

TEST REPORT

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

REPORT No.: 1931.05-106-11

RENDERED TO: GAMCO CORPORATION
Flushing, New York

PRODUCT TYPE: Aluminum Fixed Window

SERIES / MODEL: W250HC

Test	Summary of Results
Primary Product Designator	Class AW – PG40 1524 x 2515 (60 x 99)-FW
Design Pressure	±1920 Pa (±40.10 psf)
Air Infiltration at 300 Pa (6.24 psf)	≤0.2 L/s/m ² (≤0.01 cfm/ft ²)
Air Exfiltration at 75 Pa (1.57 psf)	≤0.2 L/s/m ² (≤0.01 cfm/ft ²)
Water Penetration Resistance Test Pressure	580 Pa (12.12 psf)

Test Completion Date: 5/17/2019

Reference must be made to Report No. 1931.05-106-11, 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 Fixed 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 AW – PG40 1524 x 2515 (60 x 99)-FW

PROJECT DETAILS:

Test Dates: 5/14/2019 – 5/17/2019

Test Record Retention End Date: 5/17/2023

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.

Name	Company
Joe Allison	Molimo, LLC
Michael D. Stremmel, P.E.	Molimo, LLC
Joseph Enriquez	Molimo, LLC

TEST METHODS:

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

AAMA 910-10, *Voluntary "Life Cycle" Specifications and Test Methods for AW Class Architectural Windows and Doors*

TEST SPECIMEN DESCRIPTION:**PRODUCT SIZES:**

Overall Size: 1524 mm x 2515 mm (60" x 99")

Overall Area: 3.83 m² (41.25 ft²)

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

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)	1/4" thick tempered glass 1/2" desiccant filled, aluminum box type spacer 1/4" 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:	1409.7 mm x 2368.5 mm (55-1/2" x 93-1/4")

DRAINAGE: No drainage was utilized.

HARDWARE: No hardware was utilized.

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	3" wide by 4" long aluminum "Z" shaped clip, secured to the wood buck with one #8 x 1-1/2" screw, and secured to the window frame with two #10 x 5/8" pan head screws	10" from each end and spaced approximately 13" on center (4 per head/sill)
Jambs		13" from each end and spaced approximately 14" on center (6 per jamb)

TEST RESULTS: The temperature during testing was 17.2 °C (63 °F).

AIR LEAKAGE TESTING: First Half (per ASTM E 283)

Test	Results	Allowable
Infiltration @ 300 Pa (6.24 psf)	$\leq 0.2 \text{ L/s/m}^2$ ($\leq 0.01 \text{ cfm/ft}^2$)	0.5 L/s/m^2 (0.10 cfm/ft^2)
Exfiltration @ 75 Pa (1.57 psf)	$\leq 0.2 \text{ L/s/m}^2$ ($\leq 0.01 \text{ cfm/ft}^2$)	0.5 L/s/m^2 (0.10 cfm/ft^2)

Note #1: 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: First Half (per ASTM E 331 and ASTM E 547)

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

Note #2: Water Penetration testing was performed without an insect screen.

THERMAL CYCLING: (per AAMA 501.5)

Note #3: Per AAMA 910-10 family grouping rules, reference must be made to Molimo Report No. 1931.04-106-11 for thermal cycling test results.

UNIFORM LOAD TESTING: (per ASTM E 330)

Design Pressure Test	Results	Allowable
Deflection measured between anchors at jamb		
+1920 Pa (+40.10 psf)	0.02 mm (0.001")	2.0 mm (0.08")
-1920 Pa (-40.10 psf)	0.07 mm (0.003")	2.0 mm (0.08")

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.

AIR LEAKAGE TESTING: Second Half (per ASTM E 283)

Test	Results	Allowable
Infiltration @ 300 Pa (6.24 psf)	$\leq 0.2 \text{ L/s/m}^2$ ($\leq 0.01 \text{ cfm/ft}^2$)	0.5 L/s/m^2 (0.10 cfm/ft^2)
Exfiltration @ 75 Pa (1.57 psf)	$\leq 0.2 \text{ L/s/m}^2$ ($\leq 0.01 \text{ cfm/ft}^2$)	0.5 L/s/m^2 (0.10 cfm/ft^2)

TEST RESULTS: (Continued)

Note #6: 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: Second Half (per ASTM E 331 and ASTM E 547)

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

Note #7: Water Penetration testing was performed without an insect screen.

UNIFORM LOAD TESTING: (per ASTM E 330)

Structural Test	Results	Allowable
Permanent Set measured at the lock stile +2880 Pa (+60.10 psf) -2880 Pa (-60.10 psf)	0.25 mm (0.01") 0.25 mm (0.01")	0.73 mm (0.029") 0.73 mm (0.029")

Note #8: All loads were held for 10 seconds.

