

TEST REPORT

Report No.: A4237.01-109-44

Rendered to:

TUBELITE, INC.
Walker, Michigan

PRODUCT TYPE: Awning Project-In Window
SERIES/MODEL: HW3700

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

Title	Summary of Results
Primary Product Designator	Class CW-PG40 1524 x 914 (60 x 36)-AP
Design Pressure	±1920 Pa (±40.10 psf)
Air Infiltration	<0.1 L/s/m ² (<0.01 cfm/ft ²)
Water Penetration Resistance Test Pressure	290 Pa (6.06 psf)

Test Completion Date: 10/08/2010

Reference must be made to Report No. A4237.01-109-44, dated 11/30/10 for complete test specimen description and detailed test results.

1.0 Report Issued To: Tubelite, Inc.
3056 Walker Ridge Drive NW Suite G
Walker, Michigan 49544
616-301-0056

2.0 Test Laboratory: Architectural Testing, Inc.
130 Derry Court
York, Pennsylvania 17406-8405
717-764-7700

3.0 Project Summary:

3.1 Product Type: Awning Project-In Window

3.2 Series/Model: HW3700

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 CW-PG40 1524 x 914 (60 x 36)-AP** rating.

3.4 Test Dates: 10/07/2010 and 10/08/2010

3.5 Test Location: Architectural Testing, Inc. test facility in York, Pennsylvania.

3.6 Test Sample 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.

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

3.8 List of Official Observers:

<u>Name</u>	<u>Company</u>
Steve Wilkening	Tubelite, Inc.
Rick Via	Wausau Window and Wall Systems
Michael D. Stremmel, P.E.	Architectural Testing, Inc.
Jeremy R. Bender	Architectural Testing, Inc.

4.0 Test Specification:

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: 1.4 m ² (15.0 ft ²)	Width		Height	
	millimeters	inches	millimeters	inches
Overall size	1524	60	914	36
Vent	1505	59-1/4	895	35-1/4

5.2 Frame Construction:

Frame Member	Material	Description
Head, sill, jambs	Aluminum	Poured and debridged thermally improved extruded aluminum
Sill extender	Aluminum	Sill, sealed and secured with #10 x 3/8" long pan head machine screws, located 2-1/2" from corner and spaced 8" on center

	Joinery Type	Detail
All corners	Coped and butted	Sealed with silicone and secured using two #10 x 1-1/2" long pan head screws per corner

5.3 Vent Construction:

Vent Member	Species/Material/ Alloy	Other
Top rail, bottom rail, and stiles	Aluminum	Poured and debridged thermally improved extruded aluminum

	Joinery Type	Detail
All corners	Mitered and keyed	Secured with two corner keys with lanced stakes and sealed with silicone

5.0 Test Specimen Description: (Continued)

5.4 Weatherstripping:

Description	Quantity	Location
Hollow vinyl bulb seal	2 Rows	Perimeter of vent

5.5 Glazing:

Glass Type	Spacer Type	Interior Lite	Exterior Lite	Glazing Method
1" IG	Stainless steel and PVC spacer sealed with butyl	1/4" thick clear tempered	1/4" thick clear tempered	The glass was interior glazed against a bed of butyl and secured with aluminum glazing beads with a rubber gasket against the glass.

Location	Quantity	Daylight Opening	Glass Bite
Vent daylight opening	1	54-1/4" x 30-1/8"	1/2"

5.6 Drainage:

Drainage Method	Size	Quantity	Location
Weephole with cover	1-3/16" wide by 1/2" high	2	5-1/4" from edge of frame on sill face

5.7 Hardware:

Description	Quantity	Location
1/4 turn lever lock with keeper	2	Top rail, 8-1/2" from each jamb
Multi-arm friction hinge	2	Bottom of each jamb

5.8 Reinforcement: No reinforcement was utilized.

6.0 Installation:

The specimen was installed into a Spruce-Pine-Fir wood buck. The rough opening allowed for a 1/16" shim space. The exterior perimeter of the window was sealed with silicone.

