



TEST REPORT

Report No.: E5565.01-109-47

Rendered to:

MI WINDOWS AND DOORS, LLC
Gratz, Pennsylvania

PRODUCT TYPE: Aluminum Single Hung Window
SERIES/MODEL: GA275

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 R-PG30 1219 x 2134 (48 x 84)-H	Class R-PG40 1219 x 1829* (48 x 72*)-H
Design Pressure	+1440 Pa (+30.08 psf)	+1920 Pa (+40.10 psf)
Negative Design Pressure	-1680 Pa (-35.09 psf)	-1920 Pa (-40.10 psf)
Air Infiltration	0.8 L/s/m ² (0.15 cfm/ft ²)	N/A
Water Penetration Resistance Test Pressure	290 Pa (6.06 psf)	N/A

Test Completion Date: 02/25/15

Reference must be made to Report No. E5565.01-109-47, dated 03/20/15 for complete test specimen description and detailed test results.

1.0 Report Issued To: MI Windows and Doors, LLC
P.O. Box 370
650 West Market Street
Gratz, Pennsylvania 17030-0370

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

3.0 Project Summary:

3.1 Product Type: Aluminum Single Hung Window

3.2 Series/Model: GA275

3.2.1 This product also labeled under the following names: GA275SPSH, GA275MULL, and 2700

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 R-PG30 1219 x 2134 (48 x 84)-H
2	101/I.S.2/A440-08	Class R-PG40 1219 x 1829* (48 x 72*)-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: 02/23/15 - 02/25/15

3.5 Test Record Retention End Date: All test records for this report will be retained until February 25, 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) were 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.

3.0 Project Summary: (Continued)

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:

Test Specimen #1:

Overall Area: 2.6 m ² (28.0 ft ²)	Width		Height	
	millimeters	Inches	millimeters	inches
Overall size	1219	48	2134	84
Interior sash	1165	45-7/8	1073	42-1/4
Screen	1057	41-5/8	987	38-7/8

Test Specimen #2:

Overall Area: 2.2 m ² (24.0 ft ²)	Width		Height	
	millimeters	Inches	millimeters	inches
Overall size	1219	48	1829	72
Interior sash	1162	45-3/4	927	36-1/2
Screen	1130	44-1/2	914	36

The following descriptions apply to all specimens.

5.0 Test Specimen Description: (Continued)

5.2 Frame Construction:

Frame	Material	Description
Head, sill, and jambs	Aluminum	Poured and debridged, thermally improved, extruded aluminum
Fixed meeting rail	Aluminum	Poured and debridged, thermally improved, extruded aluminum

	Joinery Type	Detail
All corners	Coped and butted	Sealed with sealant and secured with two #6 x 3/4" hex head screws per corner
Fixed meeting rail	Coped and butted	Sealed with sealant and secured to the frame jambs with two #6 x 3/4" hex head screws at each end

5.3 Sash Construction:

Sash Member	Material	Description
Rails and stiles	Aluminum	Poured and debridged, thermally improved, extruded aluminum

	Joinery Type	Detail
Top rail/stile corners	Coped and butted	Secured with two #6 x 7/8" pan head screws per corner
Bottom rail/stile corners	Coped and butted	Secured with one #6 x 7/8" pan head screw per corner

5.4 Weatherstripping:

Description	Quantity	Location
Kerf-mounted, 0.25" diameter, hollow vinyl bulb seal	1 Row	Sash bottom rail
0.270" backed by 0.380" high polypile with center fin	1 Row	Sash stiles
0.187" backed by 0.190" high polypile with center fin	1 Row	Sash stiles
0.187" backed by 0.200" high polypile with center fin	1 Row	Interior meeting rail
0.187" backed by 0.270" high polypile with center fin	1 Row	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.*

Test Specimen #1:

Glass Type	Spacer Type	Interior Lite	Exterior Lite	Glazing Method
11/16" IG	Metal reinforced butyl	1/8" clear annealed	1/8" clear annealed	Interior glazed against a bead of silicone and secured with PVC snap-in glazing beads

