



**AAMA/WDMA/CSA 101/LS.2/A440-08
TEST REPORT**

Rendered to:

MI WINDOWS AND DOORS, INC.

SERIES/MODEL: 188

PRODUCT TYPE: Aluminum Horizontal Sliding Window (XO) (Flange)

Title	Summary of Results
Primary Product Designator	Class LC-PG55 1858 x 1574 (73 x 62)-HS
Design Pressure	± 2640 Pa (± 55.14 psf)
Operating Force (in motion)	53 N (12 lbf)
Air Infiltration	0.9 L/s/m ² (0.18 cfm/ft ²)
Water Penetration Resistance Test Pressure	400 Pa (8.35 psf)
Uniform Load Structural Test Pressure	± 3960 Pa (± 82.71 psf)
Forced Entry Resistance	Grade 10

Test Completion Date: 02/16/10

Reference must be made to Report No. 97435.01-109-47, dated 11/12/10 for complete test specimen description and data.

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A·L·I

(Validator / Operations Administrator)

**AAMA
CERTIFICATION PROGRAM****AUTHORIZATION FOR PRODUCT CERTIFICATION****MI Windows & Doors, LLC
P.O. Box 370
Gratz, PA 17030-0370****Attr: Rick Sawdey**

The product described below is hereby approved for listing in the next issue of the AAMA Certified Products Directory. The approval is based on successful completion of tests, and the reporting to the Administrator of the results of tests, accompanied by related drawings, by an AAMA Accredited Laboratory.

1. The listing below will be added to the next published AAMA Certified Products Directory.

SPECIFICATION	RECORD OF PRODUCT TESTED			
AAMA/WDMA/CSA 101/I.S.2/A440-08 LC-PG55-1858x1574 (73x62)-HS				
COMPANY AND CODE	CPD NO.	SERIES MODEL & PRODUCT DESCRIPTION	MAXIMUM SIZE TESTED	
MI Windows & Doors, LLC Code: MTL	4201	188 HS (FLANGE) (AL)(OX)(OG)(INS GL) (MODIF)(ASTM)	<u>FRAME</u> 1858 mm x 1574 mm (6'1" x 5'2")	<u>SASH</u> 913 mm x 1508 mm (3'0" x 4'11")

2. This Certification will expire **February 16, 2016 (extended from February 16, 2014 per AAMA 106-13)** and requires validation until then by continued listing in the current AAMA Certified Products Directory.

3. Product Tested and Reported by: **Architectural Testing, Inc.**

Report No.: **97435.01-109-47**Date of Report: **March 8, 2010 (Revised November 12, 2010)**

Validated for Certification

Associated Laboratories, Inc.Date: **December 19, 2013**

Authorized for Certification

Cc: AAMA
JGS
ACP-04 (Rev. 1/11)

American Architectural Manufacturers Association



AAMA/WDMA/CSA 101/I.S.2/A440-08 TEST REPORT

Rendered to:

MI WINDOWS AND DOORS, INC.
P.O. Box 370
650 West Market Street
Gratz, Pennsylvania 17030

Report No.: 97435.01-109-47
Revision 1: 11/12/10
Test Dates: 01/12/10
Through: 02/16/10
Report Date: 03/08/10
Test Record Retention Date: 02/16/14

Project Summary: Architectural Testing, Inc. was contracted by MI Windows and Doors, Inc. to witness and validate testing on a Series/Model 188, aluminum horizontal sliding window (XO) (flange) at the MI Windows and Doors, Inc. test facility in Gratz, Pennsylvania. The sample tested successfully met the performance requirements for a Class LC-PG55 1858 x 1574 (73 x 62)-HS rating. Test specimen description and results are reported herein. The sample was provided by the client.

Test Specification: The test specimen was evaluated in accordance with AAMA/WDMA/CSA 101/I.S.2/A440-08, *NAFS - North American Fenestration Standard/Specification for Windows, Doors, and Skylights*.

