Architectural Testing

AAMA/WDMA/CSA 101/I.S.2/A440-05
TEST REPORT

Rendered to:

MI WINDOWS AND DOORS, INC.

SERIES/MODEL: Pro 5000 Series / 5800
PRODUCT TYPE: Polyvinyl Chloride (PVC) XO Horizontal Sliding Window

	Summary of Results	
Title	**Test Specimen #1**	**Test Specimen #2**
Primary Product Designator	HS-R15 2135 x 1830 (84 x 72)	HS-R20 1827 x 1827 (72 x 72)
Design Pressure	±720 Pa (±15.04 psf)	±960 Pa (±20.05 psf)
Operating Force (in motion)	53 N (12.0 lbf)	-
Air Infiltration	0.3 L/s/m^2 (0.05 cfm/ft^2)	-
Water Penetration Resistance Test Pressure	220 Pa (4.59 psf)	-
Uniform Load Structural Test Pressure	±1080 Pa (±22.56 psf)	±1440 Pa (±30.08 psf)
Forced Entry Resistance	ASTM F 588 Grade 10	-

Test Completion Date: 01/21/10

Reference must be made to Report No. 97898.01-301-44, dated 03/04/10 for complete test specimen description and data.

2524 E. Jensen Ave
Fresno, CA 93706
phone: 559-233-8705
fax: 559-233-8360
www.archtest.com

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

Attn: 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 R-PG15-2135x1830 (84x72)-HS				
COMPANY AND CODE	**CPD NO.**	**SERIES MODEL & PRODUCT DESCRIPTION**	**MAXIMUM SIZE TESTED**	
MI Windows & Doors, LLC Code: MTL	**3788**	**5800 PRO 5000 HS (FIN) (PVC)(OX)(OG)(INS GL) (MODIF)(REINF)(ASTM)**	**FRAME 2135 mm x 1830 mm (7'0" x 6'0")**	**SASH 1075 mm x 1770 mm (3'6" x 5'10")**

2. This Certification will expire **January 21, 2016 (extended from January 21, 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.: **97898.01-301-44**

Date of Report: **March 4, 2010**

Validated for Certification

Associated Laboratories, Inc.

Date: **December 5, 2013**

Authorized for Certification

American Architectural Manufacturers Association

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

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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 R-PG20-1827x1827 (72x72)-HS				
COMPANY AND CODE	CPD NO.	SERIES MODEL & PRODUCT DESCRIPTION	MAXIMUM SIZE TESTED	
			FRAME	SASH
MI Windows & Doors, LLC Code: MTL	3789	5800 PRO 5000 HS (FIN) (PVC)(OX)(OG)(INS GL) (MODIF)(REINF)(ASTM)	1827 mm x 1827 mm (6'0" x 6'0")	924 mm x 1769 mm (3'0" x 5'10")

2. This Certification will expire **January 21, 2016 (extended from January 21, 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.**

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ACP-04 (Rev. 1/11)

Architectural Testing

AAMA/WDMA/CSA 101/I.S.2/A440-05 TEST REPORT

Rendered to:

MI WINDOWS AND DOORS, INC.
7555 East State Highway Route 69
Prescott Valley, Arizona 86314

Report No.:	97898.01-301-44
Test Dates:	01/20/10
Through:	01/21/10
Report Date:	03/04/10
Expiration Date:	01/21/14

Project Summary: Architectural Testing, Inc. was contracted by MI Window and Doors, Inc. to witness testing on two Series/Model Pro 5000 Series / 5800, polyvinyl chloride (PVC) XO horizontal sliding windows at the MI Window and Doors, Inc. test facility in Prescott Valley, Arizona. The samples tested successfully met the performance requirements for the following ratings: Test Specimen #1: HS-R15 2135 x 1830 (84 x 72) and Test Specimen #2: HS-R20 1827 x 1827 (72 x 72). Test specimen description and results are reported herein. The samples were provided by the client.

Test Specification: The test specimens were evaluated in accordance with:

AAMA/WDMA/CSA 101/I.S.2/A440-05, *Standard/Specification for Windows, Doors, and Unit Skylights.*

Test Specimen Description:

Series/Model: Pro 5000 Series / 5800

Product Type: Polyvinyl Chloride (PVC) XO Horizontal Sliding Window

Test Specimen #1: HS-R15 2135 x 1830 (84 x 72)

Overall Size: 2135 mm (84-1/16") wide by 1830 mm (72-1/16") high

Active Panel Size: 1075 mm (42-5/16") wide by 1770 mm (69-11/16") high

Fixed Lite Daylite Opening Size: 990 mm (39") wide by 1750 mm (68-7/8") high

2524 E. Jensen Ave
Fresno, CA 93706
phone: 559-233-8705
fax: 559-233-8360
www.archtest.com

Test Specimen Description: (Continued)