Location	Quantity	Daylight Opening		Glass Bite
		millimeters	inches	
Sash daylight opening	1	1118 x 987	44 x 38-7/8	1/2"
Fixed daylight opening	1	1118 x 1003	44 x 39-1/2	1/2"

Test Specimen #2:

Glass Type	Spacer Type	Interior Lite	Exterior Lite	Glazing Method
11/16" IG	Metal reinforced butyl	3/32" clear annealed	3/32" clear annealed	Interior glazed against a bead of silicone and secured with PVC snap-in glazing beads

Location	Quantity	Daylight Opening		Glass Bite
		millimeters	inches	
Sash daylight opening	1	1111 x 838	43-3/4 x 33	1/2"
Fixed daylight opening	1	1118 x 838	44 x 33	1/2"

5.6 Drainage: A sloped sill was utilized.

Drainage Method	Size	Quantity	Location
Weepnotch	1/2" wide by 1/4" high	2	Sill ends

5.0 Test Specimen Description: (Continued)

5.7 Hardware:

Description	Quantity	Location
Metal sweep lock	2	8" from the meeting rail ends
Spiral balance	2	One per frame jamb
Pivot bar	2	Bottom rail ends of interior sash (one side is retractable)
Tilt latch	2	Top rail ends of interior sash

5.8 Reinforcement: No reinforcement was utilized.

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 1/8" 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	3" from the corners and spaced 12" 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
<p>Operating Force, per ASTM E 2068</p>	<p>Initiate motion: 120 N (27 lbf) Maintain motion: 89 N (20 lbf) Latches: 9 N (2 lbf) Locks: 27 N (6 lbf)</p>	<p>Report Only 156 N (35 lbf) max. 100 N (22.5 lbf) max. 100 N (22.5 lbf) max.</p>	
<p>Air Leakage, Infiltration per ASTM E 283 at 75 Pa (1.57 psf)</p>	<p>0.8 L/s/m² (0.15 cfm/ft²)</p>	<p>1.5 L/s/m² (0.3 cfm/ft²) max.</p>	<p>1</p>
<p>Water Penetration, per ASTM E 547</p>	<p>N/A</p>	<p>N/A</p>	<p>3</p>
<p>Uniform Load Deflection, per ASTM E 330</p>	<p>N/A</p>	<p>N/A</p>	<p>3</p>
<p>Uniform Load Structural, per ASTM E 330</p>	<p>N/A</p>	<p>N/A</p>	<p>3</p>
<p>Forced Entry Resistance, per ASTM F 588, Type: A - Grade: 10</p>	<p>Pass</p>	<p>No entry</p>	
<p>Deglazing, per ASTM E 987 Operating direction, 320 N (70 lbf) Remaining direction, 230 N (50 lbf)</p>	<p>Pass Pass</p>	<p>Meets as stated Meets as stated</p>	

7.0 Test Results: (Continued)

Test Specimen #1: (Continued)

Title of Test	Results	Allowed	Note
Optional Performance			
Water Penetration, per ASTM E 547 at 290 Pa (6.06 psf)	Pass	No leakage	2
Uniform Load Deflection, per ASTM E 330 Deflections taken at meeting rail +1440 Pa (+30.08 psf) -1680 Pa (-35.09 psf)	4.8 mm (0.19") 5.6 mm (0.22")	Report Only	4, 5, 6
Uniform Load Structural, per ASTM E 330 Permanent sets taken at meeting rail +3600 Pa (+45.11 psf) -2520 Pa (-52.63 psf)	<0.3 mm (<0.01") 0.3 mm (0.01")	4.5 mm (0.18") max. 4.5 mm (0.18") max.	5, 6

Test Specimen #2:

Title of Test	Results	Allowed	Note
Uniform Load Deflection, per ASTM E 330	N/A	N/A	3
Uniform Load Structural, per ASTM E 330	N/A	N/A	3
Optional Performance			
Uniform Load Deflection, per ASTM E 330 Deflections taken at meeting rail +1920 Pa (+40.10 psf) -1920 Pa (-40.10 psf)	6.6 mm (0.26") 5.3 mm (0.21")	Report Only	4, 5, 6
Uniform Load Structural, per ASTM E 330 Permanent sets taken at meeting rail +2880 Pa (+60.15 psf) -2880 Pa (-60.15 psf)	0.3 mm (0.01") <0.3 mm (<0.01")	4.5 mm (0.18") max. 4.5 mm (0.18") max.	5, 6

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.

