u>	<u>Allowed</u>
4.4.2.6	Uniform Load Deflection per ASTM E 330 (Deflections were taken on the mullion) (Loads were held for 10 seconds)		
	2160 Pa (45.11 psf) (positive)	4.0 mm (0.16")	See Note #2
	2160 Pa (45.11 psf) (negative)	5.0 mm (0.20")	See Note #2
4.4.2.6	Uniform Load Structural per ASTM E 330 (Permanent sets were taken on the mullion) (Loads were held for 10 seconds)		
	2880 Pa (60.15 psf) (positive)	0.3 mm (0.01")	6.1 mm (0.24") max.
	2880 Pa (60.15 psf) (negative)	0.0 mm (0.00")	6.1 mm (0.24") max.

Note #2: *The deflections reported are not limited by AAMA/WDMA/CSA 101/I.S.2/A440-05 for this product designation. The deflection data is recorded in this report for special code compliance and information only.*

Tape and film were not used to seal against air leakage during structural testing. In our opinion, the tape and film did not influence the results of the test.

Drawing Reference: The test specimen drawings have been reviewed by Architectural Testing and are representative of the test specimen reported herein.

List of Official Observers:

<u>Name</u>	<u>Company</u>
Dennis Janzen	Architectural Testing, Inc.
Derek Spencer	Architectural Testing, Inc.
Jeffrey T. Osugi	Architectural Testing, Inc.

Detailed drawings, data sheets, representative samples of test specimens, a copy of this report, or other pertinent project documentation will be retained by Architectural Testing, Inc. for a period of four years from the original test date. At the end of this retention period, such materials shall be discarded without notice and the service life of this report will expire.

Results obtained are tested values and were secured by using the designated test methods. If test specimen contains glazing, no conclusions of any kind regarding the adequacy or inadequacy of the glass in the test specimen can be made. This report does not constitute certification of this product nor an opinion or endorsement by this laboratory. It is the exclusive property of the client so named herein and relates only to the specimen(s) tested. This report may not be reproduced, except in full, without the written approval of Architectural Testing, Inc.

For ARCHITECTURAL TESTING, INC.



Digitally Signed by: Jeffery Osugi

Jeffrey T. Osugi
Technician



Digitally Signed by:Kenny C. White

Kenny C. White
Laboratory Manager

JO: ms

Attachments (pages): This report is complete only when all attachments listed are included.

- Appendix-A: Alteration Addendum (1)
- Appendix-B: Test Equipment (1)
- Appendix-C: Drawings (14)