

TEST REPORT

AAMA/WDMA/CSA 101/I.S.2/A440-17

REPORT No.: 1724.02-106-12

RENDERED TO: MI WINDOWS AND DOORS
Gratz, Pennsylvania

PRODUCT TYPE: PVC Outswing Casement Window

SERIES / MODEL: EC 147

Test	Summary of Results
Primary Product Designator	Class CW – PG50 1054 x 1816 (42 x 72)-C
Design Pressure	±2400 Pa (±50.13 psf)
Air Infiltration	0.07 L/s/m ² (0.14 cfm/ft ²)
Water Penetration Resistance Test Pressure	580 Pa (12.12 psf)

Test Completion Date: 10/24/2018

Reference must be made to Report No. 1724.02-106-12, dated 2/21/2019 for complete test specimen description and detailed test results.

CLIENT INFORMATION: MI WINDOWS AND DOORS
650 W Market Street
Gratz, Pennsylvania 17030

TEST LABORATORY: Molimo, LLC
1410 Eden Road
York, Pennsylvania 17402
717-900-6034

PROJECT SUMMARY:

PRODUCT TYPE: PVC Outswing Casement Window

SERIES/MODEL: EC 147

This product also labeled under the following names: HM147, EC147MULL and HM147MULL.

PROJECT SUMMARY:

Molimo, LLC was contracted to perform testing on the above referenced product. The results are tested values and were secured by using the designated test method. A summary of the rating achieved for the specimen tested are shown in the table below.

SPECIMEN	SPECIFICATION	PRODUCT RATING
1	101/I.S.2/A440-17	Class CW – PG50 1054 x 1816 (42 x 72)-C

PROJECT DETAILS:

Test Dates: 10/23/2018 – 10/24/2018

Test Record Retention End Date: 10/24/2022

Test Location: MI windows and doors test facility in Gratz, Pennsylvania. In accordance with AAMA 205.01, calibration of manufacturers' test equipment is documented under Report No. 1724.01-106-12.

Test Specimen Source: The test specimen was provided by the client. Representative samples of the test specimen will be retained by Molimo for a minimum of four years from the test completion date.

Drawing Reference: The test specimen drawings were supplied by the client. The test specimen construction was verified by Molimo and was found to be representative of the product tested. The complete drawing packet of test specimen drawings are on file with Molimo, LLC.

WITNESSES:

The following representatives witnessed all or part of the testing.

Name	Company
Richie Williard	MI Windows and Doors
Michael D. Stremmel, P.E.	Molimo, LLC
Chad C. Pickard	Molimo, LLC

TEST METHOD:

AAMA/WDMA/CSA 101/I.S.2/A440-17, *NAFS 2017 - North American Fenestration Standard/Specification for Windows, Doors, and Skylights*

TEST SPECIMEN DESCRIPTION:**PRODUCT SIZES:**

Overall Size: 1054 mm x 1816 mm (41-1/2" x 71-1/2")
Overall Area: 1.91 m² (20.61 ft²)
Vent: 1003 mm x 1765 mm (39-1/2" x 69-1/2")

FRAME CONSTRUCTION:

Material: Extruded PVC
Corner Details: Miter-cut and thermally welded

VENT CONSTRUCTION:

Material: Extruded PVC
Corner Details: Miter-cut and thermally welded

REINFORCEMENT: No reinforcement was utilized.

TEST SPECIMEN DESCRIPTION: (Continued)

GLAZING DETAILS: *No conclusions of any kind regarding the adequacy or inadequacy of the glass in any glazed test specimen can be made.*

Description	Detail
Glass Type	3/4" IG
Glazing Construction (exterior to interior)	1/8" thick annealed glass 1/2" "U" shaped steel spacer system 1/8" thick annealed glass
Glazing Method	Set from the exterior against a double-sided adhesive backed foam glazing tape and secured with snap-in PVC glazing beads.
Glazing Bite	1/2"
Daylight Opening Vent:	876 mm x 1638 mm (34-1/2" x 64-1/2")

WEATHERSTRIPPING:

Description	Quantity	Location
0.310" high polypile with centerfin	1 Row	Vent stiles and rails
0.220" diameter foam-filled vinyl bulb gasket	2 Rows	Head, sill and jambs of the vent opening

DRAINAGE:

