TEST REPORT

Report No.: F2954.01-109-47

Rendered to:

MI WINDOWS AND DOORS, LLC
Gratz, Pennsylvania

PRODUCT TYPE: Polyvinyl Chloride (PVC) Horizontal Sliding Window (XX)
SERIES/MODEL: 1685

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 LC-PG35 2134 x 1600 (84 x 63)-HS
Design Pressure	±1680 Pa (±35.09 psf)
Air Infiltration	0.9 L/s/m^2 (0.18 cfm/ft^2)
Water Penetration Resistance Test Pressure	260 Pa (5.43 psf)

Test Completion Date: 11/20/15

Reference must be made to Report No. F2954.01-109-47, dated 12/09/15 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) Horizontal Sliding Window (XX)

3.2 Series/Model: 1685

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 LC-PG35 2134 x 1600 (84 x 63)-HS** rating.

3.4 Test Dates: 11/11/15 - 11/20/15

3.5 Test Record Retention End Date: All test records for this report will be retained until November 20, 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.

3.0 Project Summary: (Continued)

3.9 List of Official Observers:

Name	Company
Heath Lewis	MI Windows and Doors, LLC
Richie Williard	MI Windows and Doors, LLC
Jeremy R. Bender	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: 3.4 m² (37.0 ft²)	**Width**		**Height**	
	millimeters	**inches**	**millimeters**	**inches**
Overall size	2134	84	1600	63
Exterior sash	1051	41-3/8	1511	59-1/2
Interior sash	1051	41-3/8	1511	59-1/2
Screen	1041	41	1516	59-5/8

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 Panel Construction:

Panel 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 Row	Interior and exterior frame tracks of the head, sill, and jambs
0.187" backed by 0.160" high polypile with center fin	1 Row	Interior and exterior meeting stiles
0.187" backed by 0.240" high polypile with center fin	2 Rows	Top and bottom sash rails
0.187" backed by 1/2" high foam-filled flap seal	1 Row	Sash pull stile

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	Composite-reinforced butyl	1/8" clear annealed	1/8" clear annealed	Exterior glazed onto a bed of silicone and secured with snap-in PVC glazing beads

Location	Quantity	Daylight Opening		Glass Bite
		millimeters	inches	
Panel daylight opening	2	962 x 1422	37-7/8 x 56	1/2"

5.0 Test Specimen Description: (Continued)

5.6 Drainage:

Drainage Method	Size	Quantity	Location
Weepslot	1" wide by 1/8" high	2	3-1/2" from the edge of the frame on the screen track frame
Weepslot	3/4" wide by 1/4" high	4	2" from the corner on the interior and exterior track draining to the hollow below
Weepslot	1/2" wide by 5/16" high	2	Corner of the frame draining to the exterior hollow

5.7 Hardware:

Description	Quantity	Location
Metal sweep locks	2	8" from each end of the meeting stiles
Plastic housing with dual brass roller	4	Interior and exterior sash bottom rail, 1" from each end

5.8 Reinforcement:

Drawing Number	Location	Material
MS400310	Exterior meeting rail	Fiberglass pultrusion
MS400340	Interior meeting rail	Fiberglass pultrusion

5.9 Screen Construction:

Frame Material	Corner Construction	Mesh Type	Mesh Attachment Method
Extruded aluminum	Mitered 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 and jambs	#8 x 1-1/2" long flat head screws	Located 4" from the corners and spaced 12" on center, through the frame into the wood buck

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

Title of Test	Results	Allowed	Note
Operating Force, per ASTM E 2068	Initiate motion: 36 N (8 lbf) Maintain motion: 58 N (13 lbf) Locks: 4 N (1 lbf)	Report only 156 N (35 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	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)

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 Deflections taken at meeting stile			
+1680 Pa (+35.09 psf)	40.1 mm (1.58")		
-1680 Pa (-35.09 psf)	43.2 mm (1.70")	Report only	4, 5, 6
Uniform Load Structural, per ASTM E 330 Permanent sets taken at meeting stile			
+2520 Pa (+52.63psf)	1.3 mm (0.05")	5.8 mm (0.23") max.	
-2520 Pa (-52.63 psf)	1.3 mm (0.05")	5.8 mm (0.23") 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.

