Architectural Testing

TEST REPORT

Report No.: A4234.01-109-44

Rendered to:

TUBLITE, INC.
Walker, Michigan

PRODUCT TYPE: Awning Project-Out Window
SERIES/MODEL: VW3700

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-PG75 1524 x 914 (60 x 36)-AP
Design Pressure	±3600 Pa (±75.19 psf)
Air Infiltration	0.1 L/s/m^2 (0.01 cfm/ft^2)
Water Penetration Resistance Test Pressure	580 Pa (12.11 psf)

Test Completion Date: 10/08/2010

Reference must be made to Report No. A4234.01-109-44, 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-Out Window

3.2 Series/Model: VW3700

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-PG75 1524 x 914 (60 x 36)-AP** rating.

3.4 Test Dates: 10/07/2010 - 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:

Name	Company
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(s):

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

AAMA 910-93, *Voluntary "Life Cycle" Specifications and Test Methods for Architectural Grade Windows and Sliding Glass Doors*

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, and jambs	Aluminum	Poured and debridged thermally improved extruded aluminum

	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**
Rails and stiles	Aluminum	Poured and debridged thermally improved extruded aluminum

	Joinery Type	**Detail**
All corners	Mitered and keyed	Keyed and sealed. Corners were 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 snap-in 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: No drainage was utilized.

5.7 Hardware:

Description	Quantity	Location
1/4 turn lever lock with keeper	2	Bottom rail, 8-1/2" from each jamb
Multi-arm friction hinge	2	Top 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 spaced 12" on center
Jambs	#8 x 2" long pan head screw	6" from corners and spaced 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
Life Cycle per AAMA 910			
Operating Force, per ASTM E 2068	Initiate motion: 26 N (5.75 lbf) Maintain motion: 32 N (7.25 lbf) Locks: 22 N (5 lbf)	Report Only 135 N (30 lbf) 100 N (22.5 lbf)	
Air Leakage, Infiltration per ASTM E 283 at 300 Pa (6.2 psf)	0.2 L/s/m² (0.03 cfm/ft²)	0.5 L/s/m² (0.10 cfm/ft²) max.	1
Water Penetration, per ASTM E 547 and ASTM E 331 at 580 Pa (12.11 psf)	Pass	No leakage	2
Sash/Vent Cycling, per AAMA 910 1250 cycles	Vent: No damage	No damage	3
Locking Hardware Cycling, per AAMA 910 1250 cycles	Lock: No damage Lock: No damage	No damage No damage	3 3
Misuse Testing: per AAMA 910			
Ventilator Torsion Test at 222 N (50 lbf)	No damage	No damage	
Balance Arm Load Test at 222 N (50 lbf)	No damage	No damage	
Vent Lateral Racking Test at 222 N (50 lbf)	No damage	No damage	
Sash/Vent Cycling, per AAMA 910 1250 cycles	Vent: No damage	No damage	3

7.0 Test Results: Continued

Title of Test	Results	Allowed	Note
Locking Hardware Cycling, per AAMA 910 1250 cycles	Lock: No damage	No damage	3
	Lock: No damage	No damage	3
Operating Force, per ASTM E 2068	Initiate motion: 26 N (5.75 lbf)	Report Only	
	Maintain motion: 27 N (6.00 lbf)	135 N (30 lbf)	
	Locks: 22 N (5 lbf)	100 N (22.5 lbf)	
Air Leakage, Infiltration per ASTM E 283 at 300 Pa (6.2 psf)	0.3 L/s/m^2 (0.01 cfm/ft^2)	0.5 L/s/m^2 (0.10 cfm/ft^2) max.	1
Water Penetration, per ASTM E 547 and ASTM E 331 at 580 Pa (12.11 psf)	Pass	No leakage	2
Uniform Load Deflection, per ASTM E 330	N/A	N/A	4
Uniform Load Structural, per ASTM E 330	N/A	N/A	4
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)	31.5 mm (1.24")	51.6 mm (2.03")	
Optional Performance			
Uniform Load Deflection, per ASTM E 330 taken at top rail +3600 Pa (+75.19 psf) -3600 Pa (-75.19 psf)	 1.8 mm (0.07") 8.4 mm (0.33")	 8.6 mm (0.34") max. 8.6 mm (0.34") max.	5, 6
Uniform Load Structural, per ASTM E 330 taken at top rail +5400 Pa (+112.78 psf) -5400 Pa (-112.78 psf)	 <0.3 mm (<0.01") <0.3 mm (<0.01")	 3.0 mm (0.12") max. 3.0 mm (0.12") 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: Without insect screen.