Note #9: 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: D – Grade: 10	Pass	No Entry

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:

Joseph W. Enriquez
Project Manager

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 (5)

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

Appendix A

Alteration Addendum

Alteration #1

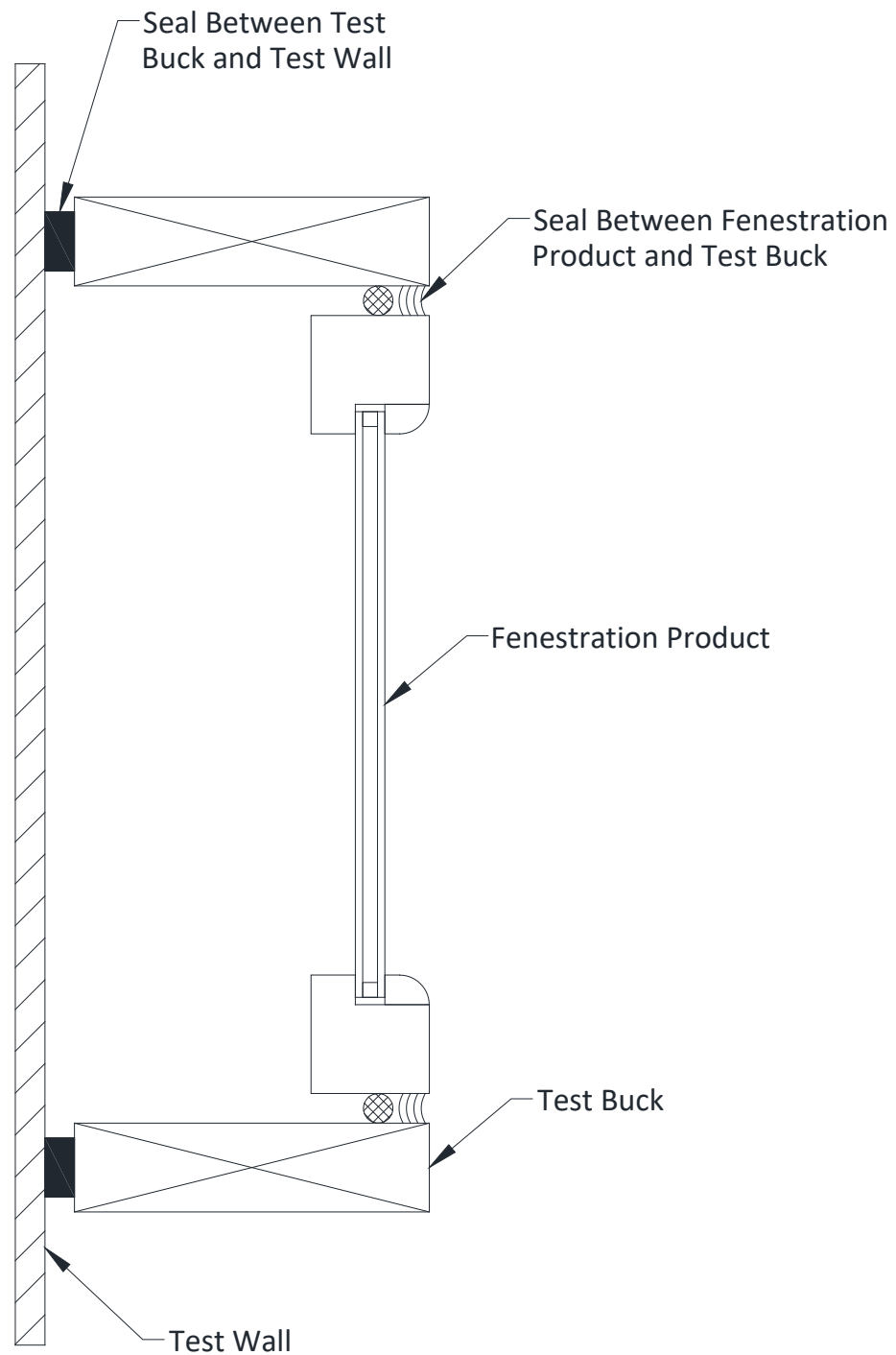
Date: 5/17/2019

Reason: Failed initial Water Penetration testing at 12.12 psf (580 Pa)

Remedial Work: Sealed the exterior weep holes and continued the testing with no weep holes. Air infiltration and exfiltration testing was repeated to obtain new results with weep holes isolated.

