TEST REPORT

Report No.: H2947.01-801-44

Rendered to:

MI WINDOWS AND DOORS, LLC
Gratz, Pennsylvania

PRODUCT TYPE: Polyvinyl Chloride (PVC) Horizontal slider
SERIES/MODEL: 1630 Horizontal Slider

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

Test Dates: 02/22/17
Through: 03/31/17
Report Date: 05/31/17
Test Record Retention Date: 03/31/21

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Intertek | Architectural Testing

Summary of Results

Title	Test Specimen #1 XOX Wide Sash Fin	Test Specimen #2 XOX Standard Sash Fin
AAMA/WDMA/CSA 101/I.S.2/A440-11	Class LC-PG25 3048 x 1600 (120 x 63)-HS	Class LC-PG25 3048 x 1600 (120 x 63)-HS
Design Pressure	±1200 Pa (±25.06 psf)	±1200 Pa (±25.06 psf)
Air Infiltration	0.15 L/s/m² (0.03 cfm/ft²)	0.15 L/s/m² (0.03 cfm/ft²)
Water Penetration Resistance Test Pressure	360 Pa (7.52 psf)	360 Pa (7.52 psf)-

Title	Test Specimen #3 XOX Wide Sash Finless	Test Specimen #4 XOX Standard Sash Finless
AAMA/WDMA/CSA 101/I.S.2/A440-11	Class LC-PG25 3048 x 1600 (120 x 63)-HS	Class LC-PG25 3048 x 1600 (120 x 63)-HS
Design Pressure	±1200 Pa (±25.06 psf)	±1200 Pa (±25.06 psf)
Air Infiltration	-	-
Water Penetration Resistance Test Pressure	-	-

Test Completion Date: 03/31/17

Reference must be made to Report No. H2947.01-801-44, dated 05/31/17 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: Intertek
1909 10th St. Suite 100
Plano, TX 75074
(469) 814-0687

3.0 Project Summary:

3.1 Product Type: Polyvinyl Chloride (PVC) Horizontal Slider

3.2 Series/Model: 1630 Horizontal Slider

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/A440-11	Class LC-PG25 3048 x 1600 (120 x 63)-HS
2	101/I.S.2/A440-11	Class LC-PG25 3048 x 1600 (120 x 63)-HS
3	101/I.S.2/A440-11	Class LC-PG25 3048 x 1600 (120 x 63)-HS
4	101/I.S.2/A440-11	Class LC-PG25 3048 x 1600 (120 x 63)-HS

3.4 Test Dates: 02/22/17 - 03/31/17

3.5 Test Record Retention End Date: All test records for this report will be retained until March 31, 2021.

3.6 Test Location: Intertek-ATI test facility in Plano, Texas.

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.

3.8 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
Felipe Adame	MI Windows and Doors
Clint Barnett	Intertek
Jeff Crump	Intertek

4.0 Test Specification(s):

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

5.0 Test Specimen Description:

5.1 Product Sizes:

Test Specimen #1 and #3 XOX Wide Sash

Overall Area: 5 m^2 (52.50 ft^2)	**Width**		**Height**	
	millimeters	**Inches**	**millimeters**	**inches**
Overall size	3048	120	1600	63
Interior Sash (2)	1014	39-15/16	1522	59-15/16
Screen (2)	991	39	1499	59

Test Specimen #2 and #4 XOX Standard Sash

Overall Area: 5 m^2 (52.50 ft^2)	**Width**		**Height**	
	millimeters	**Inches**	**millimeters**	**inches**
Overall size	3048	120	1600	63
Interior Sash (2)	775	30-1/2	1522	59-15/16

5.0 Test Specimen Description: (Continued)

5.2 Frame Construction:

Frame Member	Material	Description
Head, sill and jambs - Fins	PVC	Frame
Roll Track	Aluminum	Installed into sill track
Meeting rail	PVC	Anchored to the head and sill with a #8 x 2" machine screw

	Joinery Type	Detail
Head, sill and jambs	Mitered	Fully welded.

5.3 Sash Construction:

Frame Member	Material	Description
Rails and Stiles	PVC	Extruded
Operable Screen Track	Aluminum	Extruded

	Joinery Type	Detail
Rails and Stiles	Mitered	Fully welded.