Note 3: Observation, minimal wear and tear.

Note 4: The client opted to start at a pressure higher than the minimum required.

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.

Note: *Test specimen met all the requirements for an AW rating with the exception of the Sash Torsion 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.

Digitally Signed by: Jeremy R. Bender

Jeremy R. Bender
Technician

Digitally Signed by: Michael D. Stremmel

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 (8)

Appendix A

Alteration Addendum

***Note**: No alterations were required.*

Appendix B

Photograph

Photo No. 1
Awning Project-Out

Appendix C

Drawings

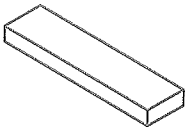
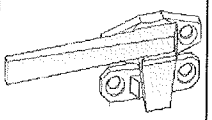
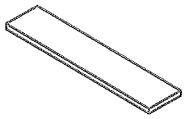
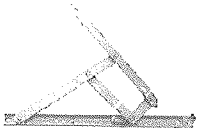
Architectural Testing

Test sample complies with these details.
Deviations are noted.

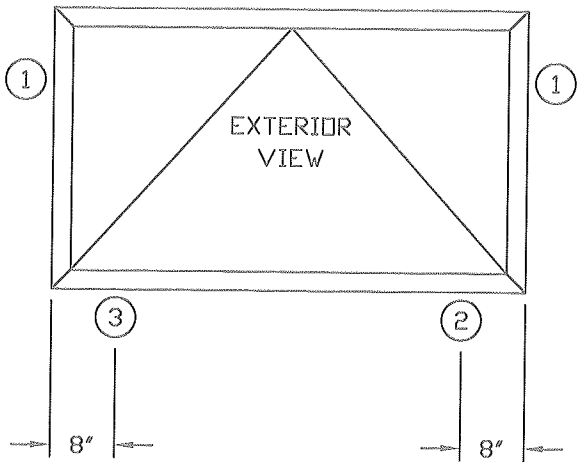
Report# A4234.01

Date 11-23-10 Tech SEB

MATERIALS LIST & PARTS IDENTIFICATION

P1221		WIPER GASKET	N.B.T.		TREMCO POLYSHIM II WITH 1/8" SHIM OR EQUAL
P3702		BULB WEATHERING	N.B.T.		TREMCO SGT921 /NORTON V2100 1/4" x 3/4" GLAZING TAPE
P3703		GLAZING WEDGE	N.B.T.		3/8" x 1" x 4" SETTING BLOCK
P3709L/R		CAM HANDLES	N.B.T.		1/8" x 7/8" x 4" SILICONE SETTING BLOCK
P3713A - F		STAINLESS STL HD 4 BAR HINGE			
P3706		MULL ADAPTER			
P3707		FLUSH GLAZE ADAPTER			
P3708		CURTAINWALL ADAPTER			

