

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

**Rendered to:**

**MI WINDOWS AND DOORS, INC.**

**SERIES/MODEL: 390FR/EC190**

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

<b>Title</b>	<b>Summary of Results</b>
Primary Product Designator	Class LC-PG30 2438 x 2438 (96 x 96)-SD
Design Pressure	±1440 Pa (30.1 psf)
Operating Force (in motion)	31.1 N (7.0 lbf)
Air Infiltration	0.98 L/s/m <sup>2</sup> (0.19 cfm/ft <sup>2</sup> )
Water Penetration Resistance Test Pressure	220 Pa (4.6 psf)
Uniform Load Structural Test Pressure	±2160 Pa (45.1 psf)
Forced Entry Resistance	Grade 10

**Test Completion Date:** 07/15/10

Reference must be made to Report No. 99055.05-901-44, dated 04/14/11, for complete test specimen description and data.

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

Rendered to:

MI WINDOWS AND DOORS, INC.  
7555 E. State Rt. 69  
Prescott Valley, AZ 86314

Report No.: 99055.05-901-44  
Test Dates: 03/05/10  
Through: 07/15/10  
Report Date: 01/20/11  
Test Record Retention Date: 07/15/14  
Revision 1: 04/14/11

**Project Summary:** Architectural Testing, Inc. was contracted by Mikron Industries, Inc. to perform testing on one Series/Model 1700 PVC Cellulosic Sliding Glass Door (XO) at the test facility of Architectural Testing, Inc. in Kent, Washington. The sample tested successfully met the performance requirements for a Class LC-PG30 2438 x 2438 (96 x 96)-SD rating. This report is a reissue of the original Report No. 99055.01-901-44. This report is reissued in the name of MI Windows and Doors, Inc. through written authorization of Mikron Industries, Inc. Test specimen description and results are reported herein. The samples were 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:** 390FR/EC190

**Product Type:** PVC Cellulosic Sliding Glass Door (XO)

**Overall Size:** 2438 mm (96") wide by 2438 mm (96") high

**Panel Size (2):** 1213 mm (47-3/4") by 2359 mm (92-7/8") high

**Screen Size:** 1194 mm (47") wide by 2400 mm (94-1/2") high

**Overall Area:** 5.94 m<sup>2</sup> (63.9430 ft<sup>2</sup>)

**Finish:** All PVC members were white.

**Test Specimen Description:** (Continued)

**Frame Construction:** The frame was fabricated with cellulosic composite members.

The jamb/head corners were miter cut, bedded in silicone, and fastened with three 4.2 mm by 53 mm (#8 by 2") long screws.

The jamb/cellulosic composite sill corners were coped, butt joined, bedded in silicone, and fastened with three 4.2 mm by 53 mm (#8 by 2") long screws.

The aluminum threshold was set onto the sill in silicone bedding. A PVC riser was set onto the aluminum threshold beneath the fixed panel in a silicone bedding and was secured with three evenly spaced 5 mm by 35 mm (#10 by 1-3/8") screws. A PVC snap cover was installed over the face of the riser. Both the face of the riser and PVC cover were sealed to the aluminum threshold with silicone that also wrapped around the end of the riser at the interlock.

A PVC "baffle" was also applied to the sill/threshold along the full width of the fixed panel and was sealed to the frame sill intermediate leg.

An applied/kerf-mounted nail fin was engaged into an accessory groove at the head, jambs, and sill/threshold.

**Panel Construction:** The fixed and active panels were fabricated with cellulosic composite members. The corners were assembled with coped, notched corners and secured with one #8 by 51 mm (2") screw.

The fixed panel was secured to the frame jamb with four evenly spaced 4.6 mm by 42 mm (#10 by 1-7/8") screws. The exterior face of the bottom rail was sealed to the PVC sill riser with silicone that wrapped around the interlock/meeting stile.

An interlock was attached to the operable panel meeting stile with nine evenly spaced 4 mm by 27 mm (#8 by 1") screws.

An interlock was attached to the fixed panel meeting stile with nine evenly spaced 4 mm by 27 mm (#8 by 1") screws. A snap-in PVC insert was applied over the screws and contained a row of weatherstripping.

