

## TEST REPORT

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

REPORT NO.: 1931.01-106-11

RENDERED TO: GAMCO CORPORATION  
Flushing, New York

PRODUCT TYPE: Aluminum Outswing Awning Window

SERIES / MODEL: W250HC

Test	Summary of Results
Primary Product Designator	Class CW – PG30 1524 x 914 (60 x 36)-AP
Design Pressure	±1440 Pa (±30.08 psf)
Air Infiltration at 75 Pa (1.57 psf)	0.1 L/s/m <sup>2</sup> (0.02 cfm/ft <sup>2</sup> )
Air Exfiltration at 75 Pa (1.57 psf)	0.4 L/s/m <sup>2</sup> (0.08 cfm/ft <sup>2</sup> )
Water Penetration Resistance Test Pressure	580 Pa (12.12 psf)

**Test Completion Date:** 6/28/2019

Reference must be made to Report No. 1931.01-106-11, dated 8/23/2019 for complete test specimen description and detailed test results.

**CLIENT INFORMATION:** GAMCO CORPORATION  
131-10 Maple Ave.  
Flushing, New York 11355

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

**PROJECT SUMMARY:**

**PRODUCT TYPE:** Aluminum Outswing Awning Window

**SERIES/MODEL:** W250HC

**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 methods. A summary of the ratings achieved for the specimen tested are shown in the table below.

SPECIMEN	SPECIFICATION	PRODUCT RATING
1	101/I.S.2/A440-17	Class CW – PG30 1524 x 914 (60 x 36)-AP

**PROJECT DETAILS:**

**Test Dates:** 5/15/2019 – 6/28/2019

**Test Record Retention End Date:** 6/28/2023

**Test Location:** Molimo, LLC test facility in York, Pennsylvania.

**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. Test specimen drawings are located in Appendix C of this report.

**WITNESSES:**

The following representatives witnessed all or part of the testing.

<b>Name</b>	<b>Company</b>
Joe Allison	Molimo, LLC
Michael D. Stremmel, P.E.	Molimo, LLC
Joseph Enriquez	Molimo, LLC

**TEST METHOD:**

AAMA/WDMA/CSA 101/I.S.2/A440-11, *NAFS 2017 - North American Fenestration Standard/Specification for Windows, Doors, and Skylights*

**TEST SPECIMEN DESCRIPTION:****PRODUCT SIZES:**

Overall Size: 1524 mm x 914 mm (60" x 36")  
Overall Area: 1.39 m<sup>2</sup> (15.0 ft<sup>2</sup>)  
Sash Size: 1479.5 mm x 844.5 mm (58-1/4" x 33-1/4")

**FRAME CONSTRUCTION:**

Material: Poured and debridged, thermally improved, extruded aluminum  
Corner Details: Coped and butted, sealed with sealant and secured with four #8 x 2" pan head screws per corner

**VENT CONSTRUCTION:**

Material: Poured and debridged, thermally improved, extruded aluminum  
Corner Details: Miter-cut, sealed with sealant and secured with two internal aluminum corner keys with one lanced stake per member end

**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	1" IG
Glazing Construction (exterior to interior)	1/8" thick tempered glass 3/4" desiccant filled, aluminum box type spacer 1/8" thick tempered glass
Glazing Method	Set from the interior glazed against a bead of sealant and secured with aluminum snap-fit glazing beads with a gasket against the glass
Glazing Bite	1/2"
Daylight Opening Vent:	1346 mm x 711 mm (53 x 28")

**WEATHERSTRIPPING:**

Description	Quantity	Location
3/16" diameter foam-filled vinyl bulb	1 Row	Frame and vent perimeters

**DRAINAGE:**

Description	Quantity	Location
1-1/8" wide x 1/4" high weep slot	2	Sill face, 4" from each end

**HARDWARE:**

Description	Quantity	Location
Lever lock	2	Sill, 11" from each corner
Single Bar Support Hinge	2	One at each jamb, located at the top corners of each stile
Plastic snubber	1	Midspan of the top rail

**TEST SPECIMEN DESCRIPTION:** (Continued)

**INSTALLATION:** The specimen was installed into a Spruce-Pine-Fir wood buck. The rough opening allowed for a 1/2" shim space. The exterior perimeter of the specimen was sealed with sealant.