T961



THERMAL PERFORMANCE TEST ELEVATION
VW3700 CASEMENT WINDOW

Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report# A4234.01

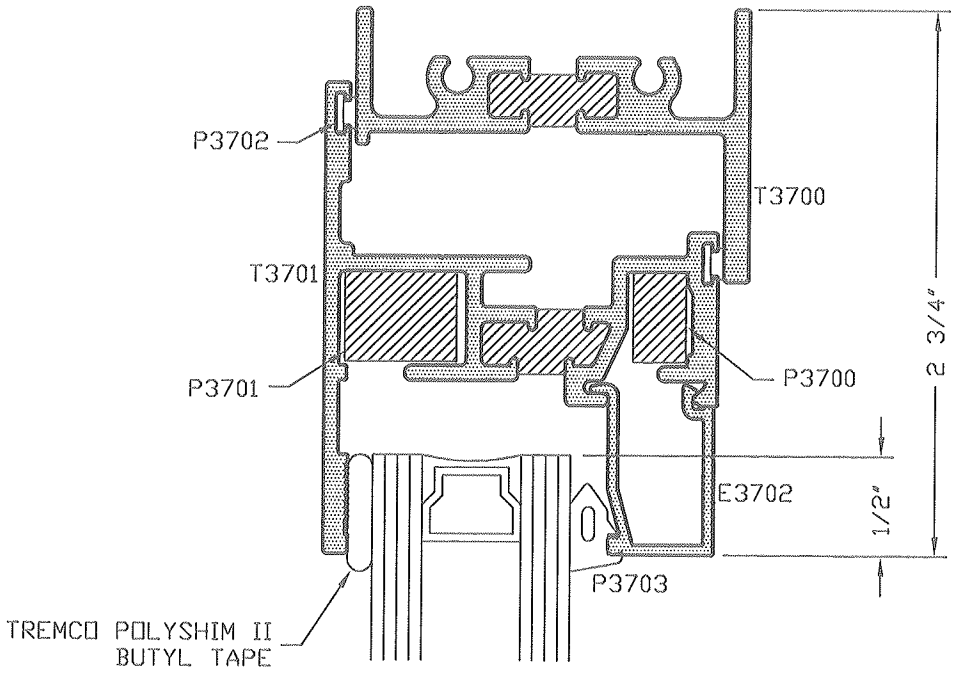
Date 10-14-10 Tech JRB

TUBELITE®
STOREFRONT, CURTAINWALL & ENTRANCES
DEPENDABLE

VW3700 CASEMENT WINDOW
THERMAL PERFORMANCE TEST
ELEVATION

DRAWN BY JEM	DRWG DATE 10/06/10	APPV'D BY	DATE APPV'D
DRWG SCALE 1/2″=1″	PRODUCT CODE 120	T961	REV

T961-1



Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report# A4234.01

Date 12-14-10 Tech JB

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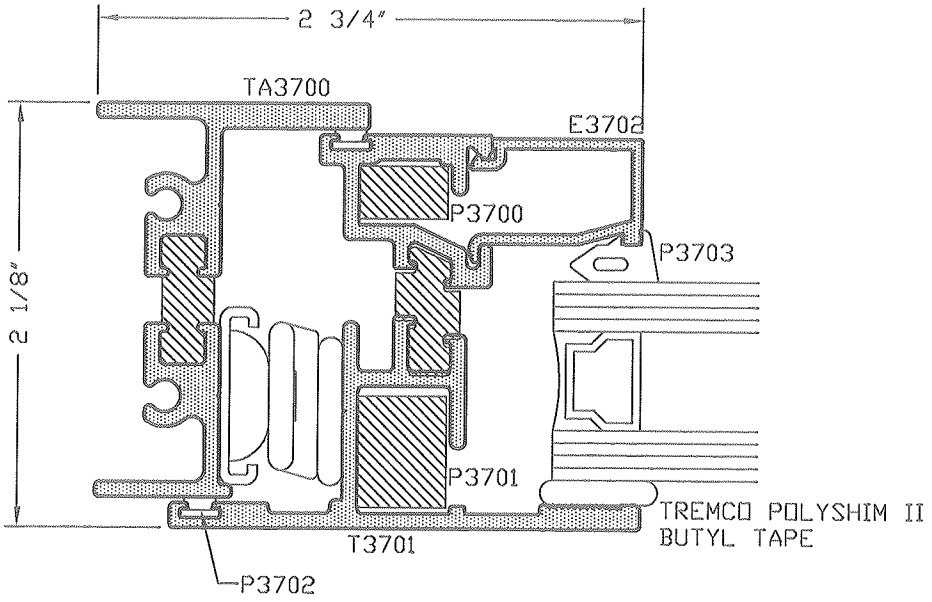
VW3700 CASEMENT WINDOW
THERMAL PERFORMANCE TEST
HEAD DETAIL

DRAWN BY	JEM	DRWG DATE	10/06/10	APPV'D BY		DATE APPV'D	
DRWG SCALE	1"=1"	PRODUCT CODE	120	T961-1			REV

T961-2



Architectural Testing

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Deviations are noted.

