



TEST REPORT

Report No.: G7944.01-109-47

Rendered to:

MI WINDOWS AND DOORS, LLC
Gratz, Pennsylvania

PRODUCT TYPE: Polyvinyl Chloride (PVC) Sliding Glass Door
SERIES/MODEL: 1615/1617

SPECIFICATION(S): AAMA/WDMA/CSA 101/I.S.2/A440-11, *NAFS 2011 - North American Fenestration Standard/Specification for Windows, Doors, and Skylights*

Title	Summary of Results
AAMA/WDMA/CSA 101/I.S.2/A440-11	Class R-PG20 4737 x 2019 (187 x 80)-SD
Design Pressure	+1200 Pa (+25.06 psf)
Negative Design Pressure	-960 Pa (-20.05 psf)
Air Infiltration	0.6 L/s/m ² (0.12 cfm/ft ²)
Water Penetration Resistance Test Pressure	290 Pa (6.06 psf)

Test Completion Date: 03/09/17

Reference must be made to Report No. G7944.01-109-47, dated 05/11/17 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) Sliding Glass Door
- 3.2 Series/Model:** 1615/1617
- 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 4737 x 2019 (187 x 80)-SD** rating.
- 3.4 Test Date(s):** 02/13/17 - 03/09/17
- 3.5 Test Record Retention End Date:** All test records for this report will be retained until March 9, 2021.
- 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) 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>
Richie Williard	MI Windows and Doors, LLC
Joel T. Chronister	Intertek-ATI

4.0 Test Specification(s):

AAMA/WDMA/CSA 101/I.S.2/A440-11, *NAFS 2011 - North American Fenestration Standard/Specification for Windows, Doors, and Skylights*

5.0 Test Specimen Description:

5.1 Product Sizes:

Overall Area: 9.6 m ² (103.0 ft ²)	Width		Height	
	millimeters	inches	millimeters	inches
Overall size	4737	186-1/2	2019	79-1/2
Left panel size	1207	47-1/2	1911	75-1/4
Right panel size	1232	48-1/2	1911	75-1/4
Left screen	1181	46-1/2"	1937	76-1/4
Right screen	1203	47-3/8"	1937	76-1/4"

5.2 Frame Construction:

Frame Member	Material	Description
Head, sill, and jambs	PVC	Extruded
Outside sill cladding, sliding panel rail, sill extender	Aluminum	Extruded
Fixed sash support, fixed sash anchor block	PVC	Extruded

5.0 Test Specimen Description: (Continued)

5.2 Frame Construction: (Continued)

	Joinery Type	Detail
All corners	Coped and butted	Secured together using five #8 x 2" pan head screws through the jambs and into the head and sill. A custom-shaped foam pad was used at each corner to separate the frame members.
Outside sill cladding	Butted	Snap-fit onto the exterior face of the sill and secured using #8 x 5/8" pan head self-drilling screws and sealed using a bead of silicone
Sliding panel rail	Butted	Pressed into the sill
Sill extender	Butted	Secured using #6 x 5/8" self-tapping screws through the water bead on the sill extender and into the sill. A bead of silicone was placed between the sill extender and the sill.
Fixed sash support	Butted	Snap-fit into the sill
Fixed sash anchor block	Butted	Secured using two #8 x 2-3/4" flat head screws through the fixed sash anchor block, fixed sash support, and into the sill

5.3 Panel Construction:

Panel Member	Material	Description
Stiles, and rails	PVC	Extruded
Interlocks	PVC	Extruded
Mullion	PVC	Extruded

	Joinery Type	Detail
Stiles and rails	Mitered and welded	Thermally welded
Interlocks	Butted	Snap-fit into the meeting stiles and secured to the stiles using #8 x 5/8" pan head screws spaced 1-3/4" from the rails
Mullion	PVC	Secured to the keeper side stile using #8 x 1-3/4" pan head screws.

5.0 Test Specimen Description: (Continued)

5.4 Reinforcement:

Drawing Number	Location	Material
9895	Operable panel keeper stile	Steel
9599	Meeting stile of all panels	Steel
9882	Operable panel keeper stile	Wood

5.5 Weatherstripping:

Description	Quantity	Location
0.270" backed by 0.230" high woolpile with fin	2 rows	Rails
0.270" backed by 0.210" high woolpile with fin	1 row	Interlocks
0.270" backed by 0.210" high woolpile	2 rows	Mullion
0.187" backed by 3/8" hollow vinyl bulb	1 row	Mullion
Kerf-mounted, 5/16" hollow vinyl bulb	2 rows	Jambs
0.187" backed by 0.210" high woolpile	2 rows	Jambs
0.270" backed by 0.210 " high woolpile	2 rows	Jambs
0.270" wide by 1-3/4" long woolpile pad	3	Sill, at the exterior side of the fixed panel track
1-3/8" wide by 5" long by 1" high woolpile pad	3	Head, at the interior side of the fixed panel track
1-3/8" wide by 3-1/8" long by 1" high woolpile pad	3	Sill, at the interior side of the fixed panel track
0.270" backed by 0.460" high woolpile	1 row	Pull stile of the screen

5.0 Test Specimen Description: (Continued)

5.6 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
7/8" IG	Butyl-reinforced metal	1/8" tempered	1/8" tempered	Glazing was set from the exterior into a bead of silicone and secured in place using snap-in glazing beads.