Digitally Signed by: Jeremy R. Bender

Jeremy R. Bender
Lead Technician

Digitally Signed by: Timothy J. McGill

Timothy J. McGill
Manager – Product Testing

JRB:asm/cmd

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.

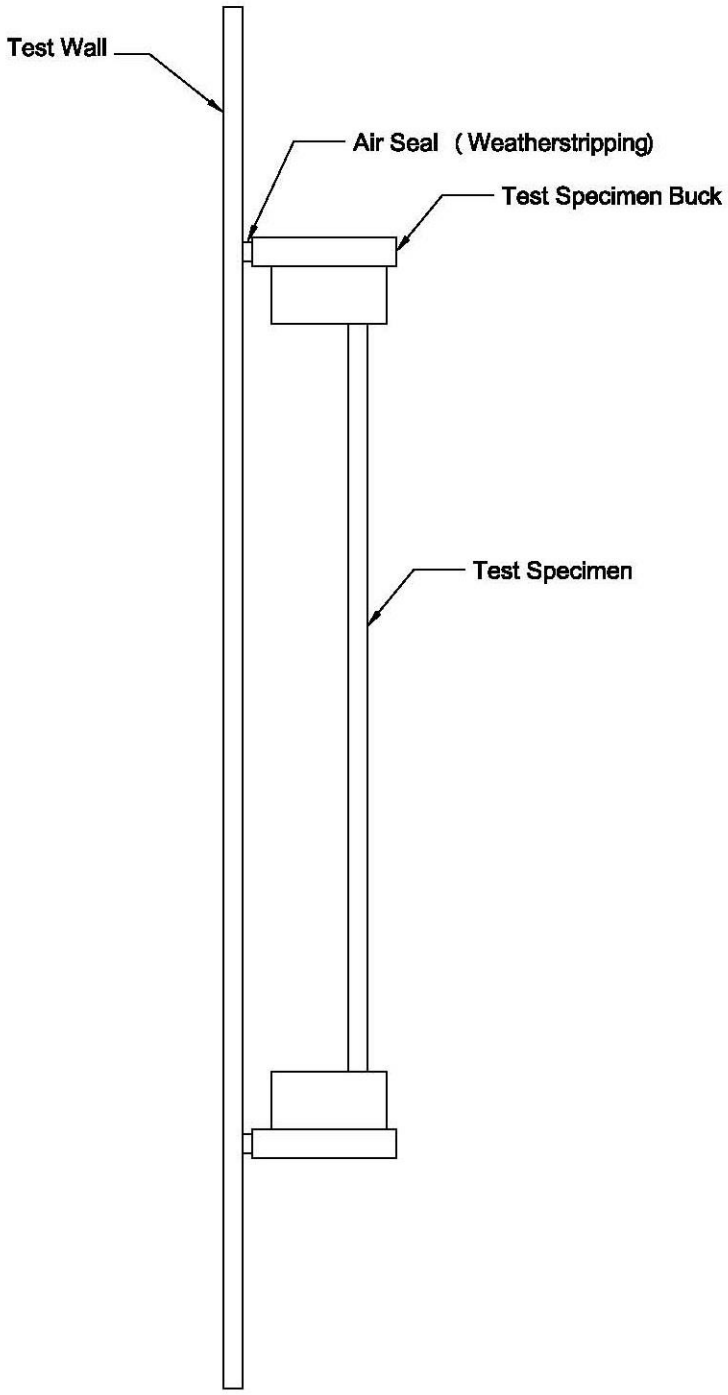
Appendix A

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.*