Report# A4234.01

Date 10-14-10 Tech JPB

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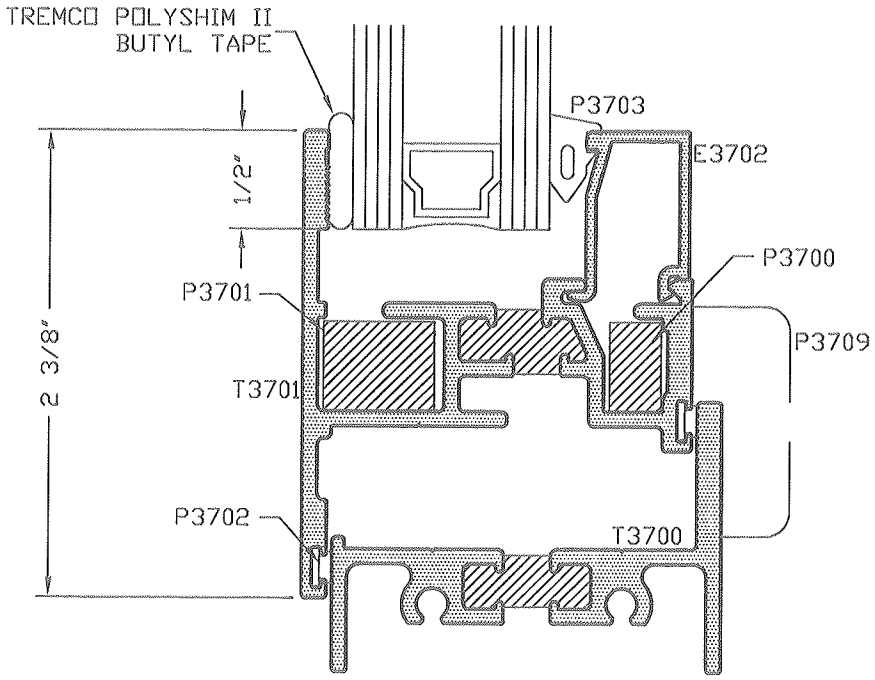
VW3700 CASEMENT WINDOW
THERMAL PERFORMANCE TEST
JAMB DETAIL

DRAWN BY	JEM	DRWG DATE	10/06/10	APPV'D BY		DATE APPV'D	
DRWG SCALE	1"=1"	PRODUCT CODE	120	T961-2			REV

T961-3



Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report# A4234.01

Date 10-14-10 Tech JeB

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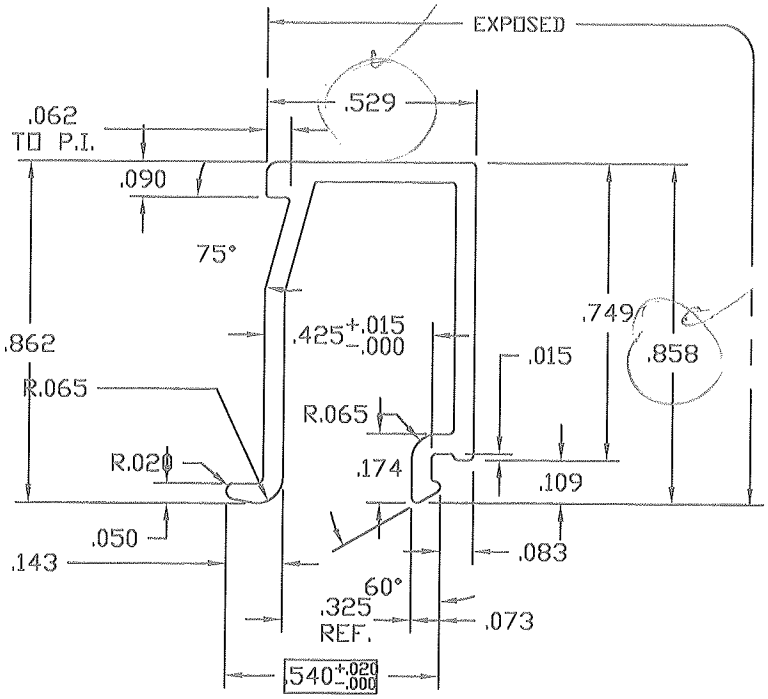
VW3700 CASEMENT WINDOW
THERMAL PERFORMANCE TEST
SILL DETAIL