Location	Quantity	Daylight Opening		Glass Bite
		millimeters	inches	
Fixed panels daylight opening	2	1038 x 1753	40-7/8 x 69	1/2"
Operable panels daylight opening	2	1038 x 1753	40-7/8 x 69	1/2"

5.7 Drainage: A sloped sill was utilized.

Drainage Method	Size	Quantity	Location
Weepslot	5/8" wide by 3/16" high	2	Sill, roller track 2-3/4" from the jambs
Weepslot	1-1/4" wide by 1/4" high	2	Sill, roller tack 2-3/4" from the jambs
Weepslot with cover	1-1/2" wide by 3/16" high	2	2-1/8" from the end of the fixed panel support
Weepslot	1-7/16" wide by 3/16" high	4	2-1/8" from the end of the fixed panel support within the hollow of the extrusion
Weepslot	1-7/16" wide by 3/16" high	2	2-1/8" from the end of the fixed panel support
Weepslot	2" wide by 1/8" high	11	Located 3-3/4", 23-1/2", 44-1/2", 49", 69-1/2", 90-1/2", 95", 115-1/2", 136-1/2", 141", 161-1/2", and 182-1/2" across the sill from jamb to jamb in the vertical leg of the outside sill cladding

5.0 Test Specimen Description: (Continued)

5.8 Hardware:

Description	Quantity	Location
One point lock with handle and keeper	1	Operable panels lock stile, 37-5/8" from bottom rail on each panel
Nylon rollers	4	Operable panel bottom rail, 4" from each stile
Rollers with springs	4	Bottom of each screen stile
Screen lock with keeper	1	Screen lock stile, 38" from bottom rail on each screen panel
Sash stopper	1	Midspan along the head
Panel head screen stopper	1	Midspan along the head

5.9 Screen Construction:

Frame Material	Corner Construction	Mesh Type	Mesh Attachment Method
Aluminum	Coped and butted, secured together with one #8 x 3/4" pan head screw per corner	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 and sill	1-1/16" wide by 3-3/16" long by 0.050" thick steel clips secured to the frame using two #8 x 1/2" pan head screws, and to the test buck using one #8 x 1-1/4" pan head screw	Located 4" from each jamb and spaced 30" on center
Jambs	#8 x 1-1/4" pan head screw	Located 4" from each corner and spaced 24" on center through the frame and into the wood buck

7.0 Test Results: The temperature during testing was 21°C (69°F). The results are tabulated as follows:

Title of Test	Results	Allowed	Note
Operating Force, per ASTM E 2068	Initiate motion: 102 N (23 lbf) Maintain motion: 27 N (6 lbf) Locks: 22 N (5 lbf)	135 N (30 lbf) max. 90 N (20 lbf) max. 100 N (22.5 lbf) max.	
Air Leakage, Infiltration per ASTM E 283 at 75 Pa (1.57 psf)	0.6 L/s/m ² (0.12 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	4
Uniform Load Deflection, per ASTM E 330 Deflections taken at meeting stile +720 Pa (+15.04 psf) -720 Pa (-15.04 psf)	19.3 mm (0.76") 14.5 mm (0.57")	Report only	5, 6, 7
Uniform Load Structural, per ASTM E 330 Permanent sets taken at meeting stile +1080 Pa (+22.56 psf) -1080 Pa (-22.56 psf)	0.8 mm (0.03") 0.3 mm (0.01")	7.4 mm (0.29") max. 7.4 mm (0.29") max.	3 6, 7
Forced Entry Resistance, per ASTM F 842, Type: C - 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)

Title of Test	Results	Allowed	Note
Optional Performance			
Water Penetration, per ASTM E 547 at 290 Pa (6.06 psf)	Pass	No leakage	3
Uniform Load Deflection, per ASTM E 330 Deflections taken at meeting stile +1200 Pa (+25.06 psf) -960 Pa (-20.05 psf)	19.3 mm (0.76") 14.5 mm (0.57")	Report only	5, 6, 7
Uniform Load Structural, per ASTM E 330 Permanent sets taken at meeting stile +1800 Pa (+37.59 psf) -1440 Pa (-30.08 psf)	3.6 mm (0.14") 2.3 mm (0.09")	7.4 mm (0.29") max. 7.4 mm (0.29") max.	6, 7

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: Test Date 02/13/17 / Time: 7:00 AM

Note 3: With and without insect screen.

