



TEST REPORT

Report No.: F1359.01-501-47

Rendered to:

VEKA INC.
Fombell, Pennsylvania

PRODUCT TYPE: PVC Double Hung Window
SERIES/MODEL: DHA4WW

SPECIFICATION(S): AAMA/WDMA/CSA 101/I.S.2/A440-11, *NAFS 2011 - North American Fenestration Standard/Specification for Windows, Doors, and Skylights*

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

Title	Summary of Results
AAMA/WDMA/CSA 101/I.S.2/A440-08 and -11	Class LC-PG50 1118 x 1930 (44 x 76) - H
Design Pressure	±2400 Pa (±50.13 psf)
Air Infiltration	0.7 L/s/m ² (0.13 cfm/ft ²)
Canadian Air Infiltration/Exfiltration Level	A2
Water Penetration Resistance Test Pressure	360 Pa (7.52 psf)

Test Completion Date: 09/15/15

Reference must be made to Report No. F1359.01-501-47, dated 09/30/15 for complete test specimen description and detailed test results.



1.0 Report Issued To: Veka Inc.
100 Veka Drive
Fombell, Pennsylvania 16123-0250

2.0 Test Laboratory: Architectural Testing, Inc., a subsidiary of Intertek (Intertek-ATI)
1140 Lincoln Avenue
Springdale, Pennsylvania 15144
724-275-7100

3.0 Project Summary:

3.1 Product Type: PVC Double Hung Window

3.2 Series/Model: DHA4WW

3.3 Compliance Statement: Results obtained are tested values and were secured by using the designated test method(s). The specimen tested successfully met the performance requirements for a **Class R-PG50 1118 x 1930 (44 x 76) - H** rating.

3.4 Test Dates: 09/14/15 - 09/15/15

3.5 Test Record Retention End Date: All test records for this report will be retained until September 15, 2019.

3.6 Test Location: Veka Inc. test facility in Fombell, Pennsylvania. Calibration of test equipment was performed by Intertek-ATI in accordance with AAMA 205-01 "In-Plant Testing Guidelines for Manufacturers and Independent Laboratories".

3.7 Test Specimen Source: The test specimen was provided by the client. Representative samples of the test specimen(s) will be retained by Architectural Testing for a minimum of four years from the test completion date.

3.8 Drawing Reference: The test specimen drawings have been reviewed by Intertek-ATI and are representative of the test specimen(s) reported herein. Test specimen construction was verified by Intertek-ATI per the drawings located in Appendix C. Any deviations are documented herein or on the drawings.

3.9 List of Official Observers:

<u>Name</u>	<u>Company</u>
Doug Merry	Veka Inc.
Cornell Charles	Veka Inc.
Joe Allison	Intertek-ATI

4.0 Test Specification(s):

AAMA/WDMA/CSA 101/I.S.2/A440-11, *NAFS 2011 - North American Fenestration Standard/Specification for Windows, Doors, and Skylights*

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

5.0 Test Specimen Description:

5.1 Product Sizes:

Overall Area: 2.2 m ² (24.0 ft ²)	Width		Height	
	millimeters	inches	millimeters	inches
Overall size	1118	44	1930	76
Exterior sash size	1032	40-5/8	940	37
Interior sash size	1057	41-5/8	965	38
Screen size	1026	40-3/8	959	37-3/4

5.2 Frame Construction:

Frame Member	Material	Description
Head, sill, and jambs	PVC	Extruded

	Joinery Type	Detail
All corners	Mitered	Thermally welded

5.3 Sash Construction:

Sash Member	Material	Description
All rails and stiles	PVC	Extruded

	Joinery Type	Detail
All corners	Mitered	Thermally welded

5.0 Test Specimen Description: (Continued)

5.4 Weatherstripping:

Description	Quantity	Location
0.187" backed by 0.270" high center fin pile	1 Row	Sill, lock rail, head
0.187" backed by 0.270" high center fin pile	2 Rows	Exterior meeting rail, top rail (exterior)
0.187" backed by 0.270" high center fin pile	3 Rows	Stiles, top rail
0.187" backed by 0.450" high foam filled vinyl bulb	1 Row	Exterior meeting rail
0.187" by 0.450" vinyl jacket / foam-filled bulb with fin and 90° offset base	1 Row	Bottom rail

5.5 Glazing: *No conclusions of any kind regarding the adequacy or inadequacy of the glass in any glazed test specimen(s) can be made.*

Glass Type	Spacer Type	Interior Lite	Exterior Lite	Glazing Method
1" IG	Rectangular shaped steel, single sealed	1/8" annealed	1/8" annealed	The glass was set from the exterior against a double-sided adhesive tape and secured with rigid vinyl glazing beads.

