



TEST REPORT

Report No.: E9326.01-109-47

Rendered to:

MI WINDOWS AND DOORS, LLC
Gratz, Pennsylvania

PRODUCT TYPE: Polyvinyl Chloride (PVC) Single Hung Window
SERIES/MODEL: 4300

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
AAMA/WDMA/CSA 101/I.S.2/A440-08	Class R-PG20 1219 x 1981 (48 x 78)-H
Positive Design Pressure	+960 Pa (+20.05 psf)
Negative Design Pressure	-1200 Pa (-25.06 psf)
Air Infiltration	0.9 L/s/m ² (0.18 cfm/ft ²)
Water Penetration Resistance Test Pressure	220 Pa (4.60 psf)

Test Completion Date: 07/29/15

Reference must be made to Report No. E9326.01-109-47, dated 01/21/16 for complete test specimen description and detailed test results.

- 1.0 Report Issued To:** MI Windows and Doors, LLC
650 West Market Street
P.O. Box 370
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) Single Hung Window
- 3.2 Series/Model:** 4300
- 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-PG20 1219 x 1981 (48 x 78)-H** rating.
- 3.4 Test Dates:** 07/07/15 - 07/29/15
- 3.5 Test Record Retention End Date:** All test records for this report will be retained until July 29, 2019.
- 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 205-01 "In-Plant Testing Guidelines for Manufacturers and Independent Laboratories".
- 3.7 Test Specimen Source:** The test specimen(s) was provided by the client. Representative samples of the test specimen(s) will be retained by Intertek-ATI for a minimum of four 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>
Rick Sawdey	MI Windows and Doors, LLC
Jeremy R. Bender	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:

Overall Area: 2.4 m ² (26.0 ft ²)	Width		Height	
	millimeters	inches	millimeters	inches
Overall size	1219	48	1981	78
Interior sash	1153	45-3/8	1054	41-1/2
Screen	1133	44-5/8	1029	40-1/2

5.2 Frame Construction:

Frame Member	Material	Description
Head, sill, and jambs	PVC	Extruded
Fixed meeting rail	PVC	Extruded

	Joinery Type	Detail
All corners	Mitered	Thermally welded
Fixed meeting rail	Coped and butted	Secured at each end with a PVC end cap. End cap was secured to the meeting rail with three #6 x 1-1/4" long flathead screws and to the jamb with three #6 x 5/8" long flathead screws

5.3 Sash Construction:

Sash Member	Material	Description
Rails 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 0.150" high polypile with center fin	1	Sill leg
0.187" backed by 0.290" high polypile with center fin	1	Sash stiles
0.187" backed by 0.230" high polypile with center fin	1	Sash stiles and interior meeting rail
0.187" backed by 5/16" diameter foam-filled vinyl bulb	1	Bottom rail
0.187" backed by 5/32" diameter foam-filled vinyl bulb	1	Fixed meeting rail

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	3/32" annealed	3/32" annealed	Interior glazed against a bead of silicone and secured with snap-in vinyl glazing beads. Top glass was interior glazed against a double-sided foam tape and secured with snap-in vinyl glazing beads.

Location	Quantity	Daylight Opening		Glass Bite
		millimeters	inches	
Sash daylight opening	1	1076 x 981	42-3/8 x 38-5/8	1/2"
Fixed daylight opening	1	1099 x 826	43-1/4 x 32-1/2	1/2"

5.6 Drainage:

Drainage Method	Size	Quantity	Location
Weep notch	1" wide by 1/4" high	2	Each end of the sill and on each side of the intermediate frame jambs
Weep notch	1" wide by 1/8" high	2	Each end of the sill and on each side of the intermediate frame jambs
Weephole	1/2" wide by 1/8" high	2	Two at each end of the sash bottom rail, 2-1/2" from each end
Weephole	1/2" wide by 1/4" high	2	Each end of the interior wall of the sash bottom rail, 2" from each end

5.0 Test Specimen Description: (Continued)

5.7 Hardware:

Description	Quantity	Location
Composite lock with adjacent keeper	2	6-1/2" from each end at the meeting rail with adjacent keeper on the fixed meeting rail
Plastic tilt latches	2	Each end of the interior meeting rails
Constant force balances	2	One at each jamb
Metal tilt pin	2	Each end of the bottom rail

5.8 Reinforcement:

Drawing Number	Location	Material
GVL-451-020	Interior meeting rail	Steel
GVL-450	Fixed meeting rail	Steel

5.9 Screen Construction:

Frame Material	Corner Construction	Mesh Type	Mesh Attachment Method
Roll-formed aluminum	Square-cut with inside key corners	Fiberglass	Flexible vinyl spline

6.0 Installation:

The specimen was installed into a Spruce-Pine-Fir wood buck. The rough opening allowed for a 1/8" 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 screw	2" from each corner and spaced 10" on center, through the mounting fin into the wood buck

