

**AAMA/WDMA/CSA 101/LS.2/A440-05
TEST REPORT**

Rendered to:

MI WINDOWS AND DOORS, INC.

SERIES/MODEL: Homemaker II 390

PRODUCT TYPE: Polyvinyl Chloride (PVC) XO Sliding Glass Door

Title	Summary of Results
Primary Product Designator	SGD-R20 2437 x 2440 (96 x 96)
Design Pressure	± 960 Pa (± 20.08 psf)
Operating Force (in motion)	41 N (9.3 lbf)*
Air Infiltration	0.66 L/s/m ² (0.13 cfm/ft ²)*
Water Penetration Resistance Test Pressure	150 Pa (3.13 psf)*
Uniform Load Structural Test Pressure	\pm Pa (± 30.08 psf)
Forced Entry Resistance	ASTM F 842 Grade 10 CAWM

Test Completion Date: 10/28/10

Reference must be made to Report No. A2227.02-301-47 dated 11/22/10 for complete test specimen description and data. Reference Architectural Testing, Inc. Report No. 96430.01-301-44, dated 07/22/10 for complete *Gateway* test specimen description and test results.

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

Rendered to:

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

Report No.: A2227.01-301-47
Test Dates: 06/30/10
Through: 10/28/10
Report Date: 11/22/10
Expiration Date: 10/28/14

Project Summary: Architectural Testing, Inc. was contracted by MI Windows and Doors, Inc. to perform and witness testing on a Series/Model Homemaker II 390, Polyvinyl Chloride (PVC) XO Sliding Glass Door. ASTM 2068, ASTM E 283, ASTM E 547 and ASTM E 330 were performed at the MI Windows and Doors, Inc. test facility in Prescott Valley, Arizona. ASTM F 842 and ASTM E 987 were performed at the Architectural Testing, Inc. test facility in Fresno, California. The sample tested successfully met the performance requirements for a SGD-R20 2437 x 2440 (96 x 96) rating. Test specimen description and results are reported herein. Reference Architectural Testing, Inc. Report No. 96430.01-301-44, dated 07/22/10 for complete *Gateway* test specimen description and test results. 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.*

Test Specimen Description:

Series/Model: Homemaker II 390

Product Type: Polyvinyl Chloride (PVC) XO Sliding Glass Door

Overall Size: 2437 mm (95-15/16") wide by 2440 mm (96-1/16") high

Daylite Opening Size: 1128 mm (44-7/16") wide by 2263 mm (89-1/8") high

Panel Size: 1250 mm (49-3/16") wide by 2382 mm (93-3/4") high

Screen Size: 1128 mm (44-7/16") wide by 2262 mm (89-1/16") high

Test Specimen Description: (Continued)

Overall Area: 5.95 m² (64.01 ft²)

Finish: All PVC was white.

Frame Construction: All members were constructed of extruded PVC. The corners were mitered and fully welded. The exterior meeting stile was secured through the frame with two #8 x 2" Phillips pan head screws with washer and rubber gasket at each end. PVC equal sightline adapters were employed at the head and the sill at the fixed lite. An extruded aluminum roller track was employed at the sill and held back 3/8" from each end. Two anti lifts were employed above the active panel secured with one #6 x 3/4" Phillips flat head self drilling screw.

Panel Construction: All members were constructed of extruded PVC. The corners were mitered and fully welded.

Weatherstripping:

<u>Description</u>	<u>Quantity</u>	<u>Location</u>
0.260" high polypile with center fin	2 Rows	Top and bottom rails and jamb stile of panel.
0.260" high polypile with center fin	1 Row	Exterior meeting stile.
0.260" high polypile with center fin	1 Row	Interior meeting stile.

Glazing Details: The door utilized 1" thick overall sealed insulating glass. The insulating glass was comprised of two 5/32" thick clear tempered sheets with a Polycarbonate Butyl Composite (P1) 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. The corners of the glazing tape were sealed with silicone.

Test Specimen Description: (Continued)

Drainage:

<u>Description</u>	<u>Quantity</u>	<u>Location</u>
1/2" x 1/8" weepslot	2	1-3/8" from each end in outer sill face for screen track.
1-1/4' x 1/8" weepslot	2	2-3/8" from each end through outer face and first layer of internal webbing.
1" x 3/8" weepslot	2	3/4" from each end through center sill leg and second layer of internal webbing.
3/16" weephole	2	1-3/8" from each end in bottom rail of active panel.

The roller track was notched 1-1/2" x 1/4" from each end.

