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TESTED FOR
INTERNATIONAL WINDOW
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1.0 PURPOSE

The purpose of this report is to present the testing methods employed and the test result obtained during the performance testing of one (1) **Aluminum Casement Window** described in paragraph 4.0 of this report.

2.0 TEST REFERENCES

2.1 NAFS – North American Fenestration Standard/specification for windows, doors, and skylights AAMA/WDMA/CSA 101/I.S.2/A440-08
Class R – PG30 : Size Tested 2426 x 1816 mm (96 x 72 in) Type C

2.2 CAWM 301 – 90 Forced Entry Resistance Tests for Windows.

2.3 ASTM F 588-07 Standard Test Method for Measuring the Forced Entry Resistance of Windows

3.0 SUMMARY

The test results in paragraphs 5.0 and 6.0 indicate that the test sample described in paragraph 4.0 of this report complied with the performance requirements of the above referenced specifications.

4.0 SAMPLE SUBMITTED BY MANUFACTURER

SERIES: **6221 Casement**

CONFIGURATION: XO

FRAME SIZE: 2426 mm x 1816 mm (95.50" x 71.50")

VENT SIZES: 765 mm x 1781 mm (30.13" x 70.13")

FIXED SIZES: 1530 mm x 1737 mm (60.25" x 68.38") Daylight Opening

GLASS: The vent and fixed lite were glazed with 0.75" overall wide insulated glass. The vent lite contained SS annealed on both sides. The fixed lite contained DS annealed on both sides.

SPACER: The vent insulated glass spacer was 0.56" wide and the fixed spacer was 0.50" wide. Both spacers were "U" shaped metal and single sealed.

GLAZING: The vent and fixed lite were each outside drop glazed onto 0.5" x 0.06" double sided adhesive foam tape. The vent contained a rubber setting block at quarter points on the bottom rail and on each stile. The fixed lite was set on a rubber setting block at quarter points on the mullion. A 3" long heavy bead of silicone was applied between the fixed insulated glass unit and each jamb at the mid-span. Aluminum glazing bead was applied the full perimeter of both lites on the outside.

WEEPAGE: The vent bottom rail contained a 0.18" diameter vertical weep at each end. The fixed lite contained a 0.63" x 0.25" weep at each end. It was formed by keeping the 0.63" x 0.63" aluminum 'L' metal which served as a glazing stop retainer for the fixed lite, a 0.25" short of the frame. The sill was able to drain along its entire length by not applying the vent leaf vinyl on the vent bottom rail.

WEATHERING: The frame vent opening contained a strip of offset bulb vinyl full perimeter facing out. The vent contained a strip of leaf vinyl on the top rail, and stiles.

HARDWARE: The vent was supported in each frame with a three bar hinge at the head and sill. Each hinge was fastened to the vent with four #8 x 0.38" PFH screws and to the head and sill respectively with four #7 x 0.5" PFH screws.

The sill contained a scissor roto-operator at mid-span. The operator fit through a slot in the sill and was fastened with a four of #8 x 0.38" PPH screws. The operator arm connected to a metal pivot bolt fastened to the bottom rail with four #8 x 0.75" PFH screws.

The mullion contained a metal cam lock 15" from each end. Each lock fit through a slot in the web. Each lock was fastened with a pair of #8 x 0.38" PPH screws applied from the outside through an aluminum retainer and into the lock. When locked, each lock engaged its respective metal keeper fastened to the vent stile with a pair of #6 x 0.63" PPH screws. The vent panel contained an aluminum lock shield which was placed adjacent to each keeper and fastened using same keeper screws.

CONSTRUCTION: The frame corners were mechanically joined with a pair of #6 x 1" PPH screws. The mullion was fastened to the jamb at each end with four #6 x 1" PPH screws. The vent corners were mechanically joined with a pair of #6 x 1" PPH screws. The fixed lite opening contained a 0.63" x 0.63" aluminum angle, picture window adapter, fastened full perimeter to the frame or mullion which served as a glazing bead retainer and was fastened with six #8 x 0.38" PPH screws per side.

CAULKING: The vent corners, frame corners, and mullion to frame joints were sealed full profile. Each lock to frame joint, and roto-operator housing to frame joint was gasket sealed. In addition the roto-operator housing was wet sealed to the sill. Screw penetrations from the screws fastening the hinges to frame and the 'window adapter' to the frame were sealed on the nail-fin side of the frame.

ANCHORING: The frame nail-on fin was fastened to a 2" x 6" wooden buck with #8 x 1.63" PFH screws every 12 inches on center full perimeter. Wood furring was applied over the nail-on fin full perimeter and screwed into the wooden buck.