Location	Anchor Description	Anchor Spacing
Head and sill	#8 x 3" wood screw	5" from each end and spaced 16" on center, through the frame into the wood buck
Jambs	#8 x 3" wood screw	5" from each end and midspan, through the frame into the wood buck

**TEST RESULTS:** The temperature during testing was 21.7 °C (71 °F).

**OPERATING FORCE:** First Half (per ASTM E 2068)

Test	Results	Allowable
Initiate Motion	18 N (4 lbf)	70 N (15 lbf)
Maintain Motion (Opening)	18 N (4 lbf)	45 N (10 lbf)
Maintain Motion (Closing)	18 N (4 lbf)	45 N (10 lbf)
Locks / Latches	22 N (5 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:** First Half (per ASTM E 283)

Test	Results	Allowable
Infiltration @ 75 Pa (1.57 psf)	0.1 L/s/m <sup>2</sup> (0.02 cfm/ft <sup>2</sup> )	0.5 L/s/m <sup>2</sup> (0.10 cfm/ft <sup>2</sup> )
Exfiltration @ 75 Pa (1.57 psf)	0.4 L/s/m <sup>2</sup> (0.08 cfm/ft <sup>2</sup> )	0.5 L/s/m <sup>2</sup> (0.10 cfm/ft <sup>2</sup> )

*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.*

**TEST RESULTS:** (Continued)

**WATER PENETRATION TESTING:** (per ASTM E 547)

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

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

**UNIFORM LOAD TESTING:** (per ASTM E 330)

Design Pressure Test	Results	Allowable
Deflection measured between the lock points +1920 Pa (+40.10 psf) -1920 Pa (-40.10 psf)	≤0.2 mm (≤0.01") 0.2 mm (0.01")	5.0 mm (0.20") 5.0 mm (0.20")

Structural Test	Results	Allowable
Permanent Set measured between the lock points +2160 Pa (+45.11 psf) -2160 Pa (-45.11 psf)	0.5 mm (0.02 ") 1.0 mm (0.04")	1.7 mm (0.07") 1.7 mm (0.07")

*Note #4: All loads were held for 10 seconds.*

*Note #5: 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.*

**TEST RESULTS:** (Continued)**SECONDARY TESTING:**

Test	Results	Allowable
FORCED ENTRY RESISTANCE per ASTM F 588 Type: B – Grade: 10	Pass	No Entry
AWNING, HOPPER, PROJECTED HARDWARE LOAD TEST 140 N (30 lbf)	41.9 mm (1.65")	47.8 mm (1.88")

**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:

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Joseph W. Enriquez  
Project Manager

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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: Drawings (7)