Description	Quantity	Location
1/2" wide x 1/8" high weepslot	2	Vent bottom rail, 4-1/2" from each end, draining the glazing pocket to the vent hollow below
7/8" wide x 3/16" high weepslot with cover	2	Vent bottom rail, 2-1/2" from each end, draining the exterior vent hollow

TEST SPECIMEN DESCRIPTION: (Continued)

HARDWARE:

Description	Quantity	Location
Rotary Handle	1	Sill, 8-1/4" from the hinge jamb
Single bar hinge	2	Vent top and bottom rails at the hinge jamb
Multi-point lock system with handle	1	Vent lock stile with handle located 8-3/4" from the bottom rail and 4 lock points located 3-1/2" from the sill and spaced 19-1/2" on center thereafter
Metal snubbers	5 sets	Vent hinge stile, located 7" from the sill spaced 14" on center thereafter

INSTALLATION: The specimen was installed into a Southern Yellow Pine wood buck. The rough opening allowed for a 1/8" shim space. The exterior perimeter of the specimen was sealed with sealant.

Location	Anchor Description	Anchor Spacing
Head, sill and jambs	#6 x 1-5/8" wood screws	Located 5-5/8" from each corner and spaced 8" on center, through the mounting fin into the wood buck

TEST RESULTS: The temperature during testing was 21°C (69°F).

OPERATING FORCE: (per ASTM E 2068)

Test	Results	Allowable
Initiate Motion	9 N (2.0 lbf)	Report Only
Maintain Motion (Opening)	9 N (2.0 lbf)	45 N (10.12 lbf)
Maintain Motion (Closing)	9 N (2.0 lbf)	45 N (10.12 lbf)
Locks / Latches	22 N (5.0 lbf)	100 N (22.5 lbf)

Note 1: The operating force results listed above represent the maximum force measured among all sash tested.

AIR LEAKAGE TESTING: (per ASTM E 283)

Test	Results	Allowable
Infiltration @ 75 Pa (1.57 psf)	0.07 L/s/m ² (0.14 cfm/ft ²)	1.5 L/s/m ² (0.30 cfm/ft ²)

Note 2: The specimen tested meets (or exceeds) the performance levels specified in AAMA/WDMA/CSA 101/I.S.2/A440 for air leakage resistance.

WATER PENETRATION TESTING: (per ASTM E 331)

Test	Results	Allowable
580 Pa (12.12 psf)	Pass	No Leakage

Note 3: Water Penetration testing was performed without an insect screen.

TEST RESULTS: (Continued)

UNIFORM LOAD TESTING: (per ASTM E 330)

Design Pressure Test	Results	Allowable
Deflection measured at the vent lock stile +2400 Pa (+50.13 psf) -2400 Pa (-50.13 psf)	2.0 mm (0.08") 1.8 mm (0.07")	2.8 mm (0.11") 2.8 mm (0.11")

Structural Test	Results	Allowable
Permanent Set measured at the vent lock stile +3600 Pa (+75.19 psf) -3600 Pa (-75.19 psf)	<0.1 mm (<0.01") <0.1 mm (<0.01")	1.5 mm (0.06") 1.5 mm (0.06")

Note 4: The deflections reported are not limited by AAMA/WDMA/CSA 101/I.S.2/A440-17 for this product designation and is recorded for information purposes only.

Note 5: All loads were held for 10 seconds.

Note 6: Tape and film were used to seal against air leakage. In our opinion, the tape and film did not influence the results of the test.

SECONDARY TESTING:

Test	Results	Allowable
FORCED ENTRY RESISTANCE per ASTM F 588 Type: B – Grade: 10	Pass	No Entry
THERMOPLASTIC CORNER WELD	Pass	Meets as stated
SASH VERTICAL DEFLECTION 270 N (60 lbf)	1.0 mm (0.04")	1.0 mm (0.04")
CASEMENT HARDWARE LOAD TEST 300 Pa (6.27 psf)	Pass	No Damage

General Note: All testing was performed in accordance with reference test methods.

A copy of this report, detailed drawings, datasheets, representative samples of test specimens, or other pertinent project documentation will be retained by Molimo, LLC for the entire test record retention period. At the end of this retention period, the service life of this report will expire.

Results obtained are tested values and were secured by using the designated test methods. This test 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 permission of Molimo, LLC.