Location	Quantity	Daylight Opening		Glass Bite
		millimeters	inches	
Exterior sash	1	962 x 876	37-7/8 x 34-1/2	1/2"
Interior sash	1	962 x 876	37-7/8 x 34-1/2	1/2"

5.6 Drainage: No drainage was utilized.

Drainage Method	Size	Quantity	Location
Weepslot with flap	1-1/4" wide by 5/16" high	2	Exterior sill face, one 3" from each end
Weepslot	1" wide by 3/16" high	4	Intermediate sill walls, one at each end of each wall
Weephole	1-1/4" deep by 1/2" wide	2	Sill/jamb intersection, one at each end
Weep notch	1/8" wide by leg height	2	Sill sash retainer leg, one at each end
Weep notch	5/8" wide by leg height	4	Sill screen retainer legs (2), one at each end of each leg

5.0 Test Specimen Description: (Continued)

5.7 Hardware:

Description	Quantity	Location
Locking composite cam lock	2	Lock rail, one 8" from each end with mating keepers on the exterior meeting rail
Constant force balance system	4	Two per jamb
Plastic spring loaded tilt latch	4	Top rail and lock rail, one at each end.
Interlocking metal pivot bar	4	Bottom rail and exterior meeting rail, one at each end
Metal jamb clip	2	Interior jamb track mating with bottom sash tilt latches

5.8 Reinforcement:

Drawing Number	Location	Material
RF SEA745 AOM	Bottom stiles, bottom rail	Extruded aluminum
RF SEA746 AOM	Lock rail	Extruded aluminum
RF SEA434 AOM	Keeper rail	Extruded aluminum
RF SEA435 AOM	Top rail, top stiles	Extruded aluminum

5.9 Screen Construction:

Frame Material	Corner Construction	Mesh Type	Mesh Attachment Method
Formed aluminum	Miter-cut and secured with snap-in plastic corner keys	Fiber	Flexible vinyl 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 a silicone sealant.

Location	Anchor Description	Anchor Location
Jambs	#8 x 2" truss head screw	Five per jamb, one each at the top, bottom, near midspan through metal jamb clip, and 6" above and below midspan.

7.0 Test Results: The temperature during testing was 21°C (70°F). The results are tabulated as follows:

Title of Test	Results	Allowed	Note
Operating Force, per ASTM E 2068	Initiate motion: 89 N (20 lbf) Maintain motion: 80 N (18 lbf) Latches: 44 N (10 lbf) Locks: 44 N (10 lbf)	Report Only 155 N (35 lbf) max. 100 N (22.5 lbf) max. 100 N (22.5 lbf) max.	
Air Leakage, Infiltration per ASTM E 283 at 75 Pa (1.57 psf)	0.7 L/s/m ² (0.13 cfm/ft ²)	1.5 L/s/m ² (0.3 cfm/ft ²) max.	1
Air Leakage, Exfiltration per ASTM E 283 at 75 Pa (1.57 psf)	0.6 L/s/m ² (0.12 cfm/ft ²)	1.5 L/s/m ² (0.3 cfm/ft ²) max.	1
Canadian Air Infiltration/Exfiltration Level	A2	N/A	
Uniform Load Structural, per ASTM E 330	N/A	N/A	3
Forced Entry Resistance, per ASTM F 588, Type: A - Grade: 10	Pass	No entry	
Thermoplastic Corner Weld	Pass	Meets as stated	
Deglazing, per ASTM E 987 Operating direction, 320 N (72 lbf) Remaining direction, 230 N (52 lbf)	Pass Pass	Meets as stated Meets as stated	

7.0 Test Results: (Continued)

Title of Test	Results	Allowed	Note
Optional Performance			
Water Penetration, per ASTM E 547 at 360 Pa (7.52 psf)	Pass	No leakage	2
Uniform Load Deflection, per ASTM E 330 Deflections taken at the exterior meeting rail +2400 Pa (+50.13 psf) -2400 Pa (-50.13 psf)	6.8 mm (0.27") 7.8 mm (0.31")	Report Only	4, 5, 6
Uniform Load Structural, per ASTM E 330 Permanent sets taken at the exterior meeting rail +3600 Pa (+75.19 psf) -3600 Pa (-75.19 psf)	1.5 mm (0.06") 1.0 mm (0.04")	4.1 mm (0.16") max. 4.1 mm (0.16") max.	5, 6

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.



