

TEST REPORT

Report No.: A4372.01-109-47

Rendered to:

MI WINDOWS AND DOORS, INC.
Gratz, Pennsylvania

PRODUCT TYPE: Vinyl Double Hung Window (Finless)
SERIES/MODEL: 1650

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-PG35 1016 x 1829* (40 x 72*)-H
Design Pressure	+1680 Pa (+35.30 psf)
Negative Design Pressure	-2400 Pa (-50.13 psf)
Air Infiltration	0.9 L/s/m ² (0.17 cfm/ft ²)*
Water Penetration Resistance Test Pressure	260 Pa (5.43 psf)*

Test Completion Date: 10/06/2010

Reference must be made to Report No. A4372.01-109-47, dated 11/04/10 for complete test specimen description and detailed test results. *Reference Architectural Testing, Inc. Report No. 96724.01-109-47, dated 12/22/09 for complete *Gateway* test specimen description and air infiltration, water penetration 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: 1650

3.2 Series/Model: Vinyl Double Hung Window (Finless)

3.2.1 This product also labeled under the following names: 1555, Bryn Mawr III, and New Castle III

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-PG35 1016 x 1829* (40 x 72*)-H** rating. Reference Architectural Testing, Inc. Report No. 96724.01-109-47, dated 12/22/09 for complete *Gateway* test specimen description and test results.

General Note: *An asterisk (*) next to the size designation indicates that the size tested for optional performance was smaller than the Gateway test size for the product type and class.*

3.4 Test Date: 10/06/10

3.5 Test Location: MI Window and Doors, Inc. test facility in Gratz, Pennsylvania. Calibration of test equipment was performed by Architectural Testing in accordance with AAMA 205-01 "In-Plant Testing Guidelines for Manufacturers and Independent Laboratories".

3.6 Test Sample Source: The test specimen was provided by the client. Representative samples of the test specimen will be retained by Architectural Testing for a minimum of four years from the test completion date.

3.7 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.

3.0 Project Summary: (Continued)

3.8 List of Official Observers:

<u>Name</u>	<u>Company</u>
Rick Sawdey	MI Windows and Doors, Inc.
Aaron M. Shultz	Architectural Testing, Inc.

4.0 Test Specification:

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: 1.9 m ² (20.0 ft ²)	Width		Height	
	millimeters	inches	millimeters	inches
Overall size	1016	40	1829	72
Interior sash	927	36-1/2	876	34-1/2
Exterior sash	908	35-3/4	851	33-1/2
Screen	921	36-1/4	914	36

5.2 Frame Construction:

Frame Member	Material	Description
Head, sill, jambs	PVC	Extruded

	Joinery Type	Detail
All corners	Mitered	Thermally welded

5.3 Sash Construction:

Sash Member	Species/Material/ Alloy	Other
Rails, stiles	PVC	Extruded

5.0 Test Specimen Description: (Continued)

5.3 Sash Construction: (Continued)

	Joinery Type	Detail
All corners	Mitered	Thermally welded

5.4 Weatherstripping:

Description	Quantity	Location
0.187" backed by 0.240" high polypile with center fin	1 Row	Vertical sill leg, head, exterior sash top rail, interior meeting rail
0.187" backed by 0.240" high polypile with center fin	2 Rows	All sash stiles
0.187" backed by 0.160" high polypile with center fin	1 Row	Exterior meeting rail
7/8" by 1/2" by 0.400" high polypile pad	2	Each end of interior meeting rail
0.187" backed custom dual leaf vinyl bulb seal	2 Rows	Interior sash bottom rail

5.5 Glazing:

Glass Type	Spacer Type	Interior Lite	Exterior Lite	Glazing Method
3/4" IG	Metal reinforced butyl spacer	3/32" annealed	3/32" annealed	The window was exterior glazed onto double-sided adhesive tape and secured with a PVC snap-in glazing bead

Location	Quantity	Daylight Opening	Glass Bite
Interior sash	1	33" by 31"	1/2"
Exterior sash	1	33" by 31-5/8"	1/2"