Appendix B

Air Seal Location



Appendix C

Drawings

BOM: W250HC-FIXED			
ITEM	DESCRIPTION	PART NO.	QTY.
1	250C/HC Window Head/Sill	H-16980	2
2	250HC Main Frame	H-2656	2
3	250 1" Glazing Bead	S-13014	4
4	Setting Block	WH6N582	2
5	Butyl Tape for 1" I.G.	WH5G3654	4
6	Rubber Apply for 1" I.G.	WH6U3175	4
7	Insulated Glass 1"	1/8" x 1/8"	-

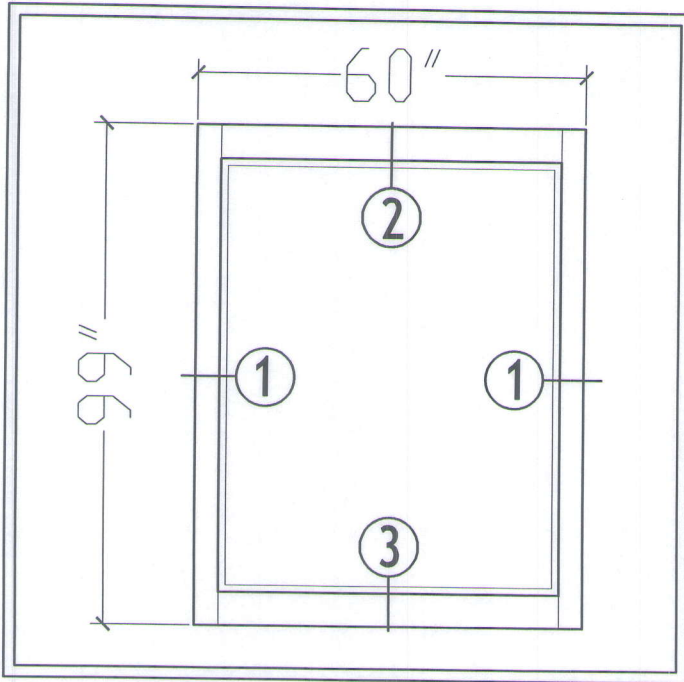


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Date: 8/23/2019

By: M. Stremmel



W250HC SERIES WINDOW FIXED LITE

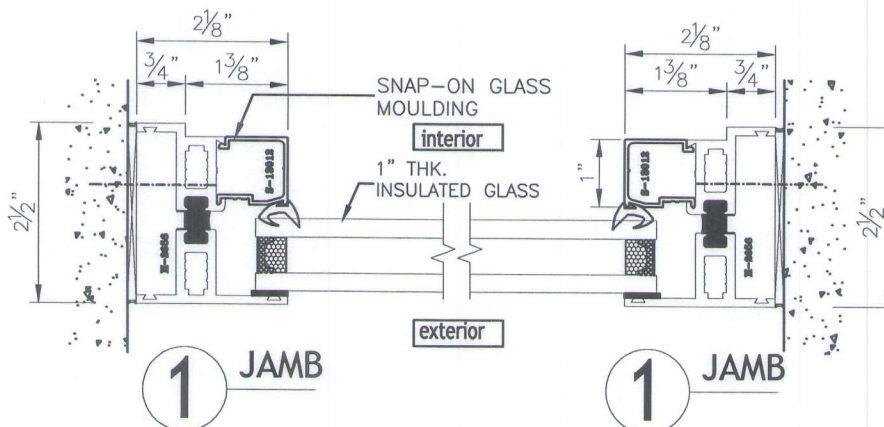
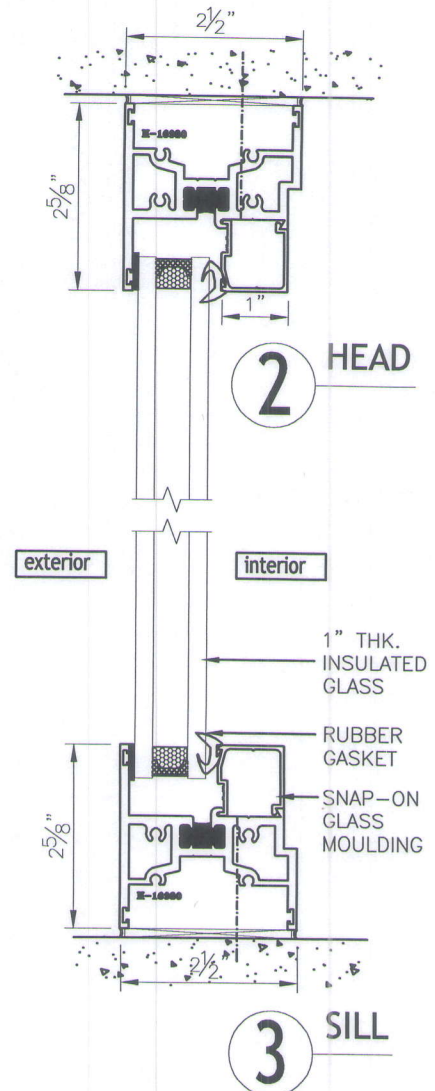