**Weatherstripping:**

<u>Description</u>	<u>Quantity</u>	<u>Location</u>
6.1 mm (0.24") high pile with double center fin	2 rows	Head, jambs, both sides of the intermediate leg
5.4 mm (0.21") high pile by 25.4 by 12.5 (1/2" by 1") dust plug	2	Sill, intermediate leg at the jamb and interlock

**Test Specimen Description:**

**Weatherstripping:** (Continued)

<u>Description</u>	<u>Quantity</u>	<u>Location</u>
6.3 mm (0.25") high pile with double center fin	1 row	Fixed panel interlock insert
6.3 mm (0.25") high pile with double center fin	1 row	Fixed panel interlock insert
6.3 mm (0.25") high pile with double center fin	1 row	Operable panel, bottom rail reinforcement

**Glazing Details:** Both operable and fixed panels were exterior glazed, set against a double-sided foam glazing tape, and secured with a cellulosic composite glazing bead. The 21.5 mm (7/8") sealed insulating glass unit was fabricated from two sheets of 4.6 mm (3/16") thick tempered glass separated by an aluminum spacer system.

**Drainage:**

<u>Description</u>	<u>Quantity</u>	<u>Location</u>
7.0 mm by 25.2 mm weep (0.28" by 1.0")	2	Sill, operable panel track insert, end gaps, (draining into panel pocket)
8.0 mm by 22.2 mm weep (0.32" by 0.88")	2	Sill, operable panel track insert, support leg, approx. 95 mm (3-3/4") from the jamb, (draining panel pocket)
6.4 mm by 16.5 mm weep (0.25" by 0.65")	2	Sill, intermediate leg, aligned with panel track insert weep, (draining panel pocket)
6.4 mm by 16.5 mm weep (0.25" by 0.65")	2	Sill, aluminum threshold, upturned leg aligned with panel track insert weep, (draining panel pocket)
7.1 mm by 31.6 mm weep (0.28" by 1.24")	3	Sill, baffle track insert, interior leg, aligned with panel track insert weep and just off the mid-span, (draining panel pocket)
6.3 mm by 22.2 mm weep (0.24" by 0.87")	3	Sill, baffle track insert, middle leg, end cut-out and just off the mid-span, (draining panel pocket)

**Test Specimen Description:**

**Drainage:** (Continued)

<u>Description</u>	<u>Quantity</u>	<u>Location</u>
12.1 mm by 25.4 mm weep (0.48" by 1.0")	3	Sill, baffle track insert, exterior leg, aligned with panel track insert weep and just off the mid-span, (draining panel pocket)
6.4 mm by 19.0 mm weep (0.25" by 0.75")	3	Sill, PVC riser, interior leg, aligned with panel track insert weep and just off the mid-span, (draining panel pocket)
6.4 mm by 38.9 mm weep (0.25" by 1.53")	3	Sill, PVC riser, exterior leg, aligned with panel track insert weep and just off the mid-span, (draining panel pocket)
3.1 mm by 20.8 mm (0.12" by 0.82") weep flapper effective drainage	3	Sill, PVC riser cover, aligned with panel track insert weep and just off the mid-span, (draining panel pocket)

**Hardware:**

<u>Description</u>	<u>Quantity</u>	<u>Location</u>
Metal multi-point lock	1	Panel, jamb stile with lock points 930 mm and 1110 mm (36-1/2" and 43-3/4") from the bottom rail
Metal keeper	1	Jamb, aligned with lock and secured with four 5 mm by 53 mm (#10 by 2") screws
Dual metal adjustable wheels in a metal housing	2	Active panel, bottom rail

**Reinforcement:**

The fixed and operable panel stiles were reinforced with full height aluminum (Reference drawing #9152.1). The reinforcement was secured to the stiles with five evenly spaced 5 mm by 53 mm (#10 by 2") screws per stile.

The operable panel bottom rail was reinforced with aluminum (Reference drawing #9152.1.2). The reinforcement was secured to the rail with three evenly spaced 5 mm by 53 mm (#10 by 2") screws.