Location	Anchor Description	Anchor Location
Head and sill	#8 x 2" long pan head screw	4-1/2" from corners and 12" on center
Jambs		6" from corners and 10-1/2" on center

7.0 Test Results: The temperature during testing was 22°C (71°F). The results are tabulated as follows:

Title of Test	Results	Allowed	Note
Operating Force, per ASTM E 2068	Initiate motion: 33 N (7.5 lbf) Maintain motion: 42 N (9.5 lbf) Locks: 44 N (10 lbf)	Report Only 135 N (30 lbf) 100 N (22.5 lbf)	
Air Leakage, per ASTM E 283 at 75 Pa (1.6 psf)	<0.1 L/s/m ² (<0.01 cfm/ft ²)	1.5 L/s/m ² (0.3 cfm/ft ²) max.	1
Water Penetration, per ASTM E 547	N/A	N/A	3
Uniform Load Deflection, per ASTM E 330	N/A	N/A	3
Uniform Load Structural, per ASTM E 330	N/A	N/A	3
Forced Entry Resistance, per ASTM F 588, Type: B - Grade: 10	No entry	No entry	
Awning, Hopper Projected Hardware Load Test 140 N (30 lbf)	31.8 mm (1.25")	51.6 mm (2.03")	

7.0 Test Results: (Continued)

Title of Test	Results	Allowed	Note
Optional Performance			
Water Penetration, per ASTM E 547 at 290 Pa (6.06 psf)	No leakage	No leakage	2
Uniform Load Deflection, per ASTM E 330 taken at bottom rail +1920 Pa (+40.10 psf) -1920 Pa (-40.10 psf)	4.1 mm (0.16") 2.8 mm (0.11")	8.4 mm (0.33") max. 8.4 mm (0.33") max.	4, 5
Uniform Load Structural, per ASTM E 330 taken at bottom rail +2880 Pa (+60.15 psf) -2880 Pa (-60.15 psf)	0.3 mm (0.01") 0.3 mm (0.01")	4.3 mm (0.17") max. 4.3 mm (0.17") max.	4, 5

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: Without insect screen.

Note 3: The client opted to start at a pressure higher than the minimum required.

Note 4: Loads were held for 10 seconds.

Note 5: 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.

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.

Jeremy R. Bender
Technician

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

JRB:dem

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

Appendix-A: Alteration Addendum (1)

Appendix-B: Photograph (1)

Appendix-C: Drawings (5)

Appendix A
Alteration Addendum

Note: No alterations were required.

Appendix B

Photograph



Photo No. 1
Awning Project-In



Test Report No.: A4237.01-109-44
Report Date: 11/30/10
Test Record Retention End Date: 10/08/14

Appendix C

Drawings



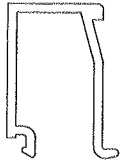
Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report# A4237-01

Date 11-23-10 Tech JB

PARTS LIST



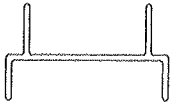
Vent Window Glass Stop

E3702



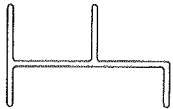
Vent Window Wedge Gasket

P3703



14000 Series Adapter

P3707



200cw/400cw Adapter

P3708



"H" Adapter For Muller Windows

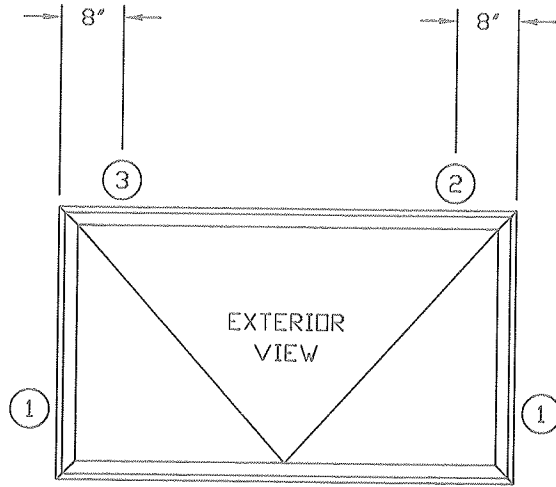
P3703



Butyl Glazing Tape
Tremco Polyshim II or .150" Thick
with 1/8" Shim Equivalent
Not By Tubelite



Glass Setting Block
1/4" x 1" x 4"
Not By Tubelite



THERMAL PERFORMANCE TEST ELEVATION
 HW3700 HOPPER VENT WINDOW



Architectural Testing

Test sample complies with these details.
 Deviations are noted.