Test Specimen Description:

Series/Model: 188

Product Type: Aluminum Horizontal Sliding Window (XO) (Flange)

Overall Size: 1858 mm (73-1/8") wide by 1574 mm (62") high

Operable Panel Size: 913 mm (35-15/16") wide by 1508 mm (59-3/8") high

Fixed Daylight Opening Size: 879 mm (34-5/8") wide by 1489 mm (58-5/8") high

Screen Size: 898 mm (35-3/8") wide by 1530 mm (60-1/4") high

Overall Area: 3.0 m² (31.94 ft²)

Test Specimen Description: (Continued)

Finish: All aluminum was painted.

Frame Construction: All frame members were constructed from extruded aluminum. Corners were coped, butted, sealed with silicone, and secured using two #8 x 3/4" long Phillips pan head screws per corner. The fixed meeting stile was secured using two #8 x 1-1/4" long Phillips pan head screws at each end.

Panel Construction: All panel members were constructed from extruded aluminum. Corners were coped, butted, sealed with silicone, and secured using two #6 x 3/4" long Phillips pan head screws per corner.

Weatherstripping:

<u>Description</u>	<u>Quantity</u>	<u>Location</u>
0.187" backed by 0.250" high polypile with center fin	1 Row	Jambs, interior meeting stile, and top and bottom rails
0.187" backed by 1/4" diameter vinyl bulb	1 Row	Operable panel jamb stile
3/16" by 5/8", 0.240" high polypile with center fin	1	Each end of interior meeting stile

Glazing Details: The window was glazed with 5/8" thick insulating glass constructed from two sheets of 1/8" thick clear annealed glass and a metal reinforced butyl spacer system. The glass was set from the exterior against a bed of silicone and was secured with snap-in extruded PVC glazing beads.

Drainage:

<u>Description</u>	<u>Quantity</u>	<u>Location</u>
3-1/4" long by 3/16" wide weep notch with vinyl housing	2	Sill face, 3" from each end

Hardware:

<u>Description</u>	<u>Quantity</u>	<u>Location</u>
Metal cam-locks	2	Lock stile, 6-1/2" from each end

Test Specimen Description: (Continued)

Hardware: (Continued)

<u>Description</u>	<u>Quantity</u>	<u>Location</u>
Aluminum retainer spring	2	Each end of screen lock stile
Vinyl pull tab	2	Screen pull stile, 8-1/2" from each end
Aluminum roller track	1	Interior sill track

Reinforcement: No reinforcement was utilized.

Screen Construction: All screen members were constructed from roll-formed aluminum. Corners were square-cut and secured using a plastic corner key. The fiberglass mesh screen was secured using a flexible vinyl spline.

Installation: The window was installed into a Spruce-Pine-Fir wood buck. The window was secured to the buck through the head using #8 x 1-1/4" long pan head screws, located 3" from each corner and midspan. The window was secured to the buck through the jambs using #8 x 1-1/4" long pan head screws, located 6" and 14" from each end. The exterior perimeter was sealed with silicone.

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

<u>Paragraph</u>	<u>Title of Test - Test Method</u>	<u>Results</u>	<u>Allowed</u>
5.3.1	Operating Force per ASTM E 2068		
	Initiate motion	80 N (18 lbf)	Report Only
	Maintain motion	53 N (12 lbf)	115 N (25 lbf)
	Locks	9 N (2 lbf)	100 N (22.5 lbf)
5.3.2.1	Air Leakage Resistance per ASTM E 283		
	75 Pa (1.6 psf)	0.9 L/s/m ² (0.18 cfm/ft ²)	1.5 L/s/m ² (0.3 cfm/ft ²) max.

Note #1: The tested specimen meets (or exceeds) the performance levels specified in AAMA/WDMA/CSA 101/LS.2/A440 for air leakage resistance.

