Architectural Testing

TEST REPORT

Report No.: C2902.01-109-47

Rendered to:

MI WINDOWS AND DOORS, INC.
Gratz, Pennsylvania

PRODUCT TYPE: PVC Casement Window
SERIES/MODEL: 9770

SPECIFICATION: AAMA/WDMA/CSA 101/I.S.2/A440-08, *NAFS - North American Fenestration Standard/Specification for Windows, Doors, and Skylights*

Title	Summary of Results
Primary Product Designator	Class LC-PG50 914 x 1829 (36 x 72)-C
Design Pressure	±2400 Pa (±50.13 psf)
Air Infiltration	0.4 L/s/m^2 (0.07 cfm/ft^2)
Water Penetration Resistance Test Pressure	580 Pa (12.11 psf)

Test Completion Date: 10/09/2012

Reference must be made to Report No. C2902.01-109-47, dated 10/23/12 for complete test specimen description and detailed test results. Reference Architectural Testing, Inc. Report No. A4772.01-109-47, dated 01/12/11 for complete *Gateway* test specimen description and test results.

1.0 Report Issued To: MI Windows and Doors, Inc.
P.O. Box 370
650 West Market Street
Gratz, Pennsylvania 17030-0370

2.0 Test Laboratory: Architectural Testing, Inc.
130 Derry Court
York, Pennsylvania 17406-8405
717-764-7700

3.0 Project Summary:

3.1 Product Type: PVC Casement Window

3.2 Series/Model: 9770

3.2.1 This product is also labeled under the following names: 1675 and CTCASE.

3.3 Compliance Statement: Results obtained are tested values and were secured by using the designated test method(s). The specimen tested successfully met the performance requirements for a **Class LC-PG50 914 x 1829 (36 x 72)-C** rating. Reference Architectural Testing, Inc. Report No. A4772.01-109-47, dated 01/12/11 for complete *Gateway* test specimen description and test results.

3.4 Test Dates: 10/08/2012 - 10/09/2012

3.5 Test Record Retention End Date: All test records for this report will be retained until October 23, 2016.

3.6 Test Location: MI Windows and Doors, Inc. test facility in Gratz, Pennsylvania. Calibration of test equipment was performed by Architectural Testing in accordance with AAMA205-01 "In-Plant Testing Guidelines for Manufacturers and Independent Laboratories".

3.7 Test Sample Source: The test specimens were provided by the client. Representative samples of the test specimen(s) will be retained by Architectural Testing for a minimum of four years from the report completion date.

3.8 Drawing Reference: The test specimen drawings have been reviewed by Architectural Testing and are representative of the test specimen(s) reported herein. Test specimen construction was verified by Architectural Testing per the drawings on file with Architectural Testing. Any deviations are documented herein or on the drawings.

3.9 List of Official Observers:

Name	Company
Rick Sawdey	MI Windows and Doors, Inc.
Ken R. Stough	Architectural Testing, Inc.

4.0 Test Specification(s):

AAMA/WDMA/CSA 101/I.S.2/A440-08, *NAFS - North American Fenestration Standard/Specification for Windows, Doors, and Skylights*

5.0 Test Specimen Description:

5.1 Product Sizes:

Overall Area: 1.7 m^2 (18.0 ft^2)	**Width**		**Height**	
	millimeters	**inches**	**millimeters**	**inches**
Overall size	914	36	1829	72
Vent size	875	34-7/16	1789	70-7/16

5.2 Frame Construction:

Frame Member	**Material**	**Description**
Head, sill, and jambs	PVC	Extruded

	Joinery Type	**Detail**
All corners	Mitered	Thermally welded

5.3 Vent Construction:

Vent Member	**Material**	**Description**
Rails and stiles	PVC	Extruded

	Joinery Type	**Detail**
All corners	Mitered	Thermally welded

5.4 Weatherstripping:

Description	**Quantity**	**Location**
0.187" backed by 0.350" high polypile with center fin	1 Row	Vent rails and stiles
0.187" backed by 0.300" high foam-filled bulb seal	2 Rows	Vent rails and stiles

5.0 Test Specimen Description: (Continued)

5.5 Glazing: *No conclusions of any kind regarding the adequacy or inadequacy of the glass in any glazed test specimen(s) can be made.*

Glass Type	Spacer Type	Interior Lite	Exterior Lite	Glazing Method
3/4" IG	Metal reinforced butyl	1/8" clear annealed	1/8" clear annealed	The glass was exterior glazed onto a bead of silicone and secured with PVC snap-in glazing beads

Location	Quantity	Daylight Opening		Glass Bite
		millimeters	inches	
Vent	1	740 x 1651	29-1/8 x 65	5/8"