Report# A4037-01
 Date 10-14-10 Tech SB

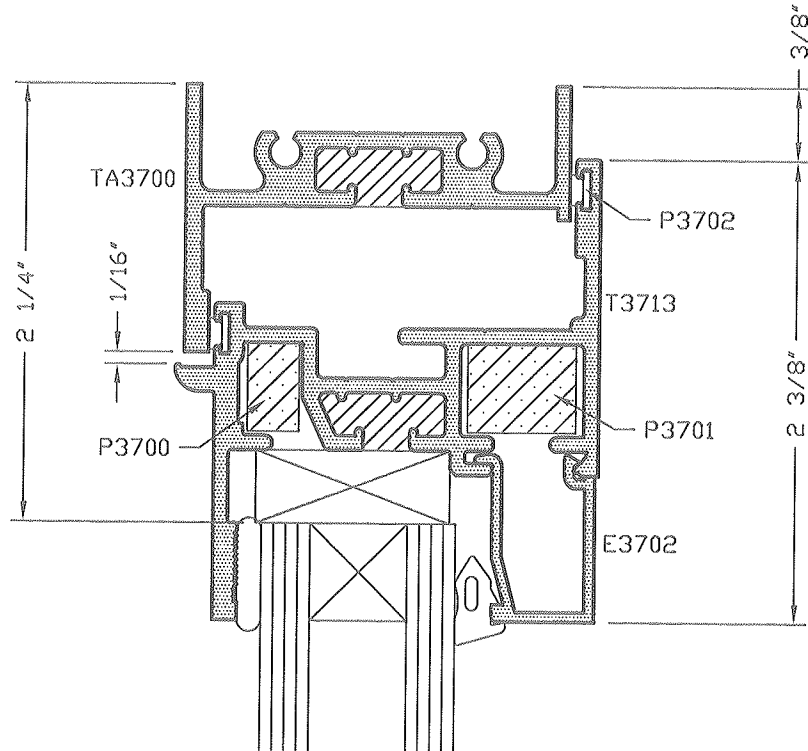
TUBELITE®

STOREFRONT, CURTAINWALL & ENTRANCES

DEPENDABLE

HW3700 HOPPER VENT WINDOW
 THERMAL PERFORMANCE TEST
 ELEVATION

DRAWN BY JEM	DRWG DATE 10/08/10	APPV'D BY	DATE APPV'D	REV
DRWG SCALE 1/2"=1"	PRODUCT CODE 120	T962		



Architectural Testing

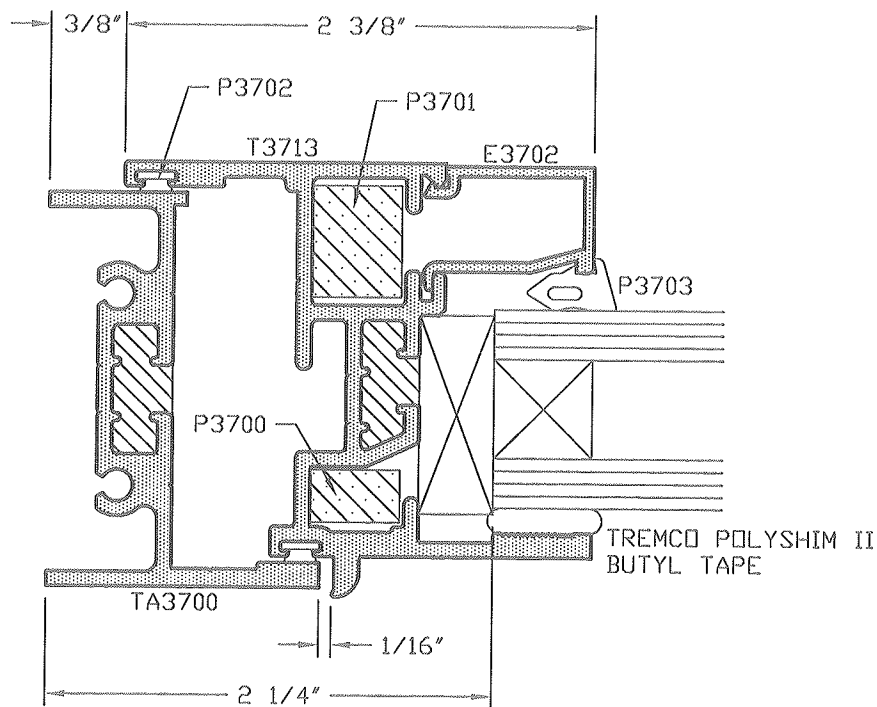
Test sample complies with these details.
Deviations are noted.