Test Results: (Continued)

<u>Paragraph</u>	<u>Title of Test - Test Method</u>	<u>Results</u>	<u>Allowed</u>
5.3.3.2	Water Penetration Resistance per ASTM E 547		See Note #2
5.3.4.2	Uniform Load Deflection per ASTM E 330		See Note #2
5.3.4.3	Uniform Load Structural per ASTM E 330		See Note #2
<i>Note #2: The client opted to start at a pressure higher than the minimum required. Those results are listed under "Optional Performance".</i>			
5.3.5	Forced Entry Resistance per ASTM F 588		
	Type: A	Grade: 10	
	Disassembly Test	No entry	No entry
	Test A1 through A7	No entry	No entry
	Sash/Panel Manipulation Test	No entry	No entry
	Lock Hardware Manipulation Test	No entry	No entry
5.3.6.3	Deglazing Test		
	In operating direction - 320 N (70 lbf)		
	Left stile	1.0 mm (0.04")	11.4 mm (0.45")
	Right stile	1.3 mm (0.05")	11.4 mm (0.45")
	In remaining direction - 230 N (50 lbf)		
	Top rail	0.8 mm (0.03")	11.4 mm (0.45")
	Bottom rail	4.3 mm (0.17")	11.4 mm (0.45")

Optional Performance

4.3.2.1	Water Penetration Resistance per ASTM E 547 (with and without insect screen) 400 Pa (8.35 psf)	No leakage	No leakage
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Test Results: (Continued)

<u>Paragraph</u>	<u>Title of Test - Test Method</u>	<u>Results</u>	<u>Allowed</u>
<u>Optional Performance: (Continued)</u>			
4.3.2.1	Uniform Load Deflection per ASTM E 330 (Deflections were taken on the meeting stile) (Loads were held for 10 seconds)		
	2640 Pa (55.14 psf) (positive)	19.3 mm (0.76")	See Note #3
	2640 Pa (55.14 psf) (negative)	20.3 mm (0.80")	See Note #3

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.

4.3.2.1	Uniform Load Structural per ASTM E 330 (Permanent sets were taken on the meeting stile) (Loads were held for 10 seconds)		
	3960 Pa (82.71 psf) (positive)	0.5 mm (0.02")	6.1 mm (0.24") max.
	3960 Pa (82.71 psf) (negative)	1.8 mm (0.07")	6.1 mm (0.24") max.

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.

Drawing Reference: The test specimen drawings have been reviewed by Architectural Testing and are representative of the test specimen reported herein.

List of Official Observers:

<u>Name</u>	<u>Company</u>
Rick Sawdey	MI Windows and Doors, Inc.
Emily C. Riley	Architectural Testing, Inc.

Detailed drawings, data sheets, representative samples of test specimens, a copy of this report, or other pertinent project documentation will be retained by Architectural Testing, Inc. for a period of four years from the original test date. At the end of this retention period, such materials shall be discarded without notice and the service life of this report will expire.

Results obtained are tested values and were secured by using the designated test methods. No conclusions of any kind regarding the adequacy or inadequacy of the glass in the test specimen can be made. 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.



Digitally Signed for: Emily C. Riley by Vicki L. McElwain

Emily C. Riley
Technician



Digitally Signed by: Michael D. Stremmel

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

ECR:dem

Attachments (pages): This report is complete only when all attachments listed are included.

Appendix-A: Alteration Addendum (1)

Appendix-B: Test Equipment (1)

Appendix-C: Complete drawings packet on file with Architectural Testing, Inc.

Revision Log

<u>Rev. #</u>	<u>Date</u>	<u>Page(s)</u>	<u>Revision(s)</u>
0	03/08/10	N/A	Original report issue
1	11/12/10	Summary Page, Pages 1, and 2	Revised test specimen overall width measurements from 1854 mm to 1858 mm and from 73" to 73-1/8"

Appendix A

Alteration Addendum

Alteration #1: Date-01/12/10
Cause for alteration - On Specimen #3 the fixed lite broke at -82.71 psf.
Remedial action taken - Replaced unit

Appendix B
Test Equipment

Instrument	Manufacturer	Asset #
Linear Transducer	Celesco	E1603001A
Linear Transducer	Celesco	J1705016A
Linear Transducer	Celesco	J1705014A
Force Gauge	Chatillon	E33653
Deglazing Tool	Allenair	126
Control Panel	Architectural Testing, Inc.	MI-1

Appendix C

Drawings

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