



TEST REPORT

Report No.: G2284.01-109-47

Rendered to:

MI WINDOWS AND DOORS, LLC
Gratz, Pennsylvania

PRODUCT TYPE: Polyvinyl Chloride (PVC) Fixed Window
SERIES/MODEL: 1620/1630

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

Title	Summary of Results	
	Test Specimen #1	Test Specimen #2
AAMA/WDMA/CSA 101/I.S.2/A440-08	Class LC-PG55 1829 x 1829 (72 x 72)-FW	Class LC-PG40 2134 x 1219 (84 x 48)-FW
Design Pressure	±2640 Pa (±55.14 psf)	±1920 Pa (±40.10 psf)
Air Infiltration	0.1 L/s/m ² (0.01 cfm/ft ²)	0.4 L/s/m ² (0.07 cfm/ft ²)
Water Penetration Resistance Test Pressure	580 Pa (12.11 psf)	580 Pa (12.11 psf)

Test Completion Date: 08/26/16

Reference must be made to Report No. G2284.01-109-47, dated 10/20/16 for complete test specimen description and detailed test results.

1.0 Report Issued To: MI Windows and Doors, LLC
650 West Market Street
Gratz, Pennsylvania 17030-0370

2.0 Test Laboratory: Architectural Testing, Inc., an Intertek company ("Intertek-ATI")
130 Derry Court
York, Pennsylvania 17406-8405
717-764-7700

3.0 Project Summary:

3.1 Product Type: Polyvinyl Chloride (PVC) Fixed Window

3.2 Series/Model: 1620/1630

3.3 Compliance Statement: Results obtained are tested values and were secured by using the designated test method(s). The specimens tested successfully met the performance requirements for the following ratings:

Test Specimen(s)	Title	Summary of Results
1	101/I.S.2/A440-08	Class LC-PG55 1829 x 1829 (72 x 72)-FW
2	101/I.S.2/A440-08	Class LC-PG40 2134 x 1219 (84 x 48)-FW

3.4 Test Dates: 08/25/16 - 08/26/16

3.5 Test Record Retention End Date: All test records for this report will be retained until August 26, 2020.

3.6 Test Location: MI Windows and Doors, LLC test facility in Gratz, Pennsylvania. Calibration of test equipment was performed by Intertek-ATI in accordance with AAMA 205-15 "In-Plant Testing Guidelines for Manufacturers and Independent Laboratories".

3.7 Test Specimen Source: The test specimen(s) were provided by the client. Representative samples of the test specimen(s) will be retained by Intertek-ATI for a minimum of two years from the test completion date.

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

3.9 List of Official Observers:

<u>Name</u>	<u>Company</u>
Richie Williard	MI Windows and Doors, LLC
Andrew P. Mehalick	Intertek-ATI

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:

Test Specimen #1:

Overall Area: 3.3 m ² (36.0 ft ²)	Width		Height	
	millimeters	inches	millimeters	inches
Overall size	1829	72	1829	72

Test Specimen #2:

Overall Area: 2.6 m ² (28.0 ft ²)	Width		Height	
	millimeters	inches	millimeters	inches
Overall size	2134	84	1219	48

The following descriptions apply to all specimens.

5.2 Frame Construction:

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

	Joinery Type	Detail
All corners	Mitered	Thermally welded

5.0 Test Specimen Description: (Continued)

5.3 Weatherstripping: No weatherstripping was utilized.

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

Test Specimen #1:

Glass Type	Spacer Type	Interior Lite	Exterior Lite	Glazing Method
7/8" IG	Metal-reinforced butyl	3/16" thick annealed glass	3/16" thick annealed glass	Glazed from the exterior to the interior using silicone on the interior face of the glazing pocket. Glazing beads were used to secure the glass on the exterior of the test specimen.

Location	Quantity	Daylight Opening		Glass Bite
		millimeters	inches	
Fixed daylight opening	1	1708 x 1708	67-1/4 x 67-1/4	1/2"

Test Specimen #2:

Glass Type	Spacer Type	Interior Lite	Exterior Lite	Glazing Method
3/4" IG	Metal-reinforced butyl	1/8" thick annealed glass	1/8" thick annealed glass	Glazed from the exterior to the interior using silicone on the interior face of the glazing pocket. Glazing beads were used to secure the glass on the exterior of the test specimen.