Report# A473701
Date 10-14-10 Tech RB

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HW3700 HOPPER VENT WINDOW
THERMAL PERFORMANCE TEST
HEAD DETAIL

DRAWN BY JEM	DRVG DATE 10/08/10	APPV'D BY	DATE APPV'D
DRVG SCALE 1"=1"	PRODUCT CODE 120	T962-1	
			REV



Architectural Testing

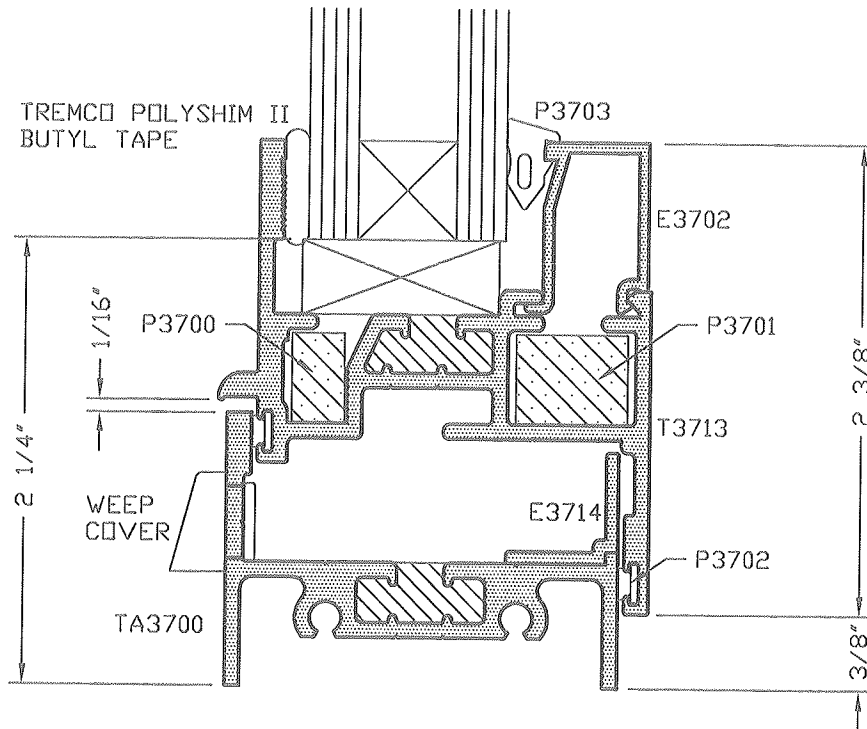
Test sample complies with these details.
Deviations are noted.

Report# A4237-01
Date 10-14-10 Tech RL

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HW3700 HOPPER VENT WINDOW
THERMAL PERFORMANCE TEST
JAMB DETAIL

DRAWN BY JEM	DRWG DATE 10/08/10	APPV'D BY	DATE APPV'D
DRWG SCALE 1"=1"	PRODUCT CODE 120	T962-2	REV



Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report# A4237-01
Date 10-14-10 Tech SB

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HW3700 HOPPER VENT WINDOW
THERMAL PERFORMANCE TEST
SILL DETAIL

DRAWN BY JEM	DRVG DATE 10/08/10	APPV'D BY	DATE APPV'D	REV
DRVG SCALE 1"=1"	PRODUCT CODE 120	T962-3		