DRAWN BY	JEM	DRWG DATE	10/06/10	APPV'D BY		DATE APPV'D	
DRWG SCALE	1"=1"	PRODUCT CODE	120	T961-3			REV

E3702



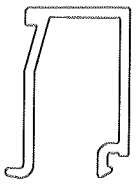
TWO TIMES SCALE

Architectural Testing

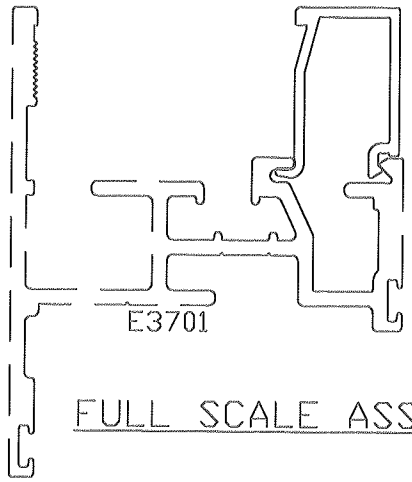
Test sample complies with these details.
Deviations are noted.

Report# A4234.01

Date 10-14-10 Tech JRB



FULL SCALE



FULL SCALE ASSEMBLY

MATES WITH E3701

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ALL UNSPECIFIED RADII .015

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▭ DENOTES CRITICAL DIMENSION

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3056 WALKER RIDGE NW, SUITE G
WALKER, MICHIGAN 49544

REV	DATE	DESCRIPTION	INTL
	08/25/00	RELEASE FOR TOOLING	CRH
	09/15/00	PART NUMBER WAS E9080001	CRH
	02/13/02	PART NUMBER WAS E908A01	SRD

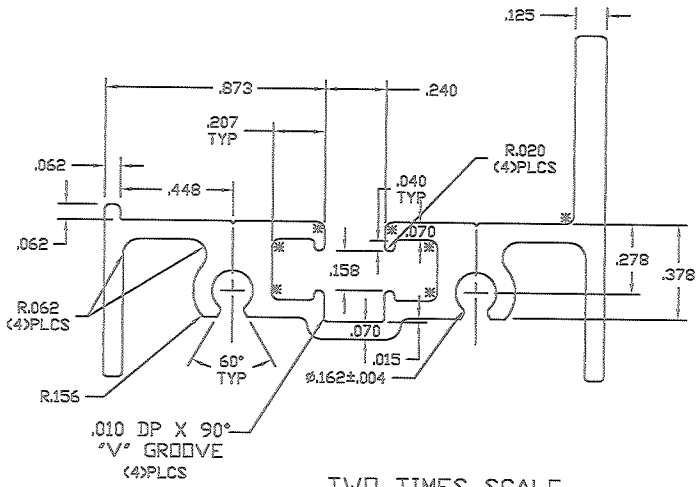
WALL THK. .050	SECTION CLASS S	MAT'L 6063-T5	RATIO 464:1
PERIMETER OUT (TOTAL) 4.737		AREA .119	WGT/FT .140
FACTOR 34	CIRCLE SIZE 1.043		INFILL VOLUME N/A