Intertek-ATI will service this report for the entire test record retention period. Test records such as detailed drawings, datasheets, representative samples of test specimens, or other pertinent project documentation, will be retained by Intertek-ATI for the entire test record retention period.

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 Intertek-ATI.

For ARCHITECTURAL TESTING, Inc.

Joseph E. Allison
Senior Technician

Lynn George
Director – Regional Operations

JEA:sld

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

Appendix-A: Alteration Addendum (1)

Appendix-B: Location of Air Seal (1)

Appendix-C: Drawing(s) (2) Complete drawings packet on file with Intertek-ATI.



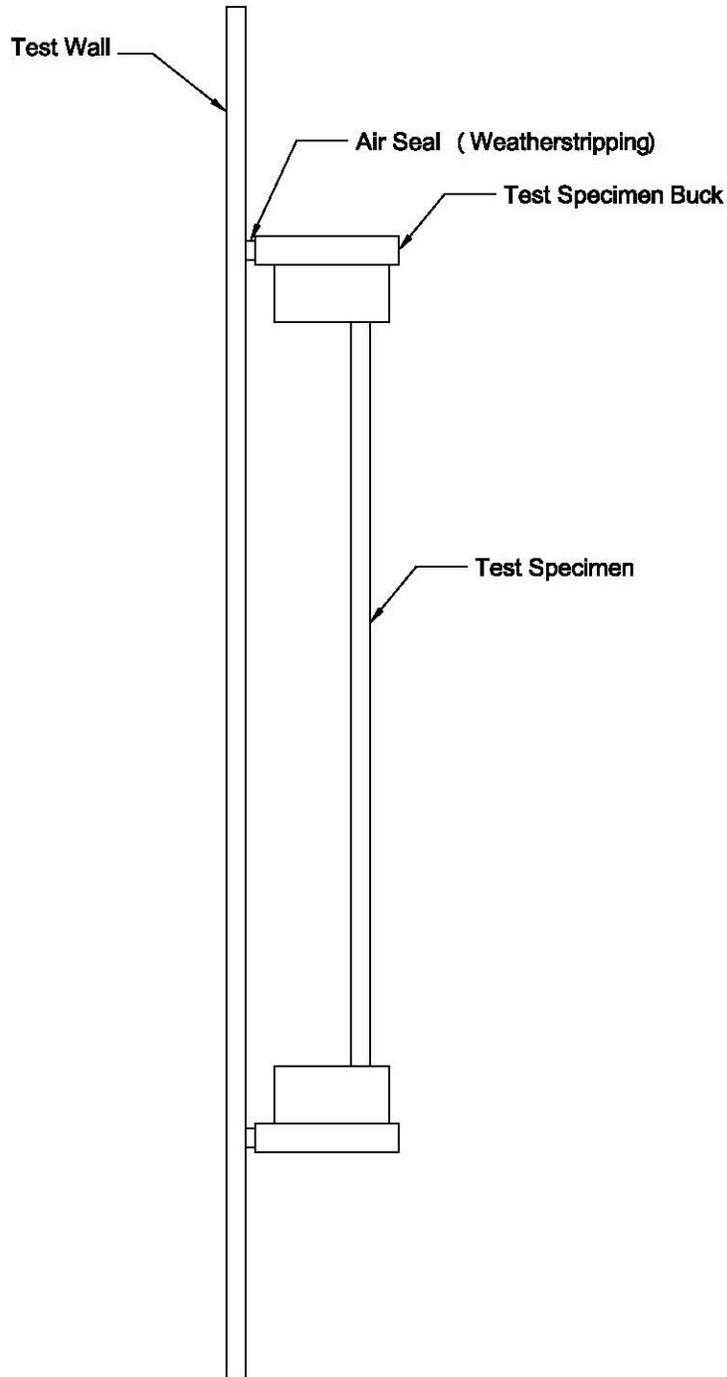
Appendix A

Alteration Addendum

Note: No alterations were required.

Appendix B

Location of Air Seal: The air seal between the test specimen and the test wall is detailed below. The seal is made of foam weatherstripping and is attached to the edge of the test specimen buck. The test specimen buck is placed against the test wall and clamped in place, compressing the weatherstripping and creating a seal.