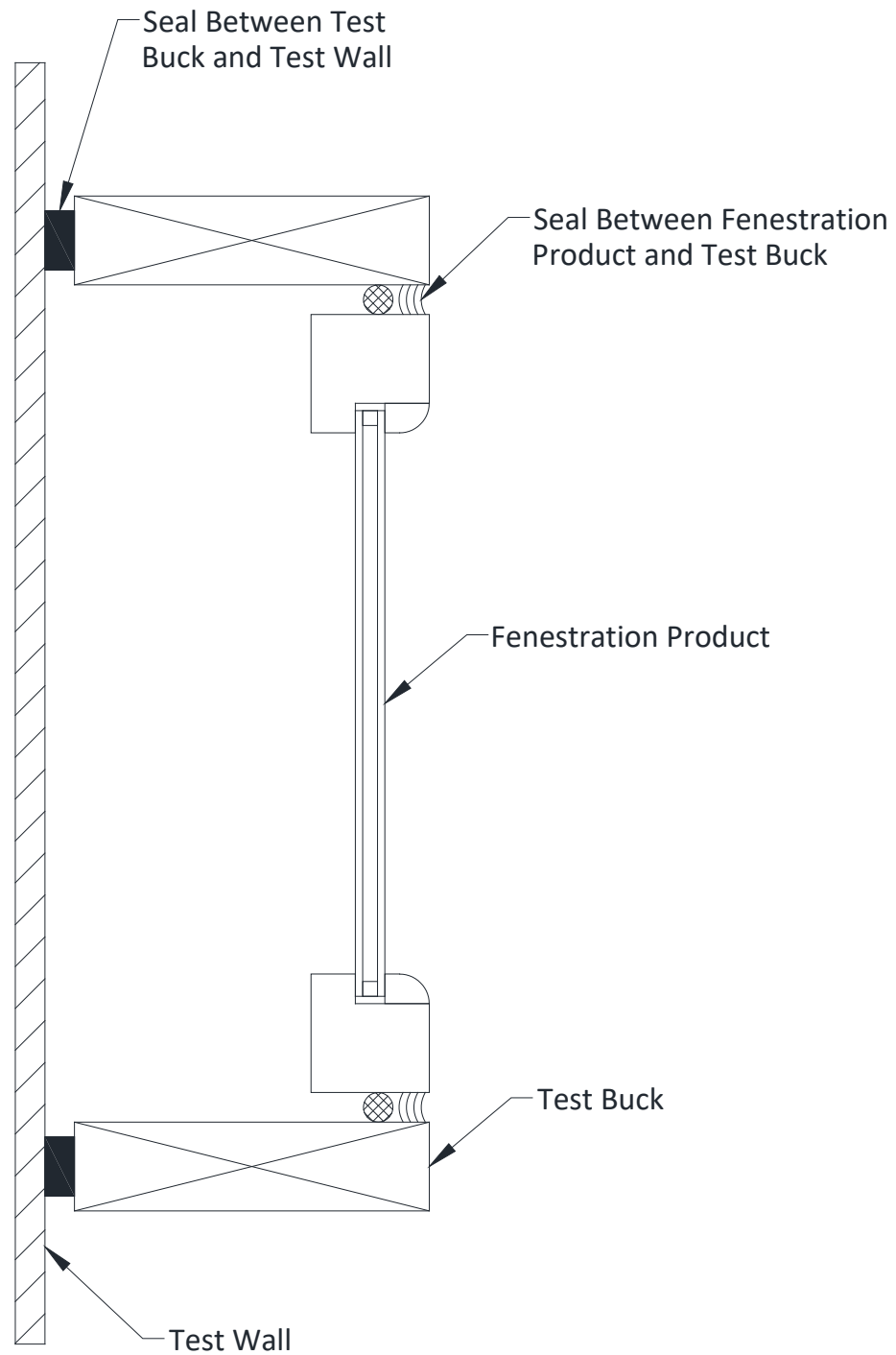
This report was produced from controlled document template MMO 00013, Rev 2, 8/28/2018.



**Appendix A****Alteration Addendum**

No alterations were performed.

**Appendix B**  
**Air Seal Location**



## **Appendix C**

### **Drawings**

BOM: W250HC-AWNING			
ITEM	DESCRIPTION	PART NO.	QTY.
1	250C/HC Window Head/Sill	H-16980	2
2	250HC Main Frame	H-2656	2
3	250HC Project-out	H-2660	4
4	250 Corner Key	S-13020	8
5	250 1" Glazing Bead	S-13014	4
6	Project-out cam handle w/ keeper. LH	WH2L41577	1
7	Project-out cam handle w/ keeper. RH	WH2L41578	1
8	HC 4 Bar Hinge, 3mm x 22mm W x 28" L	WH1H728N	2
9	Locking Block	WH7B2011	1
10	Setting Block	WH6N582	2
11	Butyl Tape for 1" I.G.	WH5G3654	4
12	Rubber Apply for 1" I.G.	WH6U3175	4
13	T-slot Bulb Seal Rubber	WH5T175B	8
14	Insulated Glass 1"	1/8" x 1/8"	-

