

**TEST REPORT**

**Report No.:** B2722.02-301-47

**Rendered to:**

MI WINDOWS AND DOORS, INC.  
Prescott Valley, Arizona

**PRODUCT TYPE:** Polyvinyl Chloride (PVC) Single Hung Window  
**SERIES/MODEL:** EC 150 Oriel - Finless

**SPECIFICATIONS:** AAMA/WDMA/CSA 101/I.S.2/A440-08, *NAFS - North American Fenestration Standard/Specification for Windows, Doors, and Skylights*

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

<b>Title</b>	<b>Summary of Results</b>
Primary Product Designator	H - LC30 1216 x 2436 (48 x96)*
Design Pressure	±1800 Pa (±37.59 psf)
Air Infiltration	0.30 L/s/m <sup>2</sup> (0.06 cfm/ft <sup>2</sup> )
Water Penetration Resistance Test Pressure	220 Pa (4.59 psf)

**Test Completion Date:** 10/12/2011

Reference must be made to Report No. B2722.02-301-47 dated 10/28/11 for complete test specimen description and detailed test results. Reference Architectural Testing, Inc. Report No. B2721.01-301-47 dated 10/20/11 for complete *Gateway* test specimen description and test results.

**1.0 Report Issued To:** MI Windows and Doors, Inc.  
7555 East State Route 69  
Prescott Valley, Arizona 86314

**2.0 Test Laboratory:** Architectural Testing, Inc.  
2524 East Jensen Avenue  
Fresno, California 93706  
(559) 233 - 8705

**3.0 Project Summary:**

**3.1 Product Type:** Polyvinyl Chloride (PVC) Single Hung Window

**3.2 Series/Model:** EC 150 Oriel - Finless

**3.3 Compliance Statement:** Results obtained are tested values and were secured by using the designated test methods. The specimen tested successfully met the performance requirements for an **H - LC30 1216 x 2436 (48 x96)\*** rating.

***General Note:** An asterisk (\*) next to the size designation indicates that the size tested for optional performance was smaller than the Gateway test size for the product type and class.*

This product was originally tested as the Mikron Industries, Inc. Series/Model 10200 Single Hung – Finless 48” x 96” Polyvinyl Chloride (PVC) Single Hung Window and is a reissue of the original Report No. B2722.01-301-47. This report is reissued in the name of MI Windows and Doors, Inc. through written authorization by Mikron Industries, Inc.

**3.4 Test Dates:** 08/30/2011 – 10/12/2011

**3.5 Test Location:** MI Windows and Doors, Inc. test facility in Prescott Valley, Arizona. Calibration of test equipment was performed by Architectural Testing in accordance with AAMA 205-01 "In-Plant Testing Guidelines for Manufacturers and Independent Laboratories".

**3.6 Test Sample Source:** The test specimen was provided by the client. Representative samples of the test specimen will be retained by Architectural Testing for a minimum of four years from the test completion date.

**3.7 Drawing Reference:** The test specimen drawings have been reviewed by Architectural Testing and are representative of the test specimens reported herein. Test specimen construction was verified by Architectural Testing per the drawings located in Appendix B. Any deviations are documented herein or on the drawings.

### 3.0 Project Summary:

#### 3.8 List of Official Observers:

<u>Name</u>	<u>Company</u>
Mike Maystadt	MI Windows and Doors, Inc.
Wayne Battram	MI Windows and Doors, Inc.
Rob Schrader	Mikron Industries, Inc.
Jeffrey T. Osugi	Architectural Testing, Inc.
David Douglass	Architectural Testing, Inc.

### 4.0 Test Specifications:

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

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

### 5.0 Test Specimen Description:

#### 5.1 Product Sizes:

Overall Area: 2.96 m <sup>2</sup> (31.88 ft <sup>2</sup> )	Width		Height	
	millimeters	inches	millimeters	inches
Overall size	1216	47-7/8	2436	95-7/8
Interior sash	1150	45-1/4	911	35-7/8
Screen	1138	44-13/16	856	33-11/16

#### 5.2 Frame Construction:

Frame Member	Material	Description
Head, sill and jambs	PVC	Two internal hollows were filled with Aircell foam.
Exterior meeting rail	PVC	

	Joinery Type	Detail
Head, sill and jambs	Mitered	Fully welded.
Exterior meeting rail	Coped	Secured at each end through the frame with #8 x 3" Phillips flat head screws. The screw heads were sealed with silicone.