RXX .215	SXX .020	IXX .006	CXX .351
RYY .286	SYY .026	IYY .010	CYY .490

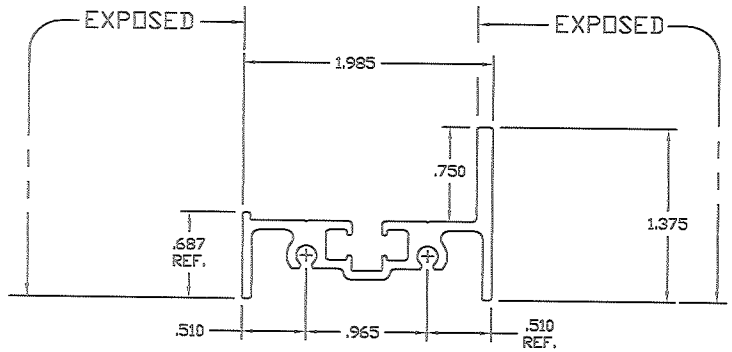
GLASS STOP FOR 1" GLASS VENT WINDOWS

DRAWN BY CRH	DRWG DATE 08/17/00	APPV'D BY	DATE APPV'D
DWG SCALE NOTED	PRODUCT CODE 120	E3702	REV

E3700 A



TWO TIMES SCALE



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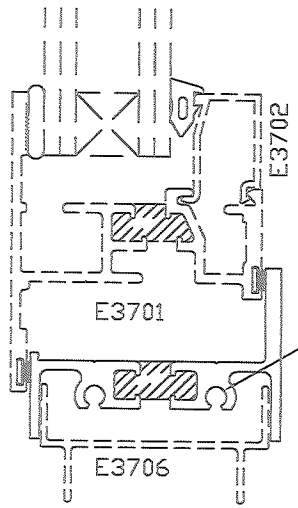

SIZED FOR #10-24
THREAD CUTTING
SCREW

ASSEMBLY

Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report# A4234.01

Date 10-14-10 Tech JB

AZOBRADE AND FULLY DEBRIDGE

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WALKER, MICHIGAN 49544

REV	DATE	DESCRIPTION	INTL
	08/25/00	RELEASED FOR TOOLING	CRH
	09/15/00	PART NUMBER WAS E9080003	CRH
	02/13/02	PART NUMBER WAS E9080A03	SRD
A	04/05/06	REVISED P&D CAVITY FOR AZOBRADE	JEN
	06/06/06	RELEASED FOR TOOLING	JEN

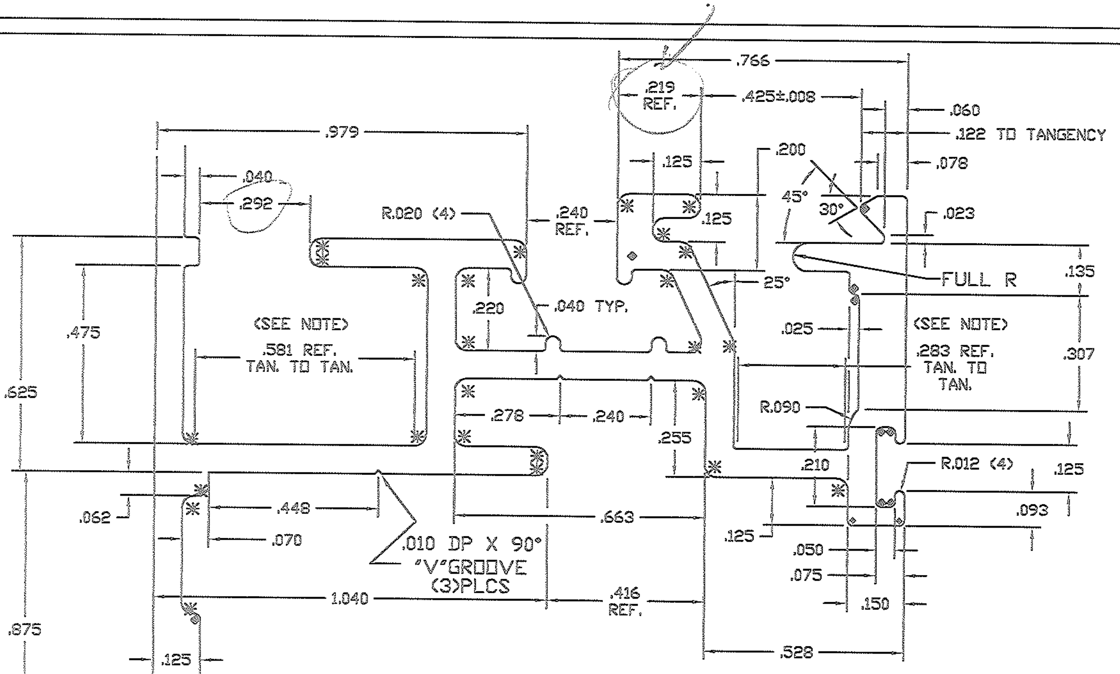
WALL THK	.075	SECTION CLASS	S	MAT'L	6063-T5	RATIO	111/1
PERIMETER OUT (TOTAL)	11.054			AREA	.504	WGT/FT	.592
FACTOR	20	CIRCLE SIZE	2.415			INFILL VOLUME	.1582