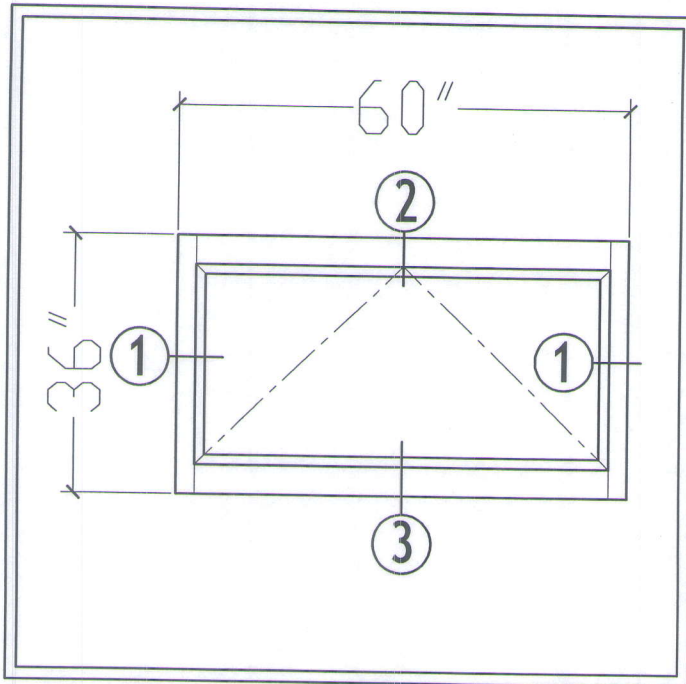


**Molimo**<sup>TM</sup>  
Architectural Product Testing

Report #: 1931.01-106-11

Date: 8/23/2019

By: M. Stremmel



## W250HC SERIES WINDOW PROJECT-OUT AWNING

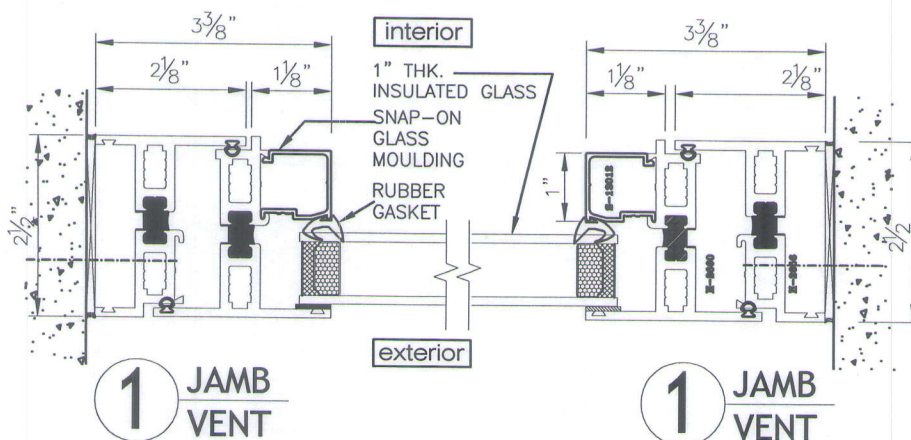
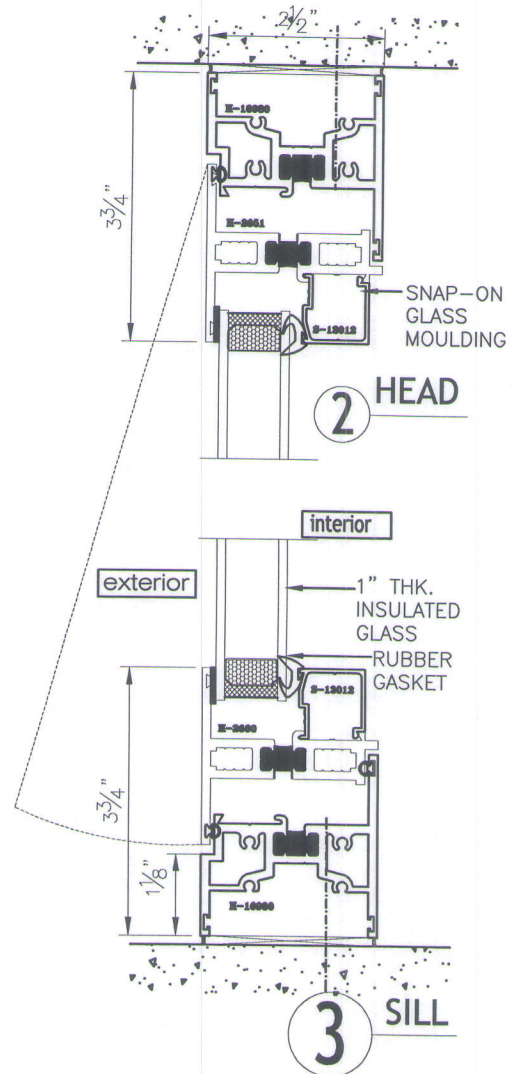


**Molimo**  
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SHEET #

2F

Drawn by: C. CHAN

Checked by:

Date: 6-2-16

Scale: 3/16"=1'-0"