Hardware:

<u>Description</u>	<u>Quantity</u>	<u>Location</u>
Dual Mortise Lock	1	38-3/4" from bottom rail on jamb stile of active panel secured to the panel with two #10 x 1-1/4" Phillips flat head screws and through the handle with two 10 – 24 x 2" Phillips oval head screws.
Keeper	1	Opposite lock secured through the frame with four #8 x 2-1/2" Phillips pan head screws.
Roller Assembly	2	4" from each end on bottom rail of active panel secured with two #8 x 1/2" Phillips flat head screws.

Test Specimen Description: (Continued)

Reinforcement: Extruded aluminum (SECT9090) was employed at the exterior meeting stile. Extruded aluminum (SECT9091) was employed at the interior meeting stile and jamb stile of active panel.

Screen Construction: All members were constructed of rolled formed aluminum. The corners were mitered and attached with corner keys. The fiberglass mesh cloth was held-in-place using a hollow vinyl spline. A pull handle and four rollers were employed.

Installation: The door was installed into a 2 x 8 test buck constructed of Douglas Fir No. 2 lumber. The mounting 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 mounting fin was sealed to the test buck with silicone.

Test Results: The temperature during testing was 26-29°C (78-85°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*		
	<u>Open</u>		
	Initiate motion	56 N (12.7 lbf)	135 N (30.3 lbf)
	Maintain motion	37 N (8.3 lbf)	90 N (20.2 lbf)
	Latch	12 N (2.7 lbf)	100 N (22.5 lbf)
	<u>Close</u>		
	Initiate motion	62 N (14.0 lbf)	135 N (30.3 lbf)
	Maintain motion	41 N (9.3 lbf)	90 N (20.2 lbf)
	Latch	12 N (2.7 lbf)	100 N (22.5 lbf)
5.3.2.1	Air Leakage Resistance per ASTM E 283*		
	75 Pa (1.57 psf)	0.66 L/s/m ² (0.13 cfm/ft ²)	1.50 L/s/m ² (0.30 cfm/ft ²) max.
<i>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.</i>			
5.3.3.2	Water Penetration Resistance per ASTM E 547* (With and without insect screen)		
	140 Pa (2.92 psf)	No leakage	No leakage
5.3.4.2	Uniform Load Deflection per ASTM E 330		See Note #2

Test Results: (Continued)

<u>Paragraph</u>	<u>Title of Test - Test Method</u>	<u>Results</u>	<u>Allowed</u>
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 842		
	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 A6	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 300		
	Type: A		
	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 G	No entry	No entry
	Test D	No entry	No entry
	Test E	No entry	No entry
	Test F	No entry	No entry
	Test G	No entry	No entry
5.3.6.2	Thermoplastic Corner Weld Test	Meets as stated	Meets as stated

Test Results: (Continued)

<u>Paragraph</u>	<u>Title of Test - Test Method</u>	<u>Results</u>	<u>Allowed</u>
5.3.6.3	Deglazing Test In operating direction - 320 N (71.9 lbf)		
	Jamb Stile	4.0 mm (0.16")	11.4 mm (0.45")
	Meeting Stile	2.8 mm (0.11")	11.4 mm (0.45")
	In remaining direction - 230 N (51.7 lbf)		
	Top Rail	1.8 mm (0.07")	11.4 mm (0.45")
	Bottom Rail	4.3 mm (0.17")	11.4 mm (0.45")

Optional Performance

4.4.2.6	Water Penetration Resistance per ASTM E 547* (With and without insect screen) 150 Pa (3.13 psf)	No leakage	No leakage
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)	68.8 mm (2.71")	See Note #3
	960 Pa (20.05 psf) (negative)	74.3 mm (2.92")	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.*

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)	4.0 mm (0.16")	9.6 mm (0.35") max.
	1440 Pa (30.08 psf) (negative)	8.0 mm (0.32")	9.6 mm (0.35") 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>
Mike Maystadt	MI Windows and Doors, Inc.
Russ Wilkerson	MI Windows and Doors, Inc.
David Douglass	Architectural Testing 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.

Jeffrey T. Osugi
Technician

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 (13)

Revision Log

<u>Rev. #</u>	<u>Date</u>	<u>Page(s)</u>	<u>Revision(s)</u>
0	11/22/10	N/A	Original report issue

Appendix A

Alteration Addendum

Alteration #1: Date-09/22/10
Cause for alteration- Failed structural load test.
Remedial action taken- Reinforcement changed from steel to aluminum.

Appendix B
Test Equipment

Appendix D

Drawings