

TEST REPORT

Report No.: B7959.01-109-47

Rendered to:

MI WINDOWS AND DOORS, INC.
Gratz, Pennsylvania

PRODUCT TYPE: PVC Single Hung Window
SERIES/MODEL: 4300

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

Test Dates: 03/21/12
Through: 03/26/12
Report Date: 04/11/12

Summary of Results

Title	Test Specimen #1
Primary Product Designator	Class R-PG20 1219 x 1981 (48 x 78)-H
Design Pressure	+960 Pa (+20.05 psf)
Negative Design Pressure	-1200 Pa (-25.06 psf)
Air Infiltration	1.2 L/s/m ² (0.23 cfm/ft ²)
Water Penetration Resistance Test Pressure	260 Pa (5.43 psf)

Summary of Results		
Title	Test Specimen #2	Test Specimen #3
Primary Product Designator	Class R-PG30 914 x 1880* (36 x 74*)-H	Class R-PG35 914 x 1524* (36 x 60*)-H
Design Pressure	+1440 Pa (+30.08 psf)	+2160 Pa (+45.11 psf)
Negative Design Pressure	-2260 Pa (-47.20 psf)	-2640 Pa (-55.14 psf)
Air Infiltration	N/A	N/A
Water Penetration Resistance Test Pressure	N/A	N/A

Test Completion Date: 03/26/2012

Reference must be made to Report No. B7959.01-109-47, dated 04/11/12 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 Single Hung Window

3.2 Series/Model: 4300

3.2.1 This product also labeled under the following names: 4300SPSH, 4340SH, 4340SPSH, S-4300SH, S-4300SPSH, S-4340SH, S-4340SPSH, W-4300SH, W-4300SPSH, NBSH, NBSPSH, and 1355.

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 #1: **Class R-PG20 1219 x 1981 (48 x 78)-H**; Test Specimen #2: **Class R-PG30 914 x 1880* (36 x 74*)-H**, Test Specimen #3: **Class R-PG35 914 x 1524* (36 x 60*)-H**.

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 Dates: 03/21/2012 - 03/26/2012

3.5 Test Record Retention End Date: All test records for this report will be retained until April 11, 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 AAMA 205-01 "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 test 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.

3.0 Project Summary:

3.9 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:

Test Specimen #1:

Overall Area: 2.4 m ² (26 ft ²)	Width		Height	
	millimeters	inches	millimeters	inches
Overall size	1219	48	1981	78
Interior sash	1153	45-3/8	978	38-1/2
Screen	1130	44-1/2	951	37-7/16

Test Specimen #2:

Overall Area: 1.7 m ² (18.5 ft ²)	Width		Height	
	millimeters	inches	millimeters	inches
Overall size	914	36	1880	74
Interior sash	846	33-5/16	926	36-7/16

Test Specimen #3:

Overall Area: 1.4 m ² (15.0 ft ²)	Width		Height	
	millimeters	inches	millimeters	inches
Overall size	914	36	1524	60
Interior sash	846	33-5/16	749	29-1/2

**5.0 Test Specimen Description:** (Continued)

The following descriptions apply to all specimens.

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 flat head screws and to the jamb with three #6 x 5/8" long flat head screws

5.3 Sash Construction:

Sash 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 0.150" 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

**5.0 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	3/32" clear annealed	3/32" clear annealed	The fixed lite was interior glazed onto double-sided adhesive tape and secured with snap-in PVC glazing beads. The sash was interior glazed onto a bead of silicone and secured with snap-in PVC glazing beads.

Test Specimen #1:

Location	Quantity	Daylight Opening		Glass Bite
		millimeters	inches	
Sash daylight opening	1	1076 x 905	42-3/8 x 35-5/8	1/2"
Fixed daylight opening	1	1099 x 905	43-1/4 x 35-5/8	1/2"

Test Specimen #2:

Location	Quantity	Daylight Opening		Glass Bite
		millimeters	inches	
Sash daylight opening	1	772 x 854	30-3/8 x 33-5/8	1/2"
Fixed daylight opening	1	797 x 854	31-3/8 x 33-5/8	1/2"

Test Specimen #3:

Location	Quantity	Daylight Opening		Glass Bite
		millimeters	inches	
Sash daylight opening	1	772 x 676	30-3/8 x 26-5/8	1/2"
Fixed daylight opening	1	797 x 676	31-3/8 x 26-5/8	1/2"

**5.0 Test Specimen Description:** (Continued)

5.6 Drainage: A sloped sill was utilized.

5.7 Hardware:

Description	Quantity	Location
Metal cam lock with adjacent keepers	2	Interior meeting rail, 7" from each end
Block and tackle balance	2	One in each jamb
Plastic tilt latch	2	Each end of the interior meeting rail
Metal tilt pins	2	Each end of bottom rail

5.8 Reinforcement:

Drawing Number	Location	Material
GVL-451-020	Interior meeting rail and sash bottom 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 and keyed	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	2" from corners and spaced 8" on center through the mounting fin into the wood buck



7.0 Test Results: The temperature during testing was 21°C (70°F). The results are tabulated as follows:

Test Specimen #1:

Title of Test	Results	Allowed	Note
Operating Force, per ASTM E 2068	Initiate motion: 80 N (18 lbf) Maintain motion: 76 N (17 lbf) Latches: 9 N (2 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.	
Air Leakage, Infiltration per ASTM E 283 at 75 Pa (1.57 psf)	1.2 L/s/m ² (0.23 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	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	
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	

**7.0 Test Results:** (Continued)**Test Specimen #1:** (Continued)

Title of Test	Results	Allowed	Note
Optional Performance			
Water Penetration, per ASTM E 547 at 260 Pa (5.43 psf)	Pass	No leakage	2
Uniform Load Deflection, per ASTM E 330 taken at the meeting rail +960 Pa (+20.05 psf) -1200 Pa (-25.06 psf)	9.9 mm (0.39") 12.2 mm (0.48")	Report Only	4, 5, 6
Uniform Load Structural, per ASTM E 330 taken at the meeting rail +1440 Pa (+30.08 psf) -1800 Pa (-37.59 psf)	2.0 mm (0.08") 1.5 mm (0.06")	4.3 mm (0.17") max. 4.3 mm (0.17") max.	5, 6

Test Specimen #2:

Title of Test	Results	Allowed	Note
Optional Performance			
Uniform Load Deflection, per ASTM E 330 taken at the meeting rail +1440 Pa (+30.08 psf) -2260 Pa (-47.20 psf)	4.6 mm (0.18") 4.8 mm (0.19")	Report Only	4, 5, 6
Uniform Load Structural, per ASTM E 330 taken at the meeting rail +2160 Pa (+45.11 psf) -3390 Pa (-70.80 psf)	0.5 mm (0.02") 0.5 mm (0.02")	3.0 mm (0.12") max. 3.0 mm (0.12") max.	5, 6



7.0 Test Results: (Continued)

Test Specimen #3:

Title of Test	Results	Allowed	Note
Optional Performance			
Uniform Load Deflection, per ASTM E 330 taken at the meeting rail +2160 Pa (+45.11 psf) -2640 Pa (-55.14 psf)	6.1 mm (0.24") 7.4 mm (0.29")	Report Only	4, 5, 6
Uniform Load Structural, per ASTM E 330 taken at the meeting rail +3240 Pa (+67.67 psf) -3960 Pa (-82.71 psf)	0.8 mm (0.03") 0.3 mm (0.01")	3.0 mm (0.12") max. 3.0 mm (0.12") 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.



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.

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.



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Appendix A

Alteration Addendum

Note: No alterations were required.



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Appendix B

Drawings

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