## 5.0 Test Specimen Description: (Continued)

### 5.3 Sash Construction:

Sash Member	Material	Description
Top rail, bottom rail, each stile	PVC	The interlock was held back 1-1/4" from each end and 2" for the lock. A 0.070" lip was utilized under each lock.

	Joinery Type	Detail
All corners	Mitered	Fully welded.

### 5.4 Weatherstripping:

Description	Quantity	Location
Wrapped foam hollow bulb gasket	1 Row	Interior and exterior meeting rails.
0.260" high polypile with triple center fin	1 Row	All members of frame. Each stile and bottom rail of interior sash.
0.450" high polypile	1 Row	Interior meeting rail.

### 5.5 Glazing:

Glass Type	Spacer Type	Interior Lite	Exterior Lite	Glazing Method
3/4" IG	Polycarbonate - butyl composite	1/8" Annealed	1/8" Annealed	Exterior glazed onto a 3/8" wide x 1/16" high glazing tape and secured with a PVC snap in glazing bead. The corners of the glazing tape were sealed with silicone.

Location	Quantity	Daylight Opening		Glass Bite
		millimeters	inches	
Fixed light	1	1112 x 1445	43-3/4 x 56-7/8	1/2 - 3/8"
Sash	1	1062 x 823	41-13/16 x 32-3/8	1/2"

## 5.0 Test Specimen Description: (Continued)

### 5.6 Drainage:

Drainage Method	Size	Quantity	Location
Weephole with cover	1-1/2" x 3/8" (1-1/16" x 3/16" effective)	2	3" from each end through exterior sill face.
Weephole	1-1/8" x 3/16" Oval	2	1-1/2" from each end through center sill leg.
Weephole	3/8" x 3/16"	2	Each end through first layer of horizontal internal webbing.
Weephole	1-1/2" x 1/4" Oval	2	Each end through first layer of vertical internal webbing.
Weephole	1/2" x 1/8" Oval	4	1/4" from each end through bottom rail of interior sash. 2-5/8" from each end through snap in glazing bead track on bottom rail of interior sash.

### 5.7 Hardware:

Description	Quantity	Location
Cam lock	2	5" from each end on interior meeting rail secured with two #6 x 1" Phillips flat head self drilling screws into reinforcement.
Keeper	2	Opposite lock on exterior meeting rail secured with two #6 x 1" Phillips flat head self drilling screws into reinforcement.
Block and tackle balance	2	Each jamb
Balance shoe	2	Top of each stile secured with two #8 x 1/2" Phillips pan head screws.

### 5.8 Reinforcement:

Drawing Number	Location	Material
M-9265	Exterior meeting rail	Aluminum
M-9264	Interior meeting rail	Aluminum

**5.0 Test Specimen Description: (Continued)**

**5.9 Screen Construction:**

Frame Material	Corner Construction	Mesh Type	Mesh Attachment Method
Roll formed aluminum	Square cut with corner key	Fiberglass	Hollow spline

**6.0 Installation:**

The specimen was installed into a Spruce-Pine-Fir wood buck. The rough opening allowed for a 1/8" shim space. The exterior perimeter of the window was sealed with silicone.

Location	Anchor Description	Anchor Location
Head and jambs	#8 x 1-1/2" Phillips pan head screws	4" from each end and 12 - 14" on center through the frame. The screw clearance holes were sealed with PVC caps.