Note 4: The client opted to start at a pressure higher than the minimum required. Test results are reported under Optional Performance.

Note 5: 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 6: Loads were held for 10 seconds.

Note 7: 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.

Joel Chronister
Technician

Ken R. Stough
Lead Technician

JTC: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: Drawing(s) (0) Complete drawings packet on file with Intertek-ATI.

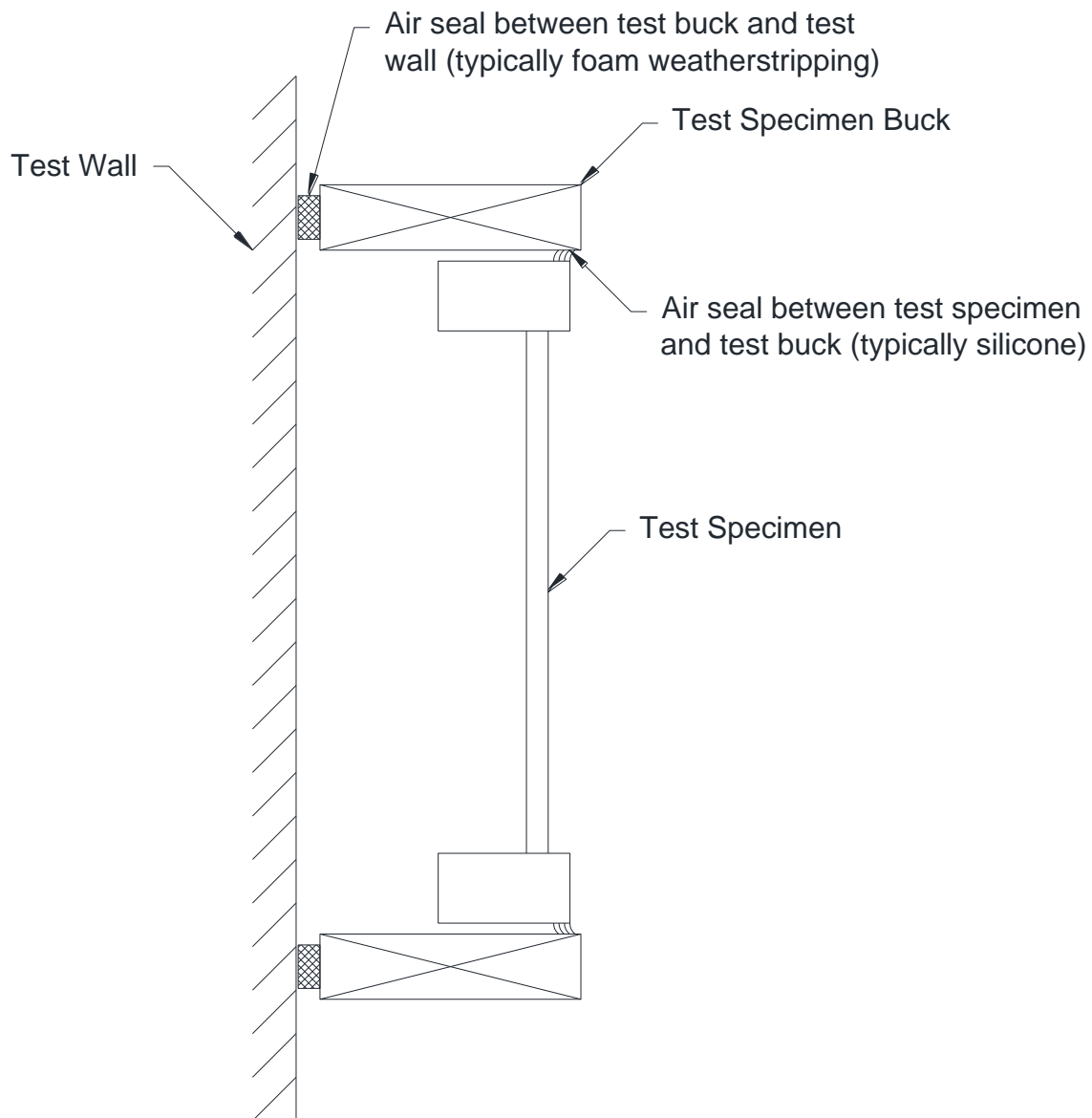
Appendix A

Alteration Addendum

Alteration #1: Date - 03/09/17
Cause for alteration – Test specimen failed Forced Entry Resistance testing
Remedial action taken – Steel reinforcement was added behind the lock keeper and longer screws were used to secure keeper to the panel stile.

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.*