For MOLIMO, LLC:

Chad C. Pickard
Technician

Michael D. Stremmel, P.E.
Senior Project Engineer

MDS:jld

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

Appendix-A: Alteration Addendum (1)

Appendix-B: Air Seal Location (1)

Appendix-C: Photographs (1)

Appendix-D: Drawings (Complete drawings packet on file with Molimo, LLC)

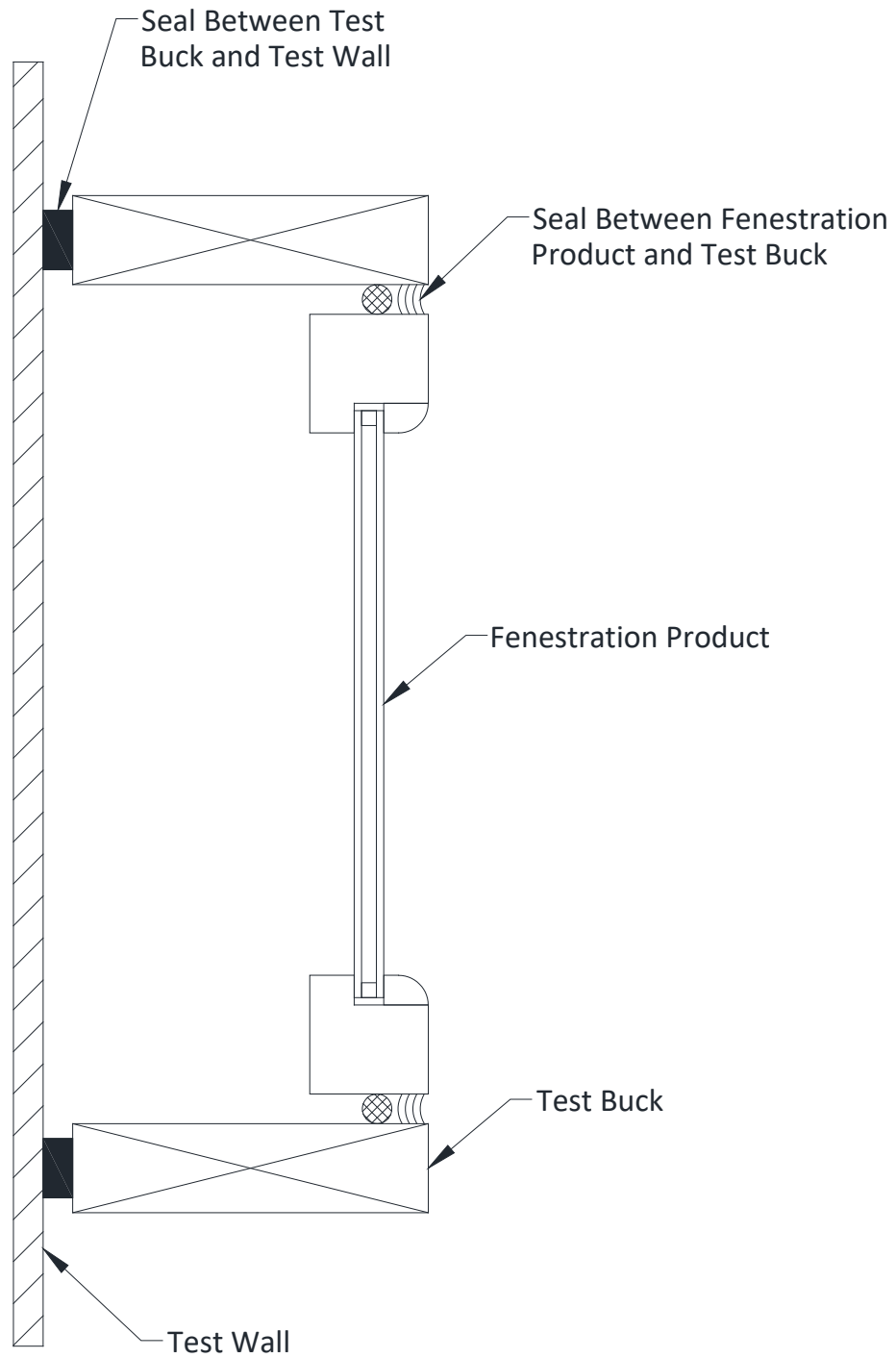
Appendix A

Alteration Addendum

No alterations were performed.

Appendix B

Air Seal Location



Appendix C
Photographs



Photo 1
Specimen #1

Appendix D

Drawings

(Complete drawing packet on file with Molimo, LLC.)