Test Specimen #1: HS-R15 2135 x 1830 (84 x 72) (Continued)

Screen Size: 1045 mm (41-1/8") wide by 1781 mm (70-1/8") high

Overall Area: 3.91 m^2 (42.06 ft^2)

Test Specimen #2: HS-R20 1827 x 1827 (72 x 72)

Overall Size: 1827 mm (71-15/16") wide by 1827 mm (71-15/16") high

Active Panel Size: 924 mm (36-3/8") wide by 1769 mm (69-5/8") high

Fixed Lite Daylite Opening Size: 837 mm (32-15/16") wide by 1750 mm (68-7/8") high

Screen Size: 892 mm (35-1/8") wide by 1781 mm (70-1/8") high

Overall Area: 3.34 m^2 (35.93 ft^2)

Finish Specimen #1: All PVC was white.

Finish Specimen #2: All PVC was tan.

The following descriptions apply to both specimens.

Frame Construction: All members were constructed of extruded PVC. The corners were mitered and fully welded. The exterior meeting stile was secured to the frame using two #6 x 1-1/2" Phillips pan head screws with a washer and rubber gasket. A snap-in roller track insert was employed at the interior sill track. Anti-lifts were employed at the interior head track at the active panel.

Panel Construction: All members were constructed of extruded PVC. The corners were mitered and fully welded. The interlock was held back 1" from each end. The interlock was notched 2-1/2" for the lock.

Weatherstripping:

Description	Quantity	Location
0.250" tall x 0.187" backed Polypile with center fin	1 Row	All members of the active panel and the exterior meeting stile.

Test Specimen Description: (Continued)

Glazing Details: The window utilized 3/4" thick overall sealed insulating glass. The insulating glass was comprised of two 1/8" thick clear annealed sheets with a U-shaped coated steel dual seal (CU-D) spacer system. The glass was exterior glazed onto a 3/8" wide x 1/16" thick glazing tape with the corners sealed with silicone and secured with a snap-in extruded PVC glazing bead.

Drainage:

Description	Quantity	Location
1-3/8" x 1/4" weephole with cover (1-1/16" x 3/16" effective area)	2	2-7/8" from each end of the sill face through first layer of internal webbing.
1/4" x 3/16" oval weephole	2	1" from each end of the screen sill track.
5/16" x 3/16" oval	1	2-5/8" from the jamb at the fixed lite glazing track.
7/8" x 1/8" weephole	2	Each end through second layer of internal webbing.

Roller track was held-back 5/8" from each end of the interior sill track.

Hardware:

Description	Quantity	Location
Sweep lock	1	Midspan of the active panel meeting stile secured with two #6 x 1" Phillips flat head self-drilling screws fastened into the reinforcement.
Keeper	1	Opposite the lock on the exterior meeting stile secured with two #6 x 3/4" Phillips flat head self-drilling screws fastened into the reinforcement.
Plastic rollers with housing	2	Each end of the active panel bottom rail secured with two #6 x 3/8" Phillips pan head screws.

Test Specimen Description: (Continued)

Reinforcement: Roll formed aluminum reinforcement (part# M-90950) was employed at the jamb stile of the active panel secured with #6 x 1/2" Phillips pan head self-drilling screws 4-3/4" – 7-1/2" from each end and at midspan. Roll formed steel reinforcement (part# SS-6791) was employed at the meeting stile of the active panel. Roll formed steel reinforcement (part# SS-6818) was employed at the exterior meeting stile.

Screen Construction: All members were constructed of roll formed aluminum. The corners were square cut and attached with plastic corner keys. The fiberglass mesh cloth was held-in-place using a hollow vinyl spline. Two pull tabs and two spring retainers were employed.

Installation: The window was installed into a 2 x 8 test buck constructed of wood. The nailing fin was set against the test buck and secured using #6 x 1-5/8" screws located 3" from each corner and 12" on center. The rough opening was 1/2" wider and a 3/8" taller than the window. The nailing fin was sealed to the test buck with silicone.

Test Results: The temperature during testing was 16-19°C (61-66°F). The results are tabulated as follows:

Paragraph	Title of Test - Test Method	Results	Allowed
Test Specimen #1:			
5.3.1	Operating Force per ASTM E 2068		
	Open		
	Initiate motion	92 N (20.7 lbf)	Report Only
	Maintain motion	53 N (12.0 lbf)	90 N (20.2 lbf)
	Lock	9 N (2.0 lbf)	100 N (22.5 lbf)
	Close		
	Initiate motion	53 N (12.0 lbf)	Report Only
	Maintain motion	44 N (10.0 lbf)	90 N (20.2 lbf)
	Lock	9 N (2.0 lbf)	100 N (22.5 lbf)

Test Results: (Continued)

Test Specimen #1: (Continued)

