

TEST REPORT

AAMA/WDMA/CSA 101/I.S.2/A440-11

REPORT No.: 1391.03-106-11

RENDERED TO: GAMCO CORPORATION
Flushing, New York

PRODUCT TYPE: Aluminum Awning Window

SERIES / MODEL: W250C

Test	Summary of Results
Primary Product Designator	Class CW – PG30 1219 x 813 (48 x 32)-AP
Design Pressure	±1440 Pa (±3008 psf)
Air Infiltration	<0.1 L/s/m ² (<0.01 cfm/ft ²)
Water Penetration Resistance Test Pressure	220 Pa (4.60 psf)

Test Completion Date: 11/20/2017

Reference must be made to Report No. 1391.03-106-11, dated 1/8/2018 for complete test specimen description and detailed test results.

CLIENT INFORMATION: GAMCO CORPORATION
131-10 Maple Avenue
Flushing, New York 11355

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

PROJECT SUMMARY:

PRODUCT TYPE: Aluminum Awning Window

SERIES/MODEL: W250C

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 rating achieved for the specimen tested are shown in the table below.

SPECIMEN	SPECIFICATION	PRODUCT RATING
1	101/I.S.2/A440-11	Class CW – PG30 1219 x 813 (48 x 32)-AP

PROJECT DETAILS:

Test Dates: 11/20/2017 – 11/21/2017

Test Record Retention End Date: 11/21/2021

Test Location: Crystal Window and Door Systems, Ltd. test facility in Flushing, New York. In accordance with AAMA 205.01, calibration of manufacturers' test equipment is documented under Report No. 1391.01-106-11.

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 D of this report.

WITNESSES:

The following representatives witnessed all or part of the testing.

Name	Company
Qi Zhang	Gamco Corporation
Charles Ng	Crystal Window & Doors
Matt Hollinger	Molimo, LLC

TEST METHOD:

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

TEST SPECIMEN DESCRIPTION:**PRODUCT SIZES:**

Test Specimen #1:

Overall Size: 1219 mm x 813 mm (48" x 32")
Overall Area: 0.99 m² (10.67 ft²)
Vent Size: 1175 mm x 768 mm (46-1/4" x 30-1/4")

FRAME CONSTRUCTION:

Material: Thermally improved, poured and debridged, extruded aluminum
Corner Details: Miter-cut, sealed with sealant and secured with two interior aluminum corner keys with one lanced stake per key per member end

VENT CONSTRUