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 5500 Single Hung
PRODUCT TYPE: Polyvinyl Chloride (PVC) Single Hung Window

Title	Summary of Results
Primary Product Designator	H-LC25 1219 x 1978 (48 x 78)
Design Pressure	±1200 Pa (±25.06 psf)
Operating Force (in motion)	147 N (33.0 lbf)
Air Infiltration	0.61 L/s/m^2 (0.12 cfm/ft^2)
Water Penetration Resistance Test Pressure	220 Pa (4.59 psf)
Uniform Load Structural Test Pressure	±1800 Pa (±37.59 psf)
Forced Entry Resistance	ASTM F 588 Grade 10 CAWM

Test Completion Date: 06/29/10

Reference must be made to Report No. A2225.01-301-47, dated 08/04/10 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 LC-PG25-1219x1978 (48x78)-H				
COMPANY AND CODE	**CPD NO.**	**SERIES MODEL & PRODUCT DESCRIPTION**	**MAXIMUM SIZE TESTED**	
MI Windows & Doors, LLC Code: MTL	**4827**	**5500 PRO 5000 SH (FIN) (PVC)(O/X)(OG)(INS GL) (MODIF)(REINF)(ASTM) (CMBSO)**	**FRAME 1219 mm x 1978 mm (4'0" x 6'6")**	**SASH 1162 mm x 995 mm (3'10" x 3'3")**

2. This Certification will expire **June 29, 2016 (extended from June 29, 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.: **A2225.01-301-47**

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

Validated for Certification

Associated Laboratories, Inc.

Date: **April 21, 2014**

Authorized for Certification

American Architectural Manufacturers Association

Cc: AAMA
JGS
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 Route 69
Prescott Valley, Arizona 86314

Report No.:	A2225.01-301-47
Test Dates:	06/28/10
Through:	06/29/10
Report Date:	08/04/10
Expiration Date:	06/29/14

Project Summary: Architectural Testing, Inc. was contracted by MI Windows and Doors, Inc. to witness and validate testing on a Series/Model Pro 5000 Series 5500 Single Hung, Polyvinyl Chloride (PVC) Single Hung Window at the MI Windows and Doors, Inc. test facility in Prescott Valley, Arizona. The sample tested successfully met the performance requirements for a H-LC25 1219 x 1978 (48 x 78) 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 the following:

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

CAWM 301, *Forced Entry Resistance Tests for Windows.*

Test Specimen Description:

Series/Model: Pro 5000 Series 5500 Single Hung

Product Type: Polyvinyl Chloride (PVC) Single Hung Window

Overall Size: 1219 mm (48") wide by 1978 mm (77-7/8") high

Daylite Opening Size: 1142 mm (44-15/16") wide by 911 mm (35-7/8") high

Sash Size: 1162 mm (45-3/4") wide by 995 mm (39-3/16") high

Screen Size: 1170 mm (46-1/16") wide by 968 mm (38-1/8") high

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

Test Specimen Description: (Continued)

Overall Area: 2.41 m^2 (25.95 ft^2)

Finish: All PVC was white.

Frame Construction: All members were constructed of extruded PVC. The corners were mitered and fully welded. The exterior meeting rail was secured at each end with two #6 x 1-1/2" Phillips pan head screws with washer and rubber gasket.

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

Weatherstripping:

Description	Quantity	Location
0.250" tall x 0.187" backed Polypile with center fin	1 Row	Exterior meeting rail and all members of the sash.

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" tall glazing tape and secured with a snap-in extruded PVC glazing bead.

Drainage:

Description	Quantity	Location
1-9/16" x 3/16" oval weephole (1-1/16" x 1/8" effective)	2	2-1/4" from each end on outer sill face.
1-3/8" x 3/16" oval weephole	2	2-1/4" from each end through first layer of internal webbing.
3/4" x 1/8" weephole	2	Each end through second layer of internal webbing.
5/16" x 3/16" oval weephole	2	2-3/8" from each end in screen track.
1" x 3/16" oval weephole	2	2-3/8" from each end in sill track.
1/2" x 3/16" oval weephole	2	2-3/8" from each end on bottom rail through both layers.

Test Specimen Description: (Continued)

Hardware:

Description	Quantity	Location
Block and tackle balance	2	Each jamb.
Balance shoe	2	Top of each stile secured with two #6 x 3/8" Phillips pan head screws each.
Cam lock	1	Midspan on top rail secured with two #6 x 1" Phillips flat head self drilling screws through the reinforcement.
Keeper	1	Opposite lock on exterior meeting rail secured with two #6 x 3/4" Phillips flat head self drilling screws through the reinforcement.

Reinforcement: Roll formed steel reinforcement (part# SS6818-1) was utilized in the exterior meeting rail. Roll formed steel reinforcement (part# SS-6791) was utilized in the top rail of the sash.

Screen Construction: All members were constructed of rolled 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 #2 Spruce, Pine, Fur (SPF). The nailing fin was set against the test buck and secured using #6 x 1-5/8" drywall screws located 4" from each corner and 10" on center. The rough opening was 7/16" wider and a 9/16" taller than the window. The nailing fin was sealed to the test buck with silicone.

Test Results: The temperature during testing was 27-31°C (80-88°F). The results are tabulated as follows:

Paragraph	Title of Test - Test Method	Results	Allowed
5.3.1	Operating Force per ASTM E 2068		
	Open		
	Initiate motion	77 N (17.3 lbf)	Report Only
	Maintain motion	142 N (32.0 lbf)	155 N (34.8 lbf)
	Latches	12 N (2.7 lbf)	100 N (22.5 lbf)
	Close		
	Initiate motion	40 N (9.0 lbf)	Report Only
	Maintain motion	147 N (33.0 lbf)	155 N (34.8 lbf)
	Latches	10 N (2.2 lbf)	100 N (22.5 lbf)
5.3.2.1	Air Leakage Resistance per ASTM E 283		
	75 Pa (1.57 psf)	0.61 L/s/m^2 (0.12 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 rail)		
	(Loads were held for 10 seconds)		
	1200 Pa (25.06 psf) (positive)	12.3 mm (0.48")	See Note #3
	1200 Pa (25.06 psf) (negative)	12.0 mm (0.47")	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 rail)		
	(Loads were held for 10 seconds)		
	1800 Pa (37.59 psf) (positive)	0.5 mm (0.02")	4.7 mm (0.18") max.
	1800 Pa (37.59 psf) (negative)	0.5 mm (0.02")	4.7 mm (0.18") max.

Test Results: (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
	Sash/Panel Manipulation Test	No entry	No entry
	Lock Hardware Manipulation Test	No entry	No entry
	Forced Entry Resistance per CAWM 301		
	Type: I		
	Disassembly Test	No entry	No entry
	Test A	No entry	No entry
	Test B	No entry	No entry
	Test C	No entry	No entry
	Test E	No entry	No entry
	Test D	No entry	No entry
	Test E	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 (71.9 lbf)		
	Top Rail	1.0 mm (0.04")	11.4 mm (0.45")
	Bottom Rail	1.8 mm (0.07")	11.4 mm (0.45")
	In remaining direction - 230 N (51.7 lbf)		
	Left Stile	1.0 mm (0.04")	11.4 mm (0.45")
	Right Stile	0.5 mm (0.02")	11.4 mm (0.45")

Test Results: (Continued)

Paragraph	Title of Test - Test Method	Results	Allowed
	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

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.
Jeffrey T. Osugi	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.

Jeff Osugi
Digitally Signed by: Jeffery Osugi

Jeffrey T. Osugi
Technician

Leaton Kirk / m.s.
Digitally Signed for: Leaton Kirk by Marisela Saavedra

Leaton Kirk
Director – Regional Operations

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 (11)

Revision Log

Rev. #	Date	Page(s)	Revision(s)
0	08/04/10	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
Force Gauge	Shimpo	428309
Control Panel	MI Windows and Doors	1
Rain Rack	MI Windows and Doors	2
Deglazing Apparatus	MI Windows and Doors	83501865 / 87492-12
Pressure Loop	GE Druck	87942-13
Dial indicator	Starret	87942-9
Digital indicator	Mitutoyo	001606
Dial indicator	Starret	87942-8
Hanging Scale	Dillon	D40423 / 87942-11

Appendix C

Drawings