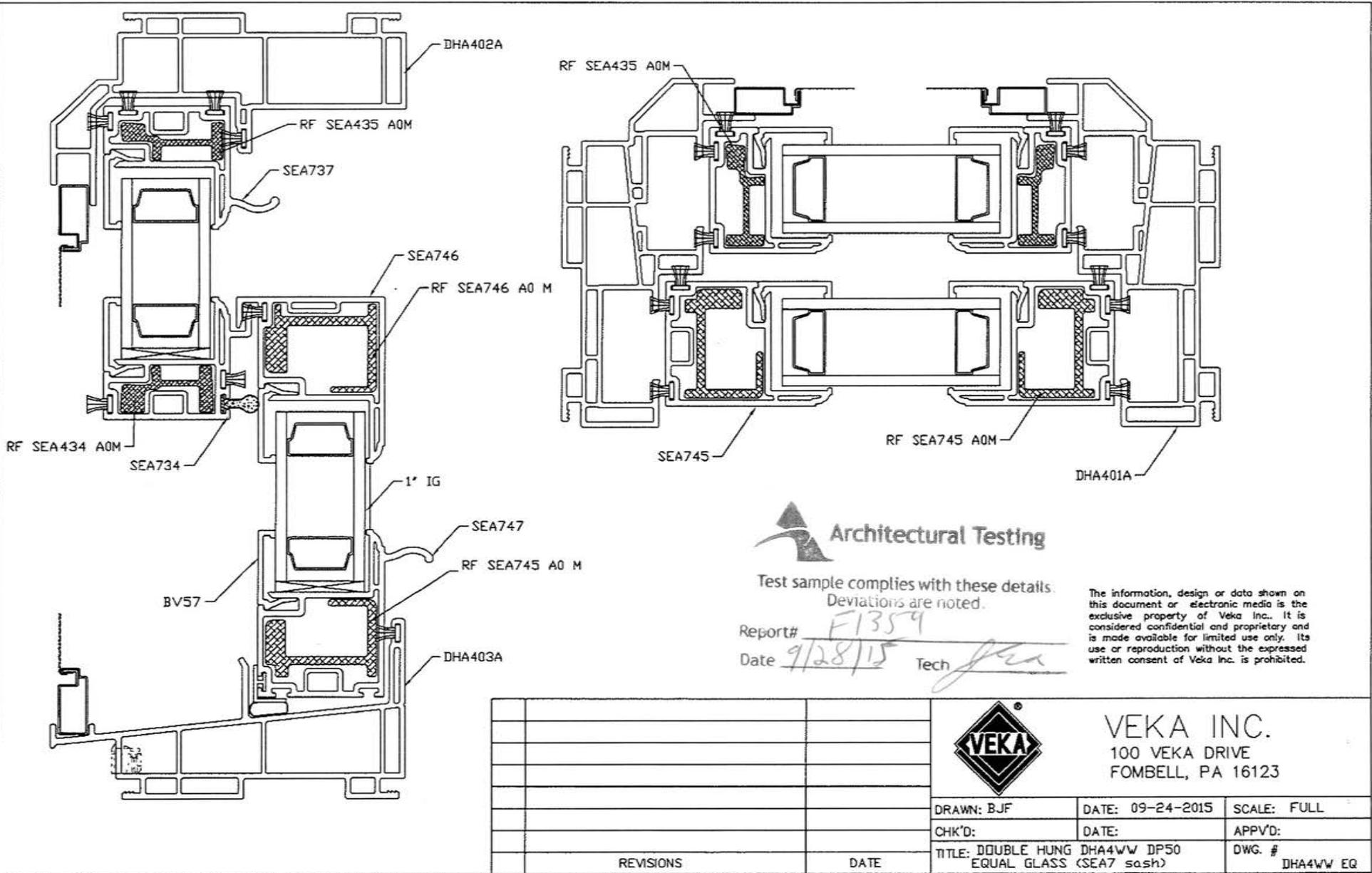




Appendix C

Drawing(s)

Note: *Complete drawings packet on file with Intertek-ATI.*



Test sample complies with these details.
Deviations are noted.

Report# F1359
Date 9/28/15 Tech Jen

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REVISIONS	DATE



VEKA INC.
100 VEKA DRIVE
FOMBELL, PA 16123

DRAWN: BJF	DATE: 09-24-2015	SCALE: FULL
CHK'D:	DATE:	APPV'D:
TITLE: DOUBLE HUNG DHA4WW DP50 EQUAL GLASS (SEA7 sash)		DWG. # DHA4WW EQ