5.0 TEST PROCEDURES AND RESULTS

5.1 All testing procedures were performed in accordance with the performance requirements of the test specifications referenced in paragraph 2.0 of this report.

5.2 TEST RESULTS

PARAGRAPH	TEST DESCRIPTION	MEASURED	ALLOWED
5.3.1.1	Operating Force (ASTM E 2068)		
	Breakaway Force	5 N (1.1 lbf)	Reported only
	Operating Force	4 N (0.9 lbf)	30 N (7 lbf)
5.3.1.1.3	Latching Device		
	Open and Close Latch Device	71 N (16.0 lbf)	100 N (22.5 lbf)
5.3.2.1	Air Infiltration (ASTM E 283)		
	75 Pa	0.15 L/s•m^2	1.5 L/s•m^2
	(1.6 PSF)	0.03 CFM/ft^2	0.3 CFM/ft^2

The tested specimen exceeds the performance requirements specified in AAMA/WDMA/CSA 101 / I.S.2 / A440 for air leakage resistance.

5.2 TEST RESULTS

PARAGRAPH	TEST DESCRIPTION	MEASURED	ALLOWED
5.3.3.2	Water Penetration (ASTM E 547)		
	140 Pa (2.9 PSF) Internal screen	No Leakage	No Leakage
5.3.4.2	Uniform Load Deflection (ASTM E 330)		
	720 Pa (15.0 PSF) POS	3.50 mm (0.14")	As measured
	720 Pa (15.0 PSF) NEG	4.25 mm (0.17")	As measured
5.3.4.3	Uniform Load Structural (ASTM E 330)		
	1080 Pa (22.5 PSF) POS	0.00 mm (0.00")	7.00 mm (0.28") Set
	1080 Pa (22.5 PSF) NEG	0.00 mm (0.00")	7.00 mm (0.28") Set
5.3.6.4.3	Sash vertical deflection test		
	200 N (45 lbf.)	1.00 mm (0.04")	15.50 mm (0.61")
5.3.6.6.2	Distributed Load Test		
	240 Pa (5.0 psf)	No Damage	No Damage

5.3 OPTIONAL PERFORMANCE GRADES TEST RESULTS

PARAGRAPH	TEST DESCRIPTION	MEASURED	ALLOWED
5.3.3.2	Water Penetration (ASTM E 547)		
	220 Pa (4.5 PSF) Internal screen	No Leakage	No Leakage
5.3.4.2	Uniform Load Deflection (ASTM E 330)		
	1440 Pa (30.0 PSF) POS	7.50 mm (0.30")	As measured
	1440 Pa (30.0 PSF) NEG	7.25 mm (0.29")	As measured
5.3.4.3	Uniform Load Structural (ASTM E 330)		
	2160 Pa (45.0 PSF) POS	0.00 mm (0.00")	7.00 mm (0.28") Set
	2160 Pa (45.0 PSF) NEG	0.00 mm (0.00")	7.00 mm (0.28") Set

6.0 5.3.5 ASTM F 588 Forced Entry Resistance Test Results For Windows

1.2.2 Type "B" Operable Window Assemblies

Table A1.1 Grade 10

	TEST	RESULTS	ALLOWED
A2.5.1	A2.1	Passed	No Entry
A2.5.2	B1	Passed	No Entry
A2.5.3	B2	Passed	No Entry
A2.5.4	B3	Passed	No Entry
A2.5.1	A2.2	Passed	No Entry
A2.5.1	A2.3	Passed	No Entry
10.2 Fixed Panel			
A2.8.1	A2.1	Passed	No Entry
A2.8.3	A2.3	Passed	No Entry

5.3.5 **CAWM 301 - 90 Forced Entry Resistance Tests for Windows.**

2.4.2 Type "II" Window Assemblies

	TEST	RESULTS	DESCRIPTION
5.2.1		Passed	No Entry
5.2.2	A	Passed	No Entry
5.2.3	B	Passed	No Entry
5.2.4	C	Passed	No Entry
5.2.5	E	Passed	No Entry
5.4 Fixed Panel			
5.4.1	A		
5.4.2	B		

For a complete description of the tested sample refer to the attached ten (10) pages consisting of the bill of materials, cross section drawings, and individual die drawings.
Cross section drawings and die drawings of frame members are on file and have been compared to the sample submitted. Test sample sections, 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.

The preceding test results relate only to the tested specimen and were obtained by using the applicable ASTM and CAWM test methods. This report does not constitute certification of this product. Certification can only be granted by an approved administrator and/or validator.

Testing Completed: June 22, 2010
Report Completed: December 8, 2010

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