

**TEST REPORT**

**Report No.:** A4773.01-109-47

**Rendered to:**

MI WINDOWS AND DOORS, INC.  
Gratz, Pennsylvania

**PRODUCT TYPE:** PVC Double Hung Window (Integral Fin)  
**SERIES/MODEL:** 1650

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

<b>Title</b>	<b>Summary of Results</b>
Primary Product Designator	Class R-PG15 1219 x 2032 (48 x 80)-H
Design Pressure	±720 Pa (±15.04 psf)
Air Infiltration	0.8 L/s/m <sup>2</sup> (0.16 cfm/ft <sup>2</sup> )
Water Penetration Resistance Test Pressure	260 Pa (5.43 psf)

**Test Completion Date:** 11/19/2010

Reference must be made to Report No. A4773.01-109-47, dated 01/06/11 for complete test specimen description and detailed 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 Double Hung Window (Integral Fin)

**3.2 Series/Model:** 1650

**3.2.1** This product also labeled under the following names: 1555, BMDH3, and NCDH3.

**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 R-PG15 1219 x 2032 (48 x 80)-H** rating.

**3.4 Test Dates:** 11/1/2010 - 11/19/2010

**3.5 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".

**3.6 Test Sample Source:** The test specimen was 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 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.

**3.8 List of Official Observers:**

<u>Name</u>	<u>Company</u>
Rick Sawdey	MI Windows and Doors, Inc.
Jeremy R. Bender	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: 2.5 m <sup>2</sup> (26.7 ft <sup>2</sup> )	Width		Height	
	millimeters	inches	millimeters	inches
Overall size	1219	48	2032	80
Exterior sash	1114	43-7/8	905	35-5/8
Interior sash	1130	44-1/2	995	39-3/16
Screen	1121	44-1/8	1953	76-7/8

##### 5.2 Frame Construction:

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

	Joinery Type	Detail
All corners	Mitered	Thermally welded

##### 5.3 Sash Construction:

Sash Member	Species/Material/ Alloy	Other
Top rail, bottom rail, and stiles	PVC	Extruded

	Joinery Type	Detail
All corners	Mitered	Thermally welded

## 5.0 Test Specimen Description: (Continued)

### 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 0.160" high polypile with center fin	1 Row	Exterior meeting rail
0.187" backed by 0.240" high polypile with center fin	2 Rows	All sash stiles
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	3/32" clear annealed	3/32" clear annealed	The glass was exterior glazed onto double sided adhesive tape and secured with snap-in PVC glazing beads

Location	Quantity	Daylight Opening		Glass Bite
		millimeters	inches	
Exterior sash	1	1045 x 908	41-1/8 x 35-3/4	1/2"
Interior sash	1	1041 x 905	41 x 35-5/8	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 lock with adjacent keeper	2	7" from ends of meeting rail

### 5.8 Reinforcement:

Drawing Number	Location	Material
M-1911	Exterior meeting rail	Aluminum
RF-104S-020	Interior meeting rail	Roll-formed steel
GVL-450	Bottom rail	Roll-formed steel

### 5.9 Screen Construction:

Frame Material	Corner Construction	Mesh Type	Mesh Attachment Method
Extruded aluminum	Mitered and keyed with plastic key	Fiberglass	Flexible vinyl spline

## 6.0 Installation:

The specimen was installed into a Spruce-Pine-Fir wood buck. The rough opening allowed for a 1/16" shim space. The exterior perimeter of the window was sealed with sealant.

Location	Anchor Description	Anchor Location
Head, sill, and jambs	#6 x 1-5/8" long drywall screws	3" from corners and spaced 7" on center, through the mounting fin into the wood buck



**7.0 Test Results:** The temperature during testing was 19°C (67°F). The results are tabulated as follows:

Title of Test	Results	Allowed	Note
<b>Operating Force,</b> per ASTM E 2068	Initiate motion: 44 N (10 lbf) Maintain motion: 36 N (8 lbf) Latches 13 N (3 lbf) Locks: 13 N (3 lbf)	Report Only  135 N (30 lbf) max.  100 N (22.5 lbf) max.  100 N (22.5 lbf) max.	
<b>Air Leakage,</b> Infiltration per ASTM E 283 at 75 Pa (1.6 psf)	0.8/m <sup>2</sup> (0.16/ft <sup>2</sup> )	1.5 L/s/m <sup>2</sup> (0.3 cfm/ft <sup>2</sup> ) max.	1
<b>Water Penetration,</b> per ASTM E 547	N/A	N/A	3
<b>Uniform Load Deflection,</b> per ASTM E 330 taken at meeting rail +720 Pa (+15.04 psf) -720 Pa (-15.04 psf)	10.4 mm (0.41") 12.2 mm (0.48")	Report Only	4, 5, 6
<b>Uniform Load Structural,</b> per ASTM E 330 taken at meeting rail +1080 Pa (+22.56 psf) -1080 Pa (-22.56 psf)	0.8 mm (0.03") 1.8 mm (0.07")	4.3 mm (0.17") max. 4.3 mm (0.17") max.	5, 6
<b>Forced Entry Resistance,</b> per ASTM F 588, Type: A - Grade: 10	Pass	No entry	
<b>Thermoplastic Corner Weld</b>	Pass	Meets as stated	
<b>Deglazing,</b> per ASTM E 987 Operating direction, 320 N (70 lbf)	Pass	Meets as stated	
<b>Remaining direction,</b> 230 N (50 lbf)	Pass	Meets as stated	
<b>Optional Performance</b>			
<b>Water Penetration,</b> per ASTM E 547 at 260 Pa (5.43 psf)	Pass	No leakage	2

## 7.0 Test Results: (Continued)

*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. 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.*



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.

---

Jeremy R. Bender  
Technician

---

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

JRB: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

**Alteration #1:** Date - 11/02/10  
Cause for alteration - Failed water at 5.43 psf and structural loads at  
+30.08 psf (tilt latches disengaged)  
Remedial action taken - Replaced interior sash



**Architectural Testing**

Test Report No.: A4773.01-109-47  
Report Date: 01/06/11  
Test Record Retention End Date: 11/19/14

## **Appendix B**

### **Drawings**

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