Customer

Project: W250HC  
PROJECT-OUT WINDOW

### Revisions

No.	Date	Description
01	10-29-18	UPDATED DIMENSIONS



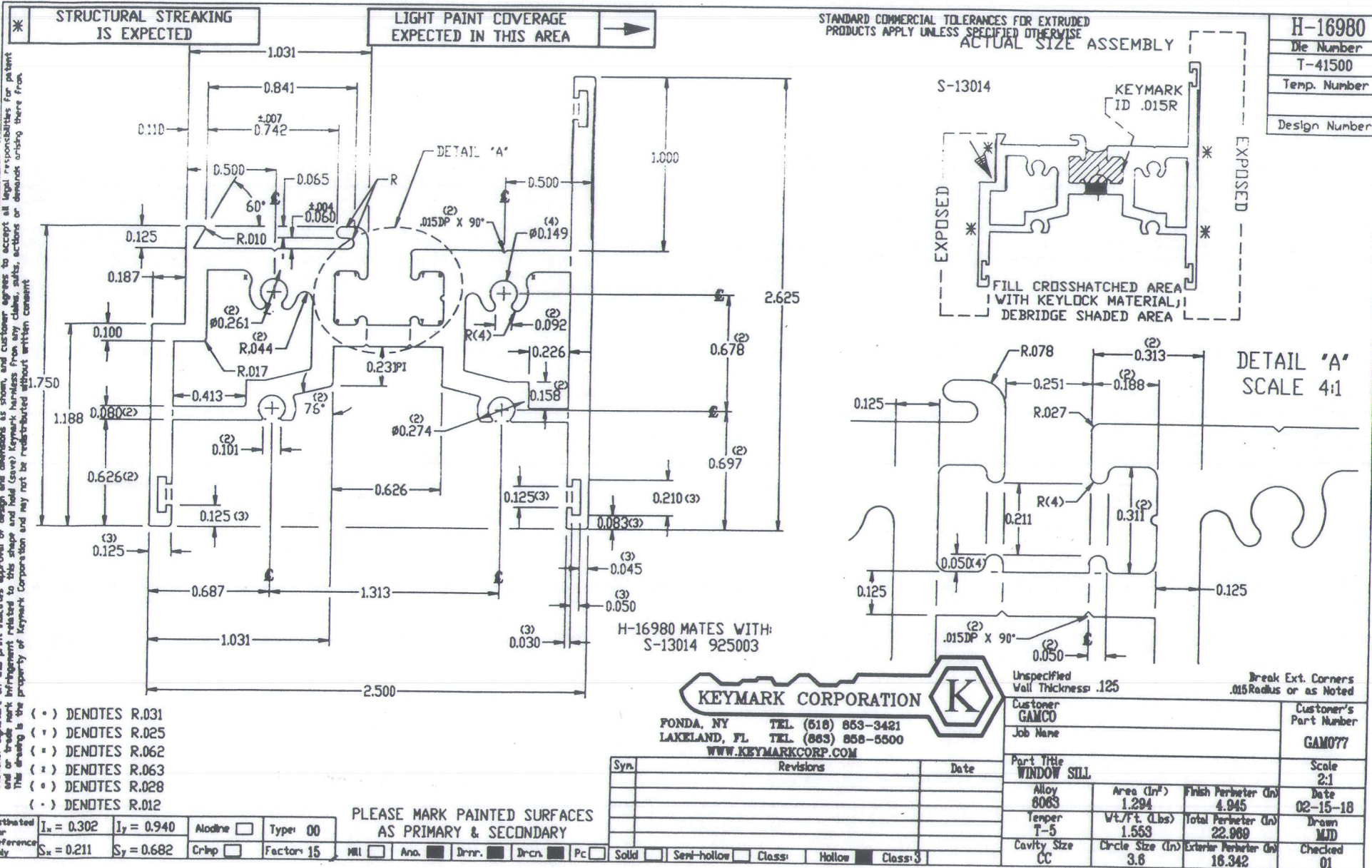
**GAMCO CORPORATION**

MANUFACTURERS OF FENESTRATION PRODUCTS

131-10 MAPLE AVE. FLUSHING, N.Y. 11355

TEL: (718) 359-8833 FAX: (718) 359-8661

info@gamcocorp.com www.gamcocorp.com



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Estimated  
For  
Reference  
Only

