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Page : 1 of 4

TESTED FOR

INTERNATIONAL WINDOW CORP.

5625 Firestone Boulevard
South Gate, CA 90280

1.0 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 Combination Awning 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 – PG20: Size Tested 1524 x 2438 mm (60 x 96 in) – Type AP

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

SERIES: 8220 AWN HB

CONFIGURATION: O/X

FRAME SIZE: 1524 mm x 2438 mm (60.00" x 95.98")

VENT SIZE: 1492 mm x 914 mm (58.74" x 35.98")

FIXED SASH SIZE: 1492 mm x 1457 mm (58.74" x 57.36")

GLASS: The insulated glass units each measured 0.75" overall. The vent insulated glass unit contained SS clear annealed glass on both sides. The fixed sash contained DS annealed glass on both sides.

SPACER: The spacers were both "U" shaped metal and single sealed. The vent's IG spacer measured 7/16" and the fixed sash's spacer measured 1/2".

GLAZING: Both lites were outside drop glazed onto 0.06" x 0.38" double sided adhesive foam tape. Rubber setting block was located at quarter points on the bottom of each lite and one block was located at the top end of each stile. On the outside, aluminum glazing stop with roll-in glazing gasket was applied full perimeter of both lites.

WEEPAGE: A flap vinyl weather-strip was not applied to the vent bottom rail and to the fixed sash bottom rail to allow the sill and mullion to drain. The vent bottom rail contained seven 0.18" diameter vertical weeps that went through the extrusion hollow.

WEATHERING: The frame vent opening and the frame fixed sash opening each contained a hollow bulb vinyl full perimeter facing out. The vent and fixed sash each contained a leaf vinyl at the top rail and stiles.

HARDWARE: The vent was supported in the frame by a 3.25" aluminum butt hinge located at 6" from each end and at mid-span of the top rail. Each hinge leaf was fastened with three #8 x 0.75" PFH screws to either the vent top rail or to the mullion.

The vent was operated by a scissor roto-operator located at the mid-span of the sill. The operator fit through a slot in the sill inside leg and was fastened with eight #8 x 0.75" PFH screws to the sill horizontal surface. Each operator arm was attached to a plastic slide shoe that slid along an aluminum track that was fastened to the bottom rail with three #6 x 0.5" PPH screws.

Each jamb contained a metal cam lock which fit through a slot in the jamb 5.75" from the bottom. Each lock was fastened with a pair of #8 x 0.38" PPH that passed through a metal retainer and into the threaded holes in the lock housing. When locked, each lock hook engaged its respective metal keeper. Each keeper was fastened to the stile with a pair of #6 x 3/8" PPH screws.

CONSTRUCTION: The frame corners were mechanically joined with three #6 x 1" PPH screws. The vent and fixed sash corners were each mitered, keyed and mechanically joined with a #6 x 1" PPH screw, a #8 x 0.88" PPH screw. A #8 x 0.5" TEK screw was applied on each side of the inside corner and secured the vent extrusion to each corner key side.

In order to secure the fixed sash to the frame, a 3" long section of aluminum extrusion ("picture adaptor" die drawing # 50542) was fastened at quarter points with a pair of #8 x 0.5" PPH TEK screws to each jamb, head, and mullion forming the fixed sash opening. The unglazed fixed sash was then fastened to each aluminum "picture adaptor" with a pair of #8 x 1" PPH screws.

The mullion was fastened to each jamb with six (6) #6 x 1" PPH screws.

The width of the vent and fixed sash thermal break measured 0.23". The width of the frame and mullion thermal break measured 0.42"

CAULKING: The frame corners, sash corners, and mullion to frame joints were all sealed full profile. The heads of screws fastening the mullion to the frame, and the heads of screws fastening the fixed and vent corners were sealed.

The operator housing was sealed to the sill inside leg with foam gasket. Each cam lock was sealed to its respective jamb with a rubber gasket.

ANCHORING: The frame was mounted in a rough opening constructed of 2" x 6" lumber with #10 x 1.5" PHH screws every 12" on center. Wood furring was applied over the nail-on fins and fastened with screws though to the wooden rough opening.