5.6 Drainage: A sloped sill was utilized.

Drainage Method	Size	Quantity	Location
Weepslot	1/2" long by 3/32" wide	4	2-1/2" from edge of each sash
Weepslot	1/2" long by 1/16" wide	2	2-1/2" from edge of interior sash bottom rail

5.0 Test Specimen Description: (Continued)

5.7 Hardware:

Description	Quantity	Location
Plastic tilt latches (recessed)	4	Ends of top rail and interior meeting rail
Constant force balance	4	Two per jamb
Metal tilt pins	4	Ends of bottom rail and exterior meeting rail
Metal locks with adjacent keepers	2	7" from ends of interior meeting rail

5.8 Reinforcement:

Drawing Number	Location	Material
M-1911	Exterior meeting rail	Heavy duty aluminum
RF-104S-020	Interior meeting rail	Roll-formed steel
GVL-450	Bottom rail of interior sash	Roll-formed steel

5.9 Screen Construction:

Frame Material	Corner Construction	Mesh Attachment Method
Extruded aluminum	Mitered and keyed with a plastic key	Fiberglass mesh was secured with a flexible vinyl spline

6.0 Installation:

The specimen was installed into a Spruce-Pine-Fir wood buck. The rough opening allowed for a 1/4" shim space. The exterior perimeter of the window was sealed with silicone.

Location	Anchor Description	Anchor Location
Jambs	#8 x 1-1/4" long pan head screws	3" from each end, into the wood buck

7.0 Test Results: The temperature during testing was 68.9°C (21°F). The results are tabulated as follows:

Title of Test	Results	Allowed	Note
Operating Force, per ASTM E 2068	Initiate motion: 51 N (10 lbf) Maintain motion: 91 N (18 lbf) Latches: 10 N (2 lbf) Locks: 25 N (5 lbf)	Report Only 135 N (30 lbf) 100 N (22.5 lbf) 100 N (22.5 lbf)	7
Air Leakage, per ASTM E 283 at 75 Pa (1.6 psf)	0.9 L/s/m ² (0.17 cfm/ft ²)	1.5 L/s/m ² (0.3 cfm/ft ²) max.	1, 7
Water Penetration, per ASTM E 547	N/A	N/A	3, 7
Uniform Load Deflection, per ASTM E 330	N/A	N/A	3, 7
Uniform Load Structural, per ASTM E 330	N/A	N/A	3, 7
Forced Entry Resistance, per ASTM F 588 Type: A - Grade: 10	No entry	No entry	7
Thermoplastic Corner Weld	Meets as stated	Meets as stated	7
Deglazing, Operating direction, 320 N (70 lbf) Remaining direction, 230 N (50 lbf)	Pass Pass	Pass Pass	7

7.0 Test Results: (Continued)

Title of Test	Results	Allowed	Note
Optional Performance			
Water Penetration, per ASTM E 547 at 260 Pa (5.43 psf)	No leakage	No leakage	2, 7
Uniform Load Deflection, per ASTM E 330 taken at meeting rail +1680 Pa (+35.30 psf) -2400 Pa (-50.13 psf)	9.7 mm (0.38") 16.8 mm (0.66")	Report Only Report Only	4, 5, 6
Uniform Load Structural, per ASTM E 330 taken at meeting rail +2520 Pa (+52.95 psf) -3600 Pa (-75.19 psf)	2.3 mm (0.09") 0.3 mm (0.01")	3.6 mm (0.14") max. 3.6 mm (0.14") 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: With and without insect screen.

Note 3: The client opted to start at a pressure higher than the minimum required.

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, Inc. Report No. 96724.01-109-47, dated 12/22/09 for test results.

The service life of this report will expire on the stated Test Record Retention End Date, at which time such materials as drawings, data sheets, samples of test specimens, copies of this report, and any other pertinent project documentation, shall be discarded without notice.

If test specimen contains glazing, no conclusions of any kind regarding the adequacy or inadequacy of the glass in any glazed test specimen(s) 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.

Aaron M. Shultz
Technician

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

AMS:dem

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

Note: No alterations were required.



Test Report No.: A4372.01-109-44
Report Date: 11/04/10
Test Record Retention End Date: 10/06/14

Appendix B

Drawings

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