**STRUCTURAL STREAKING  
IS EXPECTED**

UNIFORM PAINT COVERAGE  
NOT EXPECTED IN THIS AREA



STANDARD COMMERCIAL TOLERANCES FOR EXTRUDED  
PRODUCTS APPLY UNLESS SPECIFIED OTHERWISE

H-02656

## Die Number

Temp. Number

Design Number

ACTUAL SIZE ASSEMBLY

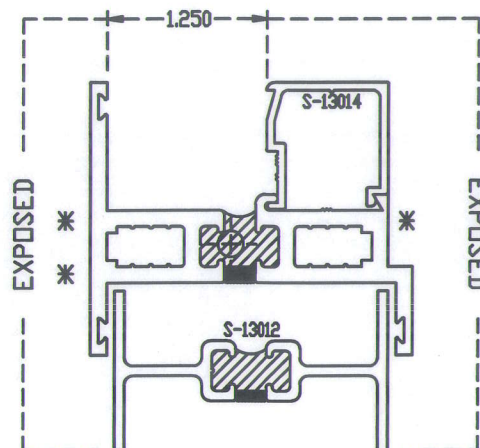
H-02656 MATES WITH:

S-13011 923001

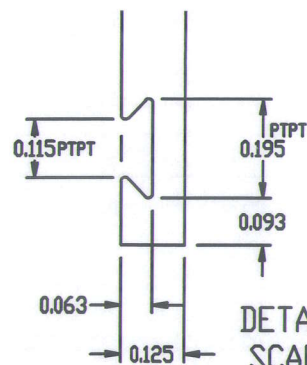
S-13012 923004

S-13014 923003

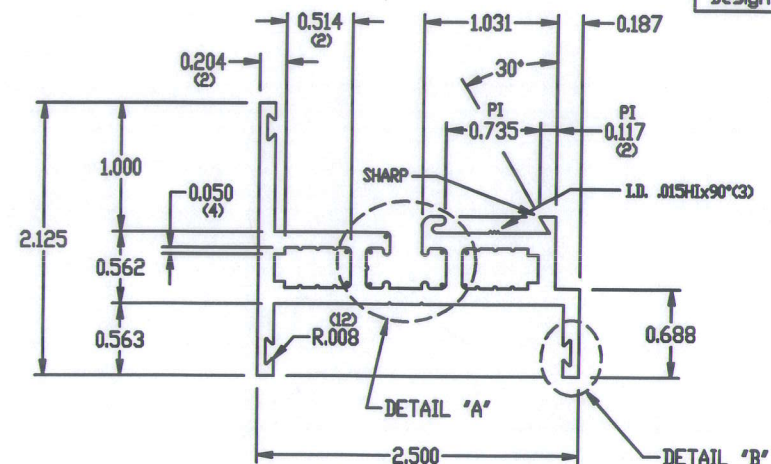
S-13023 923009



FILL CROSSHATCHED AREA  
WITH KEYLOCK MATERIAL,  
DEBRIDGE SHADED AREA



DETAIL "B"  
SCALE 4:1  
(TYP 3)



{ . } DENOTES R .031 ( 9 )



**Molimo™**  
Architectural Product Testing

Report #: 1931.01-106-11

Date: 8/23/2019

By: M. Stremmel

**KEYMARK CORPORATION**



**FONDA, NY TEL. (518) 853-3421**  
**LAKELAND, FL TEL. (863) 858-5500**  
**WWW.KEYMARKCORP.COM**

Syn.	Revisions				Date
6	PRINT REVISION				06-20-10
	MADE .115 AND .195 PT DIMENSIONS (AD)				06-20-10
	Solid	Seal-hollow	Class	Hollow	Class
					PP

Unspecified  
Wall Thickness: .125

Break Ext. Corners  
.015 Radius or as Noted

Customer  
**KEYMARK CORPORATION**

Customer's  
Part Number

Job Name  
930 PROJECTED WINDOW

830001


Part Title	Material	Quantity	Unit	Weight	Volume	Value	Notes
MAIN FRAME (MALE)							

**Scale**

Alloy 6063	Area (In <sup>2</sup> ) 1.020	Finish Perimeter (In) 3.937	Date 08-01-88
Temper T-5	Wt/Ft (Lbs) 1.224	Total Perimeter (In) 17.434	Drawn C.J.T.
Cavity Size CC	Circle Size (In) 3.3	Exterior Perimeter (In) 13.680	Checked S.J.S.