**Test Specimen Description:** (Continued)

**Screen Construction:** The aluminum frame was fabricated with mitered corners and fastened with two screws per corner. The top and bottom rail each contained two metal single wheel adjustable rollers in a metal housing. The mesh was held in place with a flexible spline. The screen was temporarily captured at the head for this evaluation.

**Installation:** The specimen was installed into a 2 by 8 wood buck. The applied nail fin was set in urethane and fastened with 4 mm by 25 mm (#8 by 1") panhead screws located approximately 82 mm (3-1/4") apart. The frame jambs were also secured to the test buck with three evenly spaced 5 mm by 50 mm (#10 by 2") screws (located in the panel track). Additionally, all four sides were secured to the buck with seven metal clips. Each clip was secured to the frame member with a single 4.2 mm by 19 mm (#8 by 3/4") screw. Each clip was secured to the test buck with two 4 mm by 25 mm (#8 by 1") screws. The metal clips were located approximately 152 mm (6") from the corners and the remaining were evenly spaced.

**Test Results:** The temperature during testing was 18.8°C (66°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	44.5 N (10.0 lbf)	Report Only
	Maintain motion	31.1 N (7.0 lbf)	90 N (20.0 lbf)
	Locks	9.0 N (2.0 lbf)	100 N (22.5 lbf)
5.3.2.1	Air Leakage Resistance per ASTM E 283		
	75 Pa (1.6 psf)	0.98 L/s/m <sup>2</sup> (0.19 cfm/ft <sup>2</sup> )	1.5 L/s/m <sup>2</sup> (0.3 cfm/ft <sup>2</sup> ) max.

**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.*

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

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

**Test Results:** (Continued)

<u>Paragraph</u>	<u>Title of Test - Test Method</u>	<u>Results</u>	<u>Allowed</u>
5.3.5	Forced Entry Resistance per ASTM F 842 Type: A Disassembly	Grade: 10	
	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
	Hardware Manipulation Test	No entry	No entry
	Panel Manipulation Test	No entry	No entry
5.3.6.3	Deglazing Test In operating direction - 320 N (70 lbf)		
	Lock stile (interior)	1.3 mm (0.05")	8.1 mm (0.32")
	Lock stile (exterior)	1.3 mm (0.05")	8.1 mm (0.32")

Optional Performance

4.3.2.1	Water Penetration Resistance per ASTM E 547 (with and without insect screen) 220 Pa (4.6 psf)	No leakage	No leakage
4.3.2.1	Uniform Load Deflection per ASTM E 330 (Deflections were taken on the meeting stile) (Loads were held for 10 seconds)		
	1440 Pa (30.1 psf) (positive)	59.9 mm (2.32")	See Note #3
	1440 Pa (30.1 psf) (negative)	64.0 mm (2.52")	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)		
	2160 Pa (45.1 psf) (positive)	1.0 mm (0.05")	9.5 mm (0.38") max.
	2160 Pa (45.1 psf) (negative)	0.8 mm (0.04")	9.5 mm (0.38") max.

Tape and film were not used to seal against air leakage during structural testing.

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

This report is reissued in the name of MI Windows and Doors, Inc. through written authorization of Mikron Industries, Inc., to whom the original report was rendered. The original Mikron Industries, Inc. Report No. is 99055.01-901-44.

**List of Official Observers:**

<u>Name</u>	<u>Company</u>
Rob Schrader	Mikron Industries, Inc.
Robert Chappell	Mikron Industries, Inc.
Jeff Dideon	Architectural Testing, Inc.
Jamie Dunning	Architectural Testing, Inc.
Paul Brunner	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 the 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 tested. This report may not be reproduced, except in full, without the written approval of Architectural Testing, Inc.

For ARCHITECTURAL TESTING, INC.

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

Appendix-A: Alteration Addendum (1)

Appendix-B: 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	01/20/11	N/A	Original report issue – Reissue of Report No. 99055.01-901-44 in the name of MI Windows and Doors, Inc.
1	04/14/11	Cover page and Page 1	Changed Series/Model name.

**Appendix A**  
**Alteration Addendum**

*Note: No alterations were required.*

## **Appendix B**

### **Drawings**

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