**7.0 Test Results:** The temperature during testing was 23-25°C (73-77°F). The results are tabulated as follows:

Title of Test	Results	Allowed	Note
<b>Operating Force,</b> per ASTM E 2068	Initiate motion: 115 N (25.8 lbf) Maintain motion: 142 N (32.0 lbf) Locks: 22 N (5.0 lbf)	Report Only.  155 N (34.8 lbf) max.  100 N (22.5 lbf) max.	
<b>Air Leakage,</b> Infiltration per ASTM E 283 at 75 Pa (1.57 psf)	0.30 L/s/m <sup>2</sup> (0.06 cfm/ft <sup>2</sup> )	1.5 L/s/m <sup>2</sup> (0.3 cfm/ft <sup>2</sup> ) max.	1
<b>Water Penetration,</b> per ASTM E 547	N/A	N/A	3

**7.0 Test Results:** (Continued)

Title of Test	Results	Allowed	Note
<b>Uniform Load Deflection,</b> per ASTM E 330 taken at meeting rail +1200 Pa (+25.06 psf) -1200 Pa (-25.06 psf)	9.0 mm (0.35") 8.3 mm (0.33")	Report Only	4,5,6
<b>Uniform Load Structural,</b> per ASTM E 330 taken at meeting rail +1800 Pa (+37.59 psf) -1800 Pa (-37.59 psf)	0.5 mm (0.02") 0.5 mm (0.02")	4.5 mm (0.18") max.	5,6
<b>Forced Entry Resistance,</b> per ASTM F 588, Type: A - Grade: 10	Pass	No entry	
<b>Forced Entry Resistance,</b> per CAWM 301, Type: I	Pass	No entry	
<b>Thermoplastic Corner Weld</b>	Pass	Meets as stated	
<b>Deglazing,</b> per ASTM E 987 Operating direction, 320 N (71.9 lbf) Remaining direction, 230 N (51.7 lbf)	Pass Pass	Meets as stated Meets as stated	
<b>Optional Performance</b>			
<b>Water Penetration,</b> per ASTM E 547 at 220 Pa (4.59 psf)	Pass	No leakage	2
<b>Uniform Load Deflection,</b> per ASTM E 330 taken at meeting rail +1800 Pa (+37.59 psf) -1800 Pa (-37.59 psf)	14.0 mm (0.55") 12.5 mm (0.49")	Report Only	4,5,6
<b>Uniform Load Structural,</b> per ASTM E 330 taken at meeting rail +2520 Pa (+52.63 psf) -2520 Pa (-52.63 psf)	0.5 mm (0.02") 0.5 mm (0.02")	4.5 mm (0.18") max.	5,6

## 7.0 Test Results: (Continued)

*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.*

*Note 2: With and without insect screen.*

*Note 3: The client opted to start at a pressure higher than the minimum required. Test results are reported under Optional Performance.*

*Note 4: 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.*

*Note 5: Loads were held for 10 seconds.*

*Note 6: 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.*



This report is reissued in the name of MI Windows and Doors, Inc. through written authorization by Mikron Industries, Inc. to whom the original report was rendered. The original Mikron Industries, Inc. Report No. is B2722.01-301-47.

The service life of this report will expire on the stated Test Record Retention End Date, at which time such materials as drawings, data sheets, samples of test specimens, copies of this report, and any other pertinent project documentation, shall be discarded without notice.

If test specimen contains glazing, no conclusions of any kind regarding the adequacy or inadequacy of the glass in any glazed test specimen(s) 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.

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Jeffrey T. Osugi  
Technician

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Leaton Kirk  
Director – Regional Operations

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

Appendix-A: Alteration Addendum (1)

Appendix-B: Drawings (14) Complete drawings packet on file with Architectural Testing, Inc.

## Appendix A

### Alteration Addendum

**Alteration #1:** Date - 09/22/11  
Cause for alteration - Failed water penetration test.  
Remedial action taken - Sealed crack in frame. Replaced defective weep cover. Cleaned weeps. Extended internal webbing weephole approximately 1". Re leveled frame. Sealed screen track weepholes.



Test Report No.: B2722.02-301-47  
Report Date: 10/28/11  
Test Record Retention End Date: 10/12/15

## **Appendix B**

### **Drawings**

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