Estimated For Reference Only	$I_x = 0.148$	$I_y = 0.738$	Alodine <input type="checkbox"/>	Type: 00
	$S_x = 0.117$	$S_y = 0.522$	Crimp <input type="checkbox"/>	Factory: 14

MLL	<input type="checkbox"/>	Ang.	<input checked="" type="checkbox"/>	Drnr.	<input checked="" type="checkbox"/>	Drch.	<input checked="" type="checkbox"/>	Pc	<input type="checkbox"/>	Solid	<input type="checkbox"/>	Semi-hollow	<input type="checkbox"/>	Class	Hollow	<input checked="" type="checkbox"/>	Class	9	FP
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 **Molimo**<sup>TM</sup>  
Architectural Product Testing

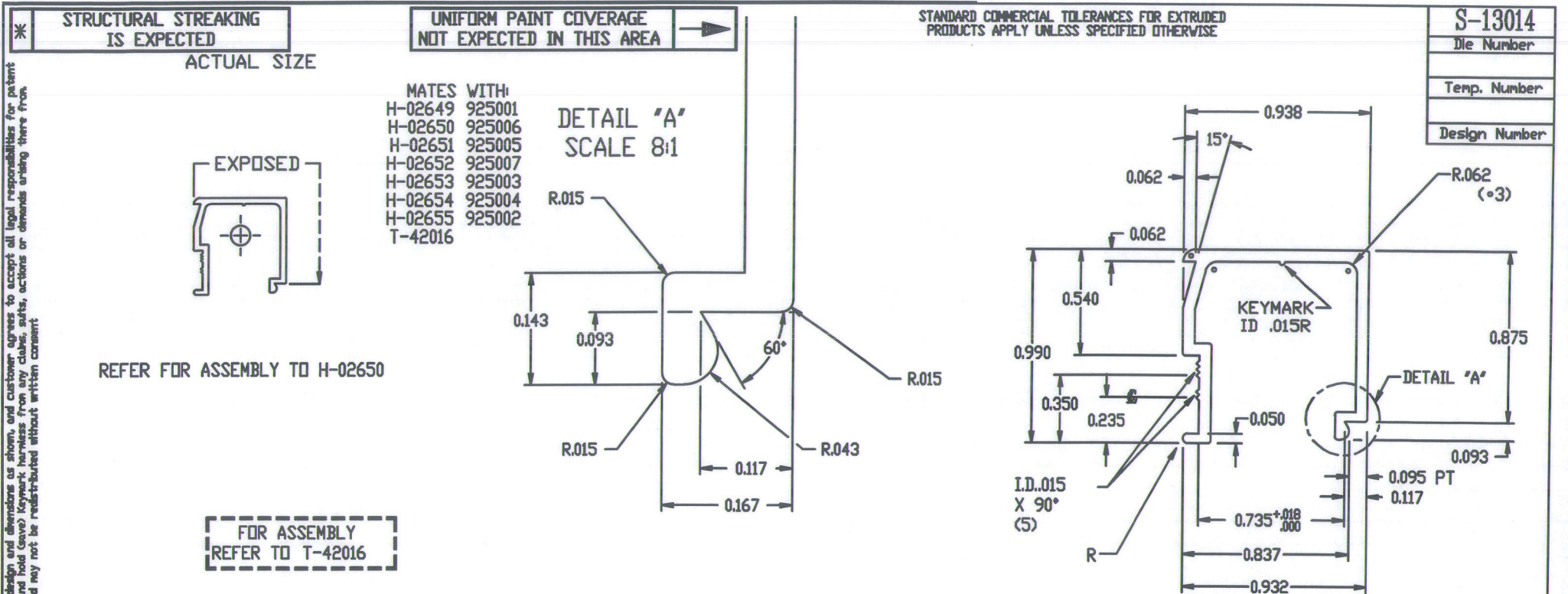
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LAKELAND, FL TEL (863) 858-5500  
WWW.KEYMARKCORP.COM