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**

| <u>PARAGRAPH</u> | <u>TEST DESCRIPTION</u> | <u>MEASURED</u> | <u>ALLOWED</u> |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|---------------------------------------------------|
| 5.3.1.1 | Operating Force (ASTM E 2068) Breakaway Force Operating Force | 27 N (6.1 lbf) 22 N (4.9 lbf) | Report only 100 N (22 lbf) |
| 5.3.1.1.3 | Latching Device Open and Close Latch Device | 44 N (9.9 lbf) | 100 N (22.5 lbf) |
| 5.3.2.1 | Air Infiltration (ASTM E 283) 75 Pa (1.6 PSF) The tested specimen exceeds the performance requirements specified in ASTM/WDMA/CSA 101 / I.S.2 / A440 for air leakage resistance. | 0.1 L/s•m ² 0.02 CFM/ft ² | 1.5 L/s•m ² 0.3 CFM/ft ² |
| 5.3.3.2 | Water Penetration (ASTM E 547) 140 Pa (2.9 PSF) Inside screen | No Leakage | No Leakage |
| 5.3.4.2 | Uniform Load Deflection (ASTM E 330) 720 Pa (15.0 PSF) POS 720 Pa (15.0 PSF) NEG | 0.50 mm (0.02") 1.00 mm (0.04") | Report only Report only |
| 5.3.4.3 | Uniform Load Structural (ASTM E 330) 1080 Pa (22.5 PSF) POS 1080 Pa (22.5 PSF) NEG | 0.00 mm (0.00") 0.00 mm (0.00") | 5.75 mm (0.23 " Set) 5.75 mm (0.23" Set) |
| 5.3.6.6.6 | Awning Hardware Load Test 70 N (15 lbf) | 5.00 mm (0.20") | Report only |

5.3 **OPTIONAL PERFORMANCE GRADES (R20)**

| | | | |
|---------|------------------------------------------------------------------------------------------|------------------------------------|----------------------------------------------|
| 5.3.3.2 | Water Penetration (ASTM E 547) 150 Pa (3.00 PSF) With/without screen | No Leakage | No Leakage |
| 5.3.4.2 | Uniform Load Deflection (ASTM E 330) 960 Pa (20.0 PSF) POS 960 Pa (20.0 PSF) NEG | 1.25 mm (0.05") 2.00 mm (0.08") | As measured As measured |
| 5.3.4.3 | Uniform Load Structural (ASTM E 330) 1800 Pa (30.0 PSF) POS 1800 Pa (30.0 PSF) NEG | 0.00 mm (0.00") 0.00 mm (0.00") | 5.75 mm (0.23 " Set) 5.75 mm (0.23 " 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

| | <u>TEST</u> | <u>RESULTS</u> | <u>ALLOWED</u> |
|--------|-------------|----------------|----------------|
| 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 |

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

2.4.2 Type "II" Window Assemblies

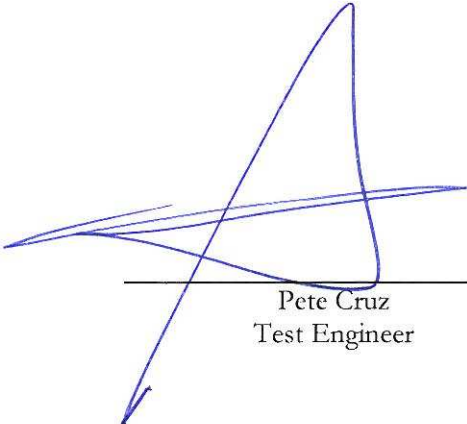
| | <u>TEST</u> | <u>RESULTS</u> | <u>DESCRIPTION</u> |
|-------|-------------|----------------|--------------------|
| 5.2.1 | | Passed | No Entry |
| 5.2.2 | A | Passed | No Entry |
| 5.2.3 | B | Passed | No Entry |
| 5.2.4 | C | Passed | No Entry |
| 5.2.5 | E | Passed | No Entry |

For a complete description of the tested sample refer to the attached sixteen (16) pages consisting of the bill of materials, cross section drawings, and individual die drawings.

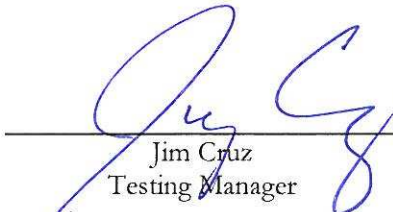
Cross section drawings and die drawings of frame members are on file and have been compared to the sample submitted. Test sample sections, drawings and a copy of this report will be retained at the test laboratory for four years.

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, AAMA, 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: October 5, 2010
Report Completed: December 30, 2010



Pete Cruz
Test Engineer



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