IXX	.672	SXX	.197	IMX	.228	CXX	.826
IYY	.284	SYY	.048	IYY	.041	CYY	.528

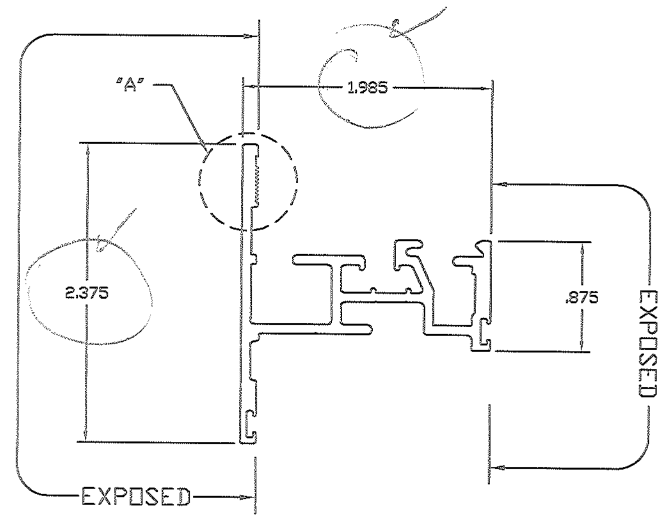
CONVENTIONAL VENT FRAME 1 3/8" X 2"
VENT WINDOW

DRAWN BY	CRH	DRWG DATE	08/23/00	APPV'D BY	DATE APPV'D
DWG SCALE	NOTED	PRODUCT CODE	120	E3700	REV A

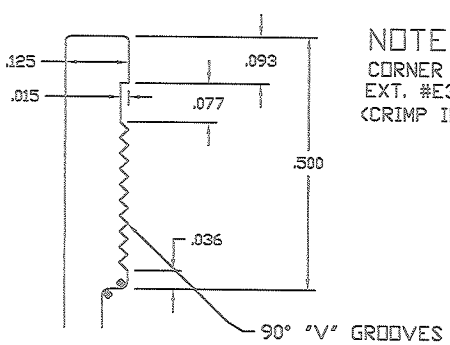
E3701



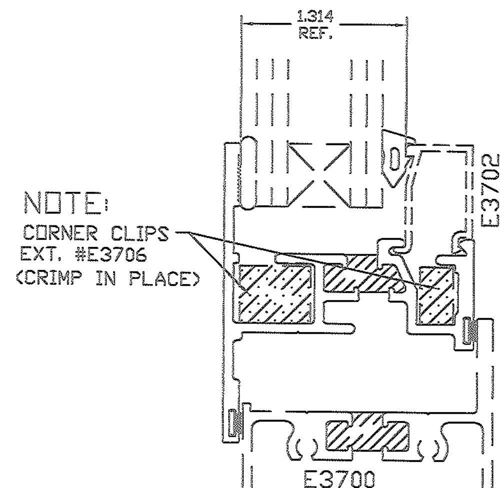
THREE TIMES SCALE



FULL SIZE



DETAIL "A"
FOUR TIMES SCALE



ASSEMBLY

Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report# A4234.01

Date 10-14-10 Tech JRB

MATES WITH E3700, E3702 AND E3706

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3056 WALKER RIDGE NW, SUITE G
WALKER, MICHIGAN 49544

REV	DATE	DESCRIPTION	INTL
	08/25/00	RELEASED FOR TOOLING	CRH
	09/15/00	PART NUMBER WAS E9080004	CRH
	02/13/02	PART NUMBER WAS E908A04	SRD

WALL THK. .075	SECTION CLASS S	MAT'L 6063-T5	RATIO 8.7:1
PERIMETER OUT (TOTAL) 15.987		AREA .639	WGT/FT .751
FACTOR 21	CIRCLE SIZE 2.737	INFILL VOLUME 1.680	

RXX .714	SXX .283	IXX .326	CXX 1.151
RYY .460	SYY .112	IYY .135	CYY 1.203

CONVENTIONAL VENT SASH 2 3/8" X 2"
VENT WINDOW

DRAWN BY CRH	DRWG DATE 08/17/00	APPV'D BY	DATE APPV'D
DWG SCALE NOTED	PRODUCT CODE 120	E3701	REV