Location	Quantity	Daylight Opening		Glass Bite
		millimeters	inches	
Fixed daylight opening	1	2019 x 1102	79-1/2 x 43-3/8	1/2"

5.5 Drainage: No drainage was utilized.

5.6 Hardware: No hardware was utilized.

5.7 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 1/16" shim space. The exterior perimeter of the window was sealed with silicone.

Test Specimen #1:

Location	Anchor Description	Anchor Location
Head, sill, and jambs	#8 x 2" pan head screws	Located 4" from each corner and spaced every 16" on center thereafter through the head, sill, and jambs and into the wood buck

Test Specimen #2:

Location	Anchor Description	Anchor Location
Head, sill, and jambs	#8 x 2" pan head screws	Located 4" from each corner and spaced every 19" on center thereafter through the head, sill, and jambs and into the wood buck

7.0 Test Results: The temperature during testing was 23°C (73°F). The results are tabulated as follows:

Test Specimen #1:

Title of Test	Results	Allowed	Note
Air Leakage, Infiltration per ASTM E 283 at 75 Pa (1.57 psf)	0.1 L/s/m ² (0.01 cfm/ft ²)	1.5 L/s/m ² (0.3 cfm/ft ²) max.	1
Water Penetration, per ASTM E 547	N/A	N/A	2
Uniform Load Deflection, per ASTM E 330	N/A	N/A	2
Uniform Load Structural, per ASTM E 330	N/A	N/A	2
Forced Entry Resistance, per ASTM F 588 Type: D - Grade: 10	Pass	No entry	
Thermoplastic Corner Weld	Pass	Meets as stated	
Deglazing, per ASTM E 987 Operating direction, 320 N (70 lbf) Remaining direction, 230 N (50 lbf)	Pass Pass	Meets as stated Meets as stated	
Optional Performance			
Water Penetration, per ASTM E 547 at 580 Pa (12.11 psf)	Pass	No leakage	
Uniform Load Deflection, per ASTM E 330 Deflections taken along the sill +2640 Pa (+55.14 psf) -2640 Pa (-55.14 psf)	0.8 mm (0.03") 3.3 mm (0.13")	Report only	3, 4, 5
Uniform Load Structural, per ASTM E 330 Permanent sets taken along the sill +3960 Pa (+82.71 psf) -3960 Pa (-82.71 psf)	0.3 mm (0.01") 1.3 mm (0.05")	6.8 mm (0.27") max. 6.8 mm (0.27") max.	4, 5

7.0 Test Results: (Continued)

Test Specimen #2:

Title of Test	Results	Allowed	Note
Air Leakage, Infiltration per ASTM E 283 at 75 Pa (1.57 psf)	0.4 L/s/m ² (0.07 cfm/ft ²)	1.5 L/s/m ² (0.3 cfm/ft ²) max.	1
Water Penetration, per ASTM E 547	N/A	N/A	2
Uniform Load Deflection, per ASTM E 330	N/A	N/A	2
Uniform Load Structural, per ASTM E 330	N/A	N/A	2
Forced Entry Resistance, per ASTM F 588, Type: D - Grade: 10	Pass	No entry	
Thermoplastic Corner Weld	Pass	Meets as stated	
Deglazing, per ASTM E 987 Operating direction, 320 N (70 lbf) Remaining direction, 230 N (50 lbf)	Pass Pass	Meets as stated Meets as stated	
Optional Performance			
Water Penetration, per ASTM E 547 at 580 Pa (12.11 psf)	Pass	No leakage	
Uniform Load Deflection, per ASTM E 330 Deflections taken along the sill +1920 Pa (+40.10 psf) -1920 Pa (-40.10 psf)	0.3 mm (0.01") 0.8 mm (0.03")	Report only	3, 4, 5
Uniform Load Structural, per ASTM E 330 Permanent sets taken along the sill +2880 Pa (+60.15 psf) -2880 Pa (-60.15 psf)	<0.3 mm (<0.01") 0.5 mm (0.02")	8.1 mm (0.32") max. 8.1 mm (0.32") max.	4, 5

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

Note 3: 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 4: Loads were held for 10 seconds.

Note 5: Tape and film were not used to seal against air leakage during structural testing.