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 INTERTEK-ATI

Jeremy R. Bender
Senior Technician

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

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)

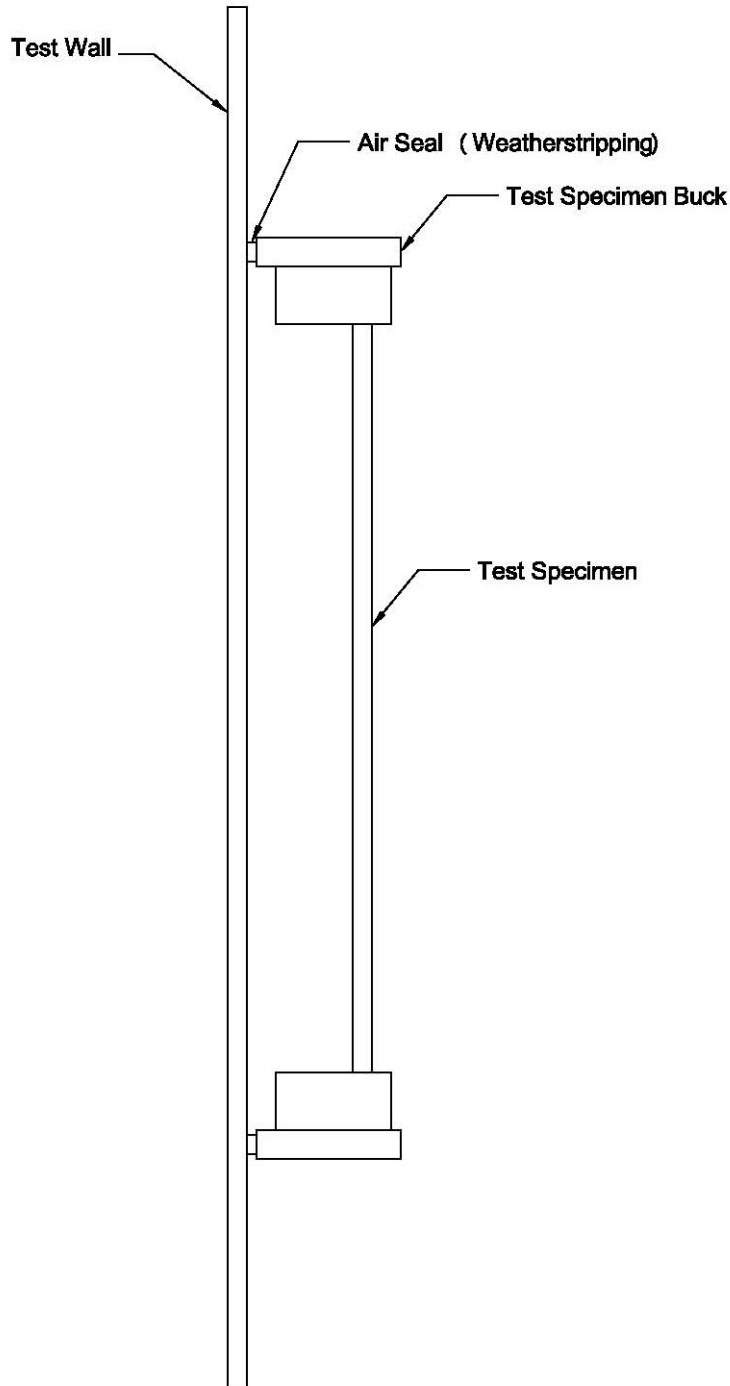
Appendix-C: Complete drawings packet on file with Intertek-ATI.

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.*