Syn.	Revisions	Date
A	.063 WAS .050	09-28-88

Unspecified Wall Thickness: .062			Break Ext. Corners .015 Radius or as Noted	
Customer KEYMARK CORPORATION			Customer's Part Number 925003	
Job Name 925/930 PROJECTED WINDOW			Scale 2:1	
Part Title GLAZING BEAD FOR 1" GLASS			Date 07-08-88	
Alloy 6063	Area (in²) 0.188	Finish Perimeter (in) 1.851	Drawn F.A.S.	
Temper T-5	Wt./Ft. (Lbs) 0.228	Total Perimeter (in) 6.179	Checked S.J.S. 05	
Cavity Size	Circle Size (in) 1.3	Exterior Perimeter (in) 6.179		

Estimated For Reference Only	I <sub>x</sub> = 0.020	I <sub>y</sub> = 0.026	Modline <input type="checkbox"/>	Type: 00
	S <sub>x</sub> = 0.033	S <sub>y</sub> = 0.055	Crimp <input type="checkbox"/>	Factor: 27


MIL ☐ Ano. ☒ Drnr. ☒ Drcn. ☒ Pc ☐ Solid ☒ Semi-hollow ☐ Class ☐ Hollow ☐ Class ☐

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\* STRUCTURAL STREAKING  
IS EXPECTED

STANDARD COMMERCIAL TOLERANCES FOR EXTRUDED  
PRODUCTS APPLY UNLESS SPECIFIED OTHERWISE

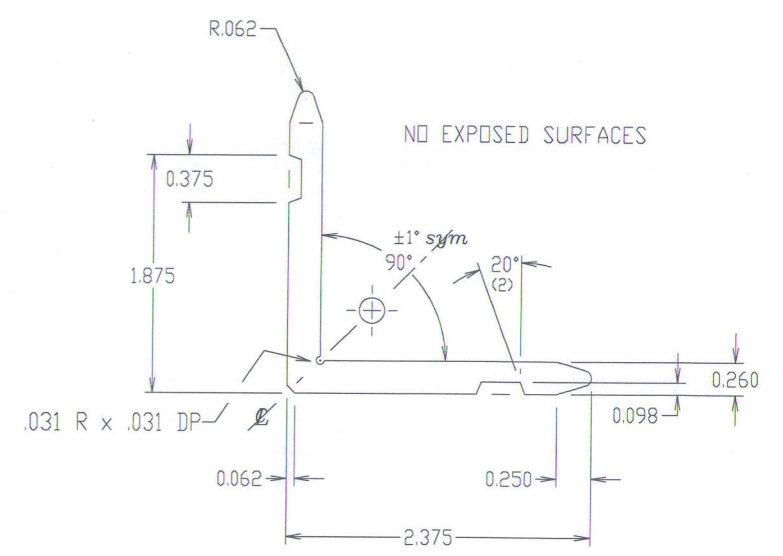
S-13020  
Die Number  
Temp. Number  
Design Number

**Molimo**  
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Date: 8/23/2019

By: M. Stremmel



KEYMARK CORPORATION  
FONDA, NEW YORK  
FAX ENG.(518)853-3435 SALES(518)853-3130  
TEL. (518) 853-3421 E-MAIL engny@keymarkcorp.com

Sym.	Revisions	Date

Unspecified Wall Thickness: .260		Break Ext. Corners .015 Radius or as Noted	
Customer KEYMARK CORPORATION		Customer's Part Number 925000	
Job Name 915/922/923/925/930 PROJECTED WINDOW		Scale 1:1	
Part Title CORNER KEY		Date 07-28-88	
Alloy 6105	Est. Area 1.052 In <sup>2</sup>	Finish Perimeter 0.000 In	Drawn F.A.S.
Temper T-5	Est. Wt./ft. 1.262 Lbs	Est. Perimeter 9.490 In	Checked S.J.S. 03
Cavity Size	Circle Size 3.2 In	Exterior Perimeter 9.490 In	

Estimated For Reference Only	I <sub>x</sub> = 0.505	I <sub>y</sub> = 0.505	Alodine <input type="checkbox"/>	Type: 00
	S <sub>x</sub> = 0.294	S <sub>y</sub> = 0.294	Crimp	Factor 8
Mill <input checked="" type="checkbox"/> Ano. <input type="checkbox"/> Drnr. <input type="checkbox"/> Drcn. <input type="checkbox"/> Pc <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Semi-hollow <input type="checkbox"/> Class <input type="checkbox"/> Hollow <input type="checkbox"/> Class <input type="checkbox"/>				