5.4 Weather-stripping:

Description	Quantity	Location
0.187 x 0.240 Pile with Fin	1 Row	Fixed meeting rail
0.187 x 0.240 Pile with Fin	1 Row	Sill Leg
0.187 x 0.240 Pile with Fin	1 Row	Sash Stiles
0.187 x 0.240 Pile with Fin	1 Row	Head and Sill of sash

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 and # 3:

Glass Type	Spacer Type	Interior Lite	Exterior Lite	Glazing Method
3/4" IG	Metal reinforced butyl	1/8" clear annealed	1/8" clear annealed	Exterior wet glazed

Location	Quantity	Daylight Opening		Glass Bite
		millimeters	inches	
Fixed daylight opening	1	927 x 1480	36-1/2 x 58-1/4	1/2"
Sash	2	927 x 1429	36-1/2 x 56-1/4	1/2"

Test Specimen #2 and # 4:

Glass Type	Spacer Type	Interior Lite	Exterior Lite	Glazing Method
3/4" IG	Metal reinforced butyl	1/8" clear annealed	1/8" clear annealed	Exterior wet glazed

Location	Quantity	Daylight Opening		Glass Bite
		millimeters	inches	
Fixed daylight opening	1	1397 x 1480	55 x 58-1/4	1/2"
Sash	2	686 x 1429	27 x 56-1/4	1/2"

5.6 Drainage:

Drainage Method	Size	Quantity	Location
Weephole with cover	1-1/4" x 1/4"	2	Exterior Frame Sill
Weephole	1" x 1"	2	End of sill track each end
Weephole	5/16" oval	2	Bottom sash each end
Weephole	7/8" x 1/8"	2	Each end through second layer of internal webbing at sill.

5.0 Test Specimen Description: (Continued)

5.7 Hardware:

Description	Quantity	Location
Cam locks	4	Sash lock rail (2 per sash)
Keepers	4	Fixed meeting rail
Weep covers	2	Frame sill weeps

5.8 Reinforcement:

Drawing Number	Location	Material
M2343010	Fixed Meeting rail	Aluminum
M2115000	Lock Rail	Aluminum

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.

Fin Installation Specimen # 1, 2

Location	Anchor Description	Anchor Location
Nailing Fin	#6 x 1-5/8" long drywall screw	2" from the corners and spaced 16" on center, through the mounting fin into the wood buck

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.

Finless Installation Specimen# 3, 4

Location	Anchor Description	Anchor Location
Head and Jambs	#10 x 1-3/8" Pan head screw	4" from the corners and spaced 16" on center, through the head and the jambs
Sill	Aluminum clips anchored into the interior of the inner wall bottom sill	Two #10 x 1-3/8" pan head screw. One clip at each meeting rail

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

Test Specimen #1: 120 x 63 XOX Wide Sash Fin

Title of Test	Results	Allowed	Note
Operating Force, per ASTM E2068	Initiate motion: 22 N (5 lbf) Maintain motion: 44 N (10 lbf)	Report Only 90 N (20 lbf) max.	
Air Leakage, Infiltration per ASTM E283 at 75 Pa (1.57 psf)	0.15 L/s/m² (0.03 cfm/ft²)	1.52 L/s/m² (0.30 cfm/ft²) max.	
Water Penetration, per ASTM E547 at 180 Pa (3.76 psf)	NA	NA	2
Uniform Load Deflection, per ASTM E330 Deflections taken at meeting rail +1200 Pa (+25.06 psf) -1200 Pa (-25.06 psf)	 45 mm (1.78") 44 mm (1.75")	 Report Only	 3, 4, 5
Uniform Load Structural, per ASTM E330 Permanent sets taken at meeting rail +1800 Pa (+37.59 psf) -1800 Pa (-37.59 psf)	 2 mm (0.06") 1 mm (0.05")	 6 mm (0.24") max. 6 mm (0.24") max.	 4, 5
Forced Entry Resistance, per ASTM F588, Type: A - Grade: 10	Pass	No entry	
Deglazing, per ASTM E987 Operating direction, 320 N (70 lbf) Remaining direction, 230 N (50 lbf)	Pass Pass	Meets as stated Meets as stated	
Thermoplastic Corner Weld	Pass	Meets as stated	

Optional Performance			
Water Penetration, per ASTM E 547 at 360 Pa (7.52 psf)	Pass	No leakage	6

Test Specimen #2: 120 x 63 XOX Small Sash Fin

Title of Test	Results	Allowed	Note
Operating Force, per ASTM E2068	Initiate motion: 22 N (5 lbf) Maintain motion: 44 N (10 lbf)	Report Only 90 N (20 lbf) max.	
Air Leakage, Infiltration per ASTM E283 at 75 Pa (1.57 psf)	0.15 L/s/m² (0.03 cfm/ft²)	1.52 L/s/m² (0.30 cfm/ft²) max.	
Water Penetration, per ASTM E547 at 180 Pa (3.76 psf)	NA	NA	2
Uniform Load Deflection, per ASTM E330 Deflections taken at meeting rail +1200 Pa (+25.06 psf) -1200 Pa (-25.06 psf)	43 mm (1.71") 43 mm (1.68")	Report Only	3, 4, 5
Uniform Load Structural, per ASTM E330 Permanent sets taken at meeting rail +1800 Pa (+37.59 psf) -1800 Pa (-37.59 psf)	2 mm (0.06") 1 mm (0.05")	6 mm (0.24") max. 6 mm (0.24") max.	4, 5
Forced Entry Resistance, per ASTM F588, Type: A - Grade: 10	Pass	No entry	
Deglazing, per ASTM E987 Operating direction, 320 N (70 lbf) Remaining direction, 230 N (50 lbf)	Pass Pass	Meets as stated Meets as stated	
Thermoplastic Corner Weld	Pass	Meets as stated	