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By: M. Stremmel



SHEET #

2E

Drawn by: C. CHAN

Checked by:

Date: 6-2-16

Scale: 3/1'-0"

Customer

Project: W250HC
FIXED WINDOW

Revisions

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



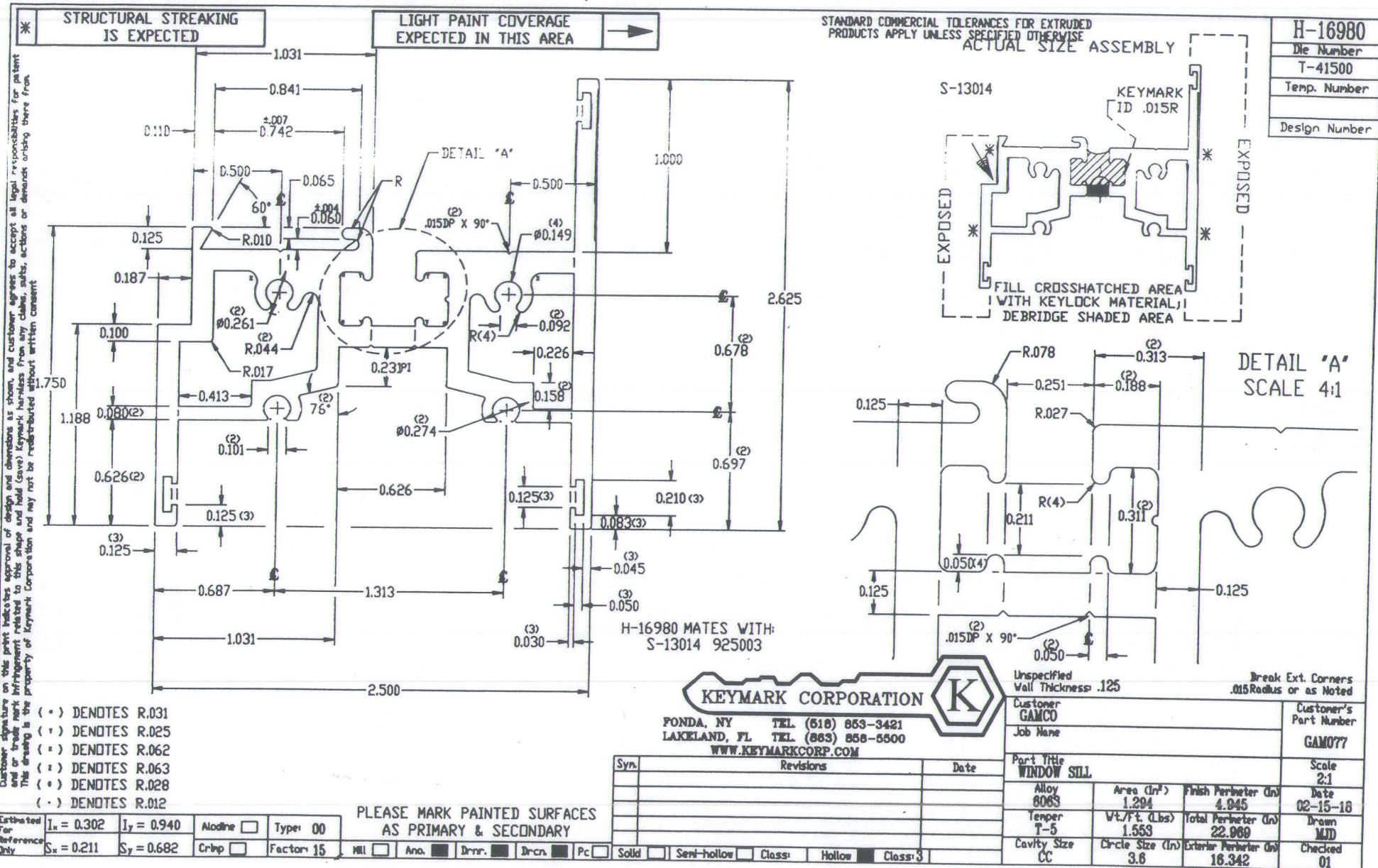
GAMCO CORPORATION

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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Customer signature on this print indicates approval of design and dimensions as shown, and customer agrees to accept all legal responsibilities for patent and or trade mark infringement related to this shape and hold (save) Keymark handles from any claims, suits, actions or demands arising there from. This drawing is the property of Keymark Corporation and may not be redistributed without written consent.