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

For ARCHITECTURAL TESTING, Inc.

Andrew P. Mehalick
Technician

Timothy J. McGill
Manager – Product Testing

APM:asm/jc

Attachments (pages): This report is complete only when all attachments listed are included.

Appendix-A: Alteration Addendum (1)

Appendix-B: Location of Air Seal (1)

Appendix-C: Drawing(s) Complete drawings packet on file with Intertek-ATI.

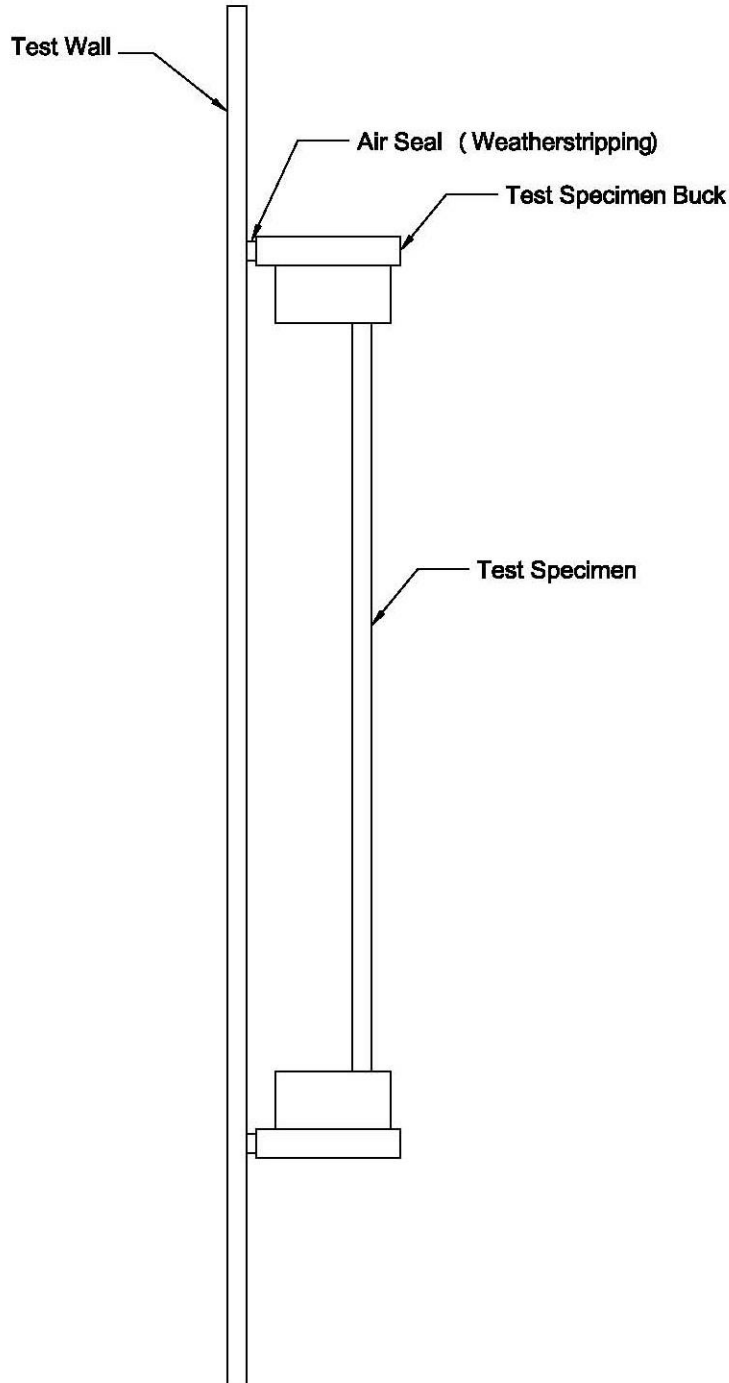
Appendix A

Alteration Addendum

Note: *No alterations were required.*

Appendix B

Location of Air Seal: The air seal between the test specimen and the test wall is detailed below. The seal is made of foam weatherstripping and is attached to the edge of the test specimen buck. The test specimen buck is placed against the test wall and clamped in place, compressing the weatherstripping and creating a seal.



Appendix D

Drawing(s)

Note: Complete drawings packet on file with Intertek-ATI.