7.0 Test Results: The temperature during testing was 22°C (71°F). The results are tabulated as follows:

Title of Test	Results	Allowed	Note
Operating Force, per ASTM E 2068	Initiate motion: 71 N (16 lbf) Maintain motion: 62 N (14 lbf) Latches: 9 N (2 lbf) Locks: 18 N (4 lbf)	Report only 155 N (35 lbf) max. 100 N (22.5 lbf) max. 100 N (22.5 lbf) max.	
Air Leakage, Infiltration per ASTM E 283 at 75 Pa (1.57 psf)	0.9 L/s/m ² (0.18 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	3
Uniform Load Deflection, per ASTM E 330 Deflections taken at meeting rail +720 Pa (+15.04 psf) -720 Pa (-15.04 psf)	7.6 mm (0.30") 7.4 mm (0.29")	Report only	4, 5, 6
Uniform Load Structural, per ASTM E 330 Permanent sets taken at meeting rail +1080 Pa (+22.56 psf) -1080 Pa (-22.56 psf)	0.3 mm (0.01") 0.8 mm (0.03")	4.3 mm (0.17") max. 4.3 mm (0.17") max.	5, 6
Forced Entry Resistance, per ASTM F 588, Type: A - Grade: 10	Pass	No entry	
Thermoplastic Corner Weld	Pass	Meets as stated	

7.0 Test Results: (Continued)

Title of Test	Results	Allowed	Note
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 220 Pa (4.60 psf)	Pass	No leakage	2
Uniform Load Deflection, per ASTM E 330 Deflections taken at meeting rail +960 Pa (+20.05 psf) -1200 Pa (-25.06 psf)	10.9 mm (0.43") 11.4 mm (0.45")	Report only	4, 5, 6
Uniform Load Structural, per ASTM E 330 Permanent sets taken at meeting rail +1440 Pa (+30.08 psf) -1800 Pa (-37.59 psf)	0.8 mm (0.03") 1.3 mm (0.05")	4.3 mm (0.17") max. 4.3 mm (0.17") 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. 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.

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.

Jeremy R. Bender
Lead Technician

Timothy J. McGill
Manager - Product Testing

JRB:asm

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: Complete drawings packet on file with Intertek-ATI.



Test Report No.: E9326.01-109-47

Revision 1: 02/03/16

Report Date: 01/21/16

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Revision Log

<u>Rev. #</u>	<u>Date</u>	<u>Page(s)</u>	<u>Revision(s)</u>
1	02/03/16	Page 3	Corrected sash daylight opening height

This report produced from controlled document template ATI 00438, revised 06/27/14.

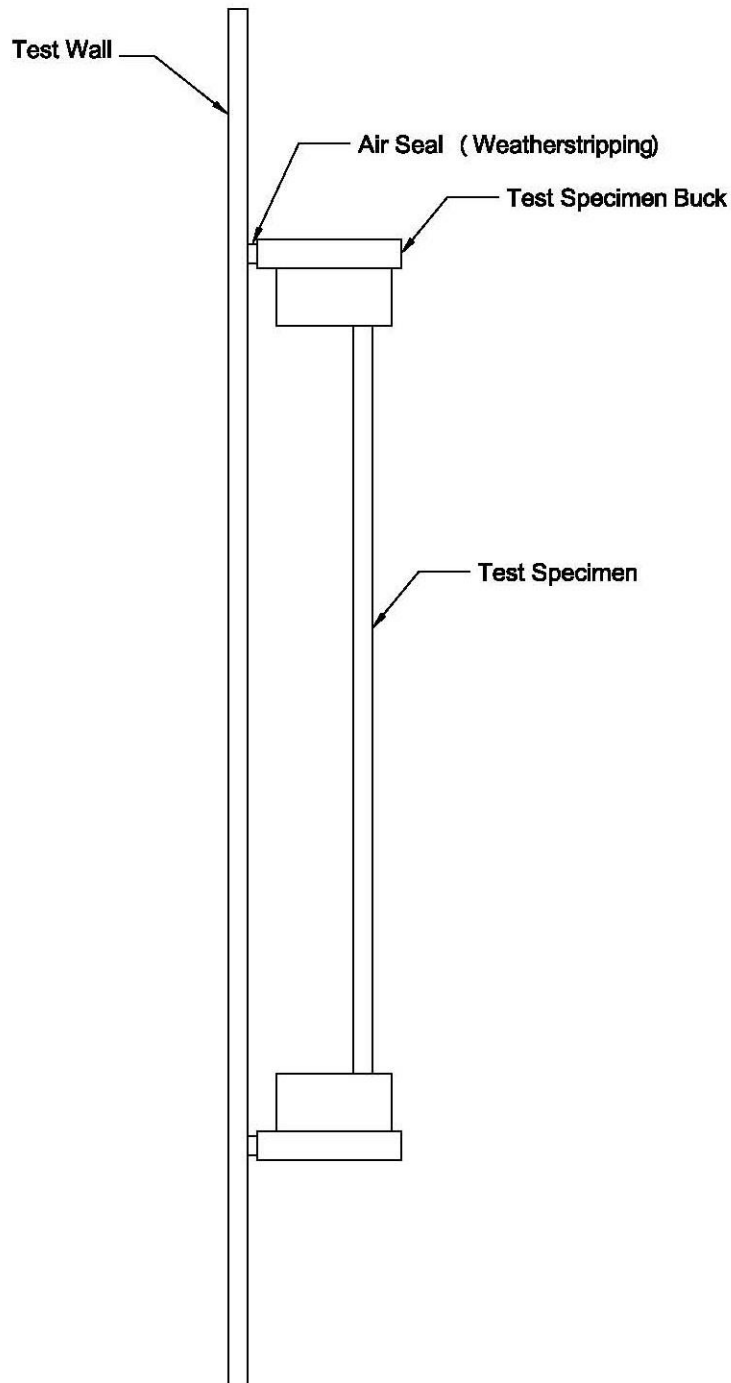
Appendix A

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 C

Drawing(s)

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