5.6 Drainage: A step down sill was utilized.

Drainage Method	Size	Quantity	Location
Weepslot	1/8" high by 1/2" wide	2	Vent bottom rail glazing bead, 3-1/4" from each end

5.7 Hardware:

Description	Quantity	Location
Multi-point lock with four keepers	1	Lock stile, with keepers located 3-1/4", 28-3/4", 44-1/2", and 63-1/2" from sill
Metal snubbers (G-CSMT160)	2	Hinge stile, 23-1/2" from sill and 47-1/2" from sill
Roto-operator	1	Sill, 11" from hinge stile
Single bar hinge assembly	2	Hinge stile at each end
Plastic vent guide	1	Sill, 3" from the lock stile

5.8 Reinforcement: No reinforcement was utilized.

6.0 Installation:

The specimen was installed into a Spruce-Pine-Fir wood buck. The rough opening allowed for a 1/8" shim space. The exterior perimeter of the window was sealed with silicone.

Location	Anchor Description	Anchor Location
Head, sill, jambs	#6 x 1-5/8" long drywall screws	Located 1" from corners and spaced 7" on center through the mounting fin into the wood buck

7.0 Test Results: The temperature during testing was 20°C (68°F). The results are tabulated as follows:

Title of Test	Results	Allowed	Note
Operating Force, per ASTM E 2068	Initiate motion: 27 N (6 lbf) Maintain motion: 9 N (2 lbf) Locks: 18 N (4 lbf)	Report Only 30 N (7 lbf) max. 100 N (22.5 lbf) max.	
Air Leakage, Infiltration per ASTM E 283 at 75 Pa (1.57 psf)	0.4 L/s/m² (0.07 cfm/ft²)	1.5 L/s/m² (0.3 cfm/ft²) max.	1
Water Penetration, per ASTM E 547	N/A	N/A	3
Uniform Load Deflection, per ASTM E 330	N/A	N/A	3
Uniform Load Structural, per ASTM E 330	N/A	N/A	3
Forced Entry Resistance, per ASTM F 588, Type: A - Grade: 10	Pass	No entry	7
Thermoplastic Corner Weld	Pass	Meets as stated	7
Sash Vertical Deflection 200 N (45 lbf)	0.8 mm (0.03")	1.5 mm (0.06") max.	7
Distributed Load 300 Pa (6.2 psf)	Pass	No damage	7

7.0 Test Results: (Continued)

Title of Test	Results	Allowed	Note
Optional Performance			
Water Penetration, per ASTM E 547 at 580 Pa (12.11 psf)	Pass	No leakage	2
Uniform Load Deflection, per ASTM E 330 taken between snubbers +2400 Pa (+50.13 psf) -2400 Pa (-50.13 psf)	 0.3 mm (0.01") 1.0 mm (0.04")	 Report Only	4, 5, 6
Uniform Load Structural, per ASTM E 330 taken between snubbers +3600 Pa (+75.19 psf) -3600 Pa (-75.19 psf)	 <0.3 mm (<0.01") 0.5 mm (0.02")	 2.5 mm (0.10") max. 2.5 mm (0.10") max.	 5, 6

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

Note 2: Without insect screen.

Note 3: The client opted to start at a pressure higher than the minimum required. Test results are reported under Optional Performance.

Note 4: The deflections reported are not limited by AAMA/WDMA/CSA 101/I.S.2/A440 for this product designation. The deflection data is recorded in this report for special code compliance and information only.

Note 5: Loads were held for 10 seconds.

Note 6: Tape and film were used to seal against air leakage during structural testing. In our opinion, the tape and film did not influence the results of the test.

Note 7: Reference Architectural Testing Report No. A4772.01-109-47, dated 01/12/11 for secondary testing.

Architectural Testing will service this report for the entire test record retention period. Test records that are retained such as detailed drawings, datasheets, representative samples of test specimens, or other pertinent project documentation will be retained by Architectural Testing, Inc. for the entire test record retention period.

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: Ken R. Stough

Ken R. Stough
Technician

Digitally Signed for: Michael D. Stremmel by Vicki L. McElwain

Michael D. Stremmel, P.E.
Senior Project Engineer

KRS:dem/cmd

Attachments (pages): This report is complete only when all attachments listed are included.
Appendix-A: Alteration Addendum (1)
Appendix-B: Complete drawings packet on file with Architectural Testing, Inc.

Appendix A

Alteration Addendum

Alteration #1: Date – 10/09/12
Cause for alteration – Failed -75.19 psf structural overload test
Remedial action taken – Replaced vent

Appendix B

Drawings

***Note**: Complete drawings packet on file with Architectural Testing, Inc.*