STRUCTURAL STREAKING
IS EXPECTED

UNIFORM PAINT COVERAGE
NOT EXPECTED IN THIS AREA

STANDARD COMMERCIAL TOLERANCES FOR EXTRUDED
PRODUCTS APPLY UNLESS SPECIFIED OTHERWISE

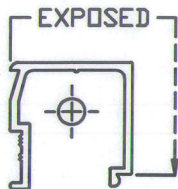
S-13014

Die Number

Temp. Number

Design Number

ACTUAL SIZE

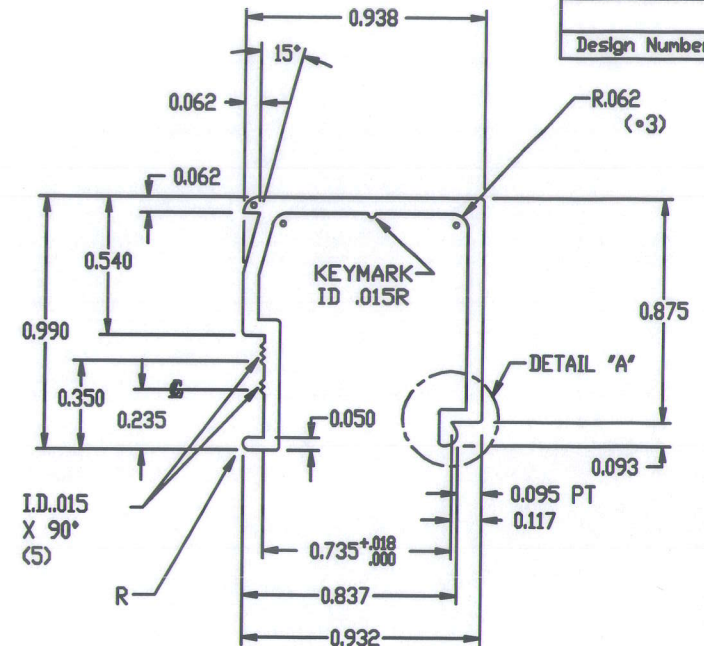
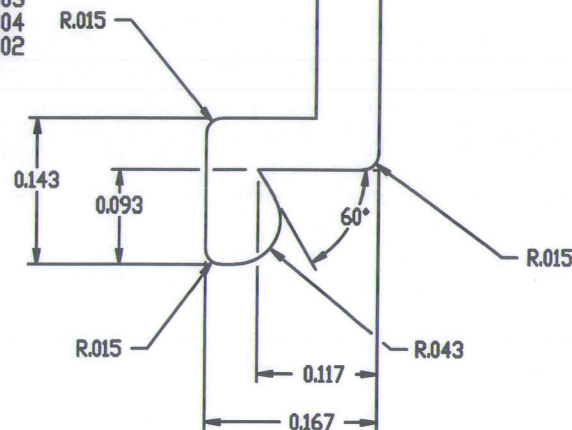


REFER FOR ASSEMBLY TO H-02650

FOR ASSEMBLY
REFER TO T-42016

MATES WITH:
H-02649 925001
H-02650 925006
H-02651 925005
H-02652 925007
H-02653 925003
H-02654 925004
H-02655 925002
T-42016

DETAIL 'A'
SCALE 8:1



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KEYMARK CORPORATION

FONDA, NY TEL (618) 863-3421
LAKELAND, FL TEL (863) 868-5500
WWW.KEYMARKCORP.COM

Syn.	Revisions	Date
A	.083 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			
Part Title GLAZING BEAD FOR 1" GLASS			Scale 2:1
Alloy 6063	Area (in ²) 0.188	Finish Perimeter (in) 1.851	Date 07-08-88
Temper T-5	Wt./Ft. (Lbs) 0.228	Total Perimeter (in) 6.179	Drawn F.A.S.
Cavity Size	Circle Size (in) 1.3	Exterior Perimeter (in) 6.179	Checked S.J.S. 05

Estimated For Reference Only	I _x = 0.020 S _x = 0.033	I _y = 0.026 S _y = 0.055	Modline <input type="checkbox"/> Type: 00	Factor: 27
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Mill ☐ Ano. ☐ Drnr. ☐ Drcn. ☐ Pc ☐ Solid ☐ Semi-hollow ☐ Class ☐ Hollow ☐ Class ☐