Paragraph	Title of Test - Test Method	Results	Allowed
5.3.2.1	Air Leakage Resistance per ASTM E 283		
	75 Pa (1.57 psf)	0.3 L/s/m^2 (0.05 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/I.S.2/A440-05 for air leakage resistance.*

5.3.3.2	Water Penetration Resistance per ASTM E 547	See Note #2

***Note #2**: The client opted to start at a pressure higher than the minimum required. Those results are listed under "Optional Performance".*

5.3.4.2	Uniform Load Deflection per ASTM E 330		
	(Deflections were taken on the exterior meeting stile)		
	(Loads were held for 10 seconds)		
	720 Pa (15.04 psf) (positive)	38.8 mm (1.53")	See Note #3
	720 Pa (15.04 psf) (negative)	38.0 mm (1.50")	See Note #3

***Note #3**: The deflections reported are not limited by AAMA/WDMA/CSA 101/I.S.2/A440-05 for this product designation. The deflection data is recorded in this report for special code compliance and information only.*

5.3.4.3	Uniform Load Structural per ASTM E 330		
	(Permanent sets were taken on the exterior meeting stile)		
	(Loads were held for 10 seconds)		
	1080 Pa (22.56 psf) (positive)	4.5 mm (0.18")	7.0 mm (0.28") max.
	1080 Pa (22.56 psf) (negative)	4.8 mm (0.19")	7.0 mm (0.28") max.

Test Results: (Continued)

Test Specimen #1: (Continued)

Paragraph	Title of Test - Test Method	Results	Allowed
5.3.5	Forced Entry Resistance per ASTM F 588 Type: A	Grade: 10	
	Disassembly Test	No entry	No entry
	Test A1	No entry	No entry
	Test A2	No entry	No entry
	Test A3	No entry	No entry
	Test A4	No entry	No entry
	Test A5	No entry	No entry
	Test A7	No entry	No entry
	Panel Manipulation Test	No entry	No entry
	Lock Hardware Manipulation Test	No entry	No entry
5.3.6.2	Thermoplastic Corner Weld Test	Meets as stated	Meets as stated
5.3.6.3	Deglazing Test In operating direction - 320 N (71.94 lbf)		
	Jamb Stile	3.8 mm (0.15")	11.4 mm (0.45")
	Lock Stile	3.5 mm (0.14")	11.4 mm (0.45")
	In remaining direction - 230 N (51.71 lbf)		
	Top Rail	2.5 mm (0.10")	11.4 mm (0.45")
	Bottom Rail	2.5 mm (0.10")	11.4 mm (0.45")
Optional Performance			
4.4.2.6	Water Penetration Resistance per ASTM E 547 (With and without insect screen) 220 Pa (4.59 psf)	No leakage	No leakage.

Test Results: (Continued)

Test Specimen #2:

Paragraph	Title of Test - Test Method	Results	Allowed
Optional Performance			
4.4.2.6	Uniform Load Deflection per ASTM E 330 (Deflections were taken on the exterior meeting stile) (Loads were held for 10 seconds)		
	960 Pa (20.05 psf) (positive)	37.3 mm (1.47")	See Note #3
	960 Pa (20.05 psf) (negative)	43.3 mm (1.70")	See Note #3
4.4.2.6	Uniform Load Structural per ASTM E 330 (Permanent sets were taken on the exterior meeting stile) (Loads were held for 10 seconds)		
	1440 Pa (30.08 psf) (positive)	4.5 mm (0.18")	7.0 mm (0.28") max.
	1440 Pa (30.08 psf) (negative)	5.0 mm (0.20")	7.0 mm (0.28") 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:

Name	Company
Mike Maystadt	MI Windows and Doors, Inc.
Russ Wilkerson	MI Windows and Doors, Inc.
Ricardo Cortes	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. If test specimen contains glazing, 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.

Ricardo Cortes

Digitally Signed by: Ricardo Cortes

Ricardo Cortes
Technician

K.C. White

Digitally Signed by:Kenny C. White

Kenny C. White
Laboratory Manager

JO: ms

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: Drawings (12)

Revision Log

Rev. #	Date	Page(s)	Revision(s)
0	03/04/10	N/A	Original report issue

Appendix A

Alteration Addendum

***Note**: No alterations were required.*

Appendix B

Test Equipment

Instrument	Manufacturer	Asset #
Force Gauge	Imada	183073
Control Panel	MI Windows and Doors	1
Rain Rack	MI Windows and Doors	2
Dial indicator	Starret	87942-7
Dial indicator	SPI	8901137
Dial indicator	Starret	87942-4
Digital indicator	Mitutoyo	001606
Deglazing Apparatus	MI Windows and Doors	83501865 / 87492-12
Pressure Loop	GE Druck	87942-13
Force Gauge	Shimpo	428309
Hanging Scale	Dillon	D40423 / 87942-11