Optional Performance			
Water Penetration, per ASTM E 547 at 360 Pa (7.52 psf)	Pass	No leakage	6

Test Specimen #3:
120 x 63 XOX Wide Sash Finless

Uniform Load Deflection, per ASTM E 330 Deflections taken at meeting rail +1200 Pa (+25.06 psf) -1200 Pa (-25.06 psf)	 40 mm (1.59") 33 mm (1.29")	 Report Only	 3,4,5
Uniform Load Structural, per ASTM E 330 Deflections taken at meeting rail +1800 Pa (+37.59 psf) -1800 Pa (-37.59 psf)	 < 1 mm (0.01") 2 mm (0.07")	 6 mm (0.24") max. 6 mm (0.24") max.	 4,5

Test Specimen #4:
120 x 63 XOX Small Sash Finless

Uniform Load Deflection, per ASTM E 330 Deflections taken at meeting rail +1200 Pa (+25.06 psf) -1200 Pa (-25.06 psf)	 43 mm (1.71") 35 mm (1.37")	 Report Only	 3,4,5
Uniform Load Structural, per ASTM E 330 Deflections taken at meeting rail +1800 Pa (+37.59 psf) -1800 Pa (-37.59 psf)	 1 mm (0.04") 2 mm (0.01")	 6 mm (0.24") max. 6 mm (0.24") max.	 4,5

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

Note 3: 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 4: Loads were held for 10 seconds.

Note 5: Tape and film were not used to seal against air leakage during structural testing. In our opinion, the tape and film did not influence the results of the test.

Note 6: With and without screen.

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

Digitally Signed by: Clint Barnett

Clint Barnett
Technician

Digitally Signed by: Jeffrey Crump

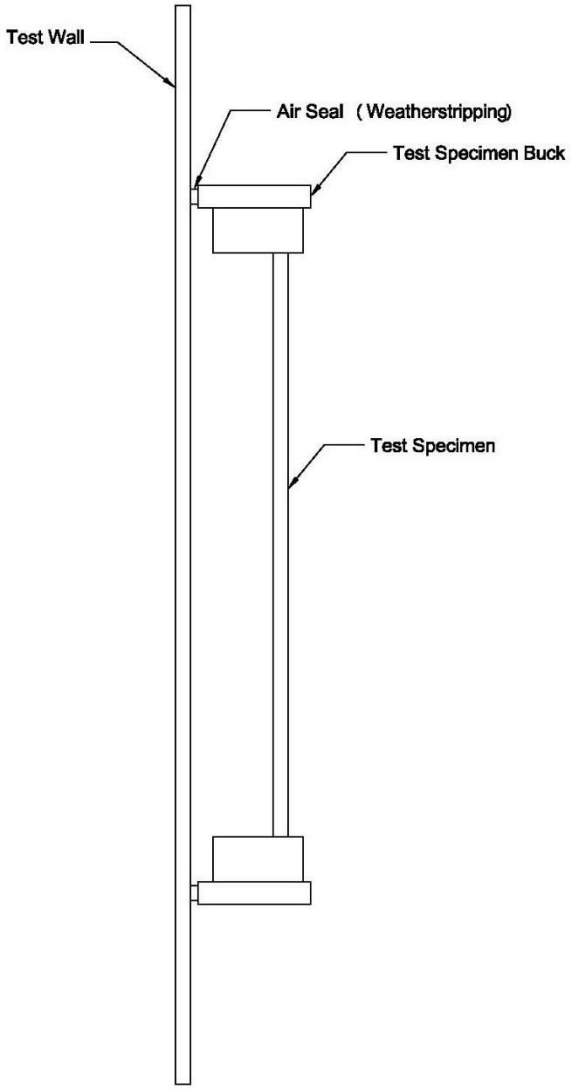
Jeffrey Crump
Sr. Project Manager

CB:cm

Attachments (pages): This report is complete only when all attachments listed are included.
Appendix-A: Location of Air Seal (1)
Appendix-B: Drawings (21)

Appendix A

Location of Air Seal: The air seal between the test specimen and the test wall is detailed below. The seal is made of foam weather-stripping 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 weather-stripping and creating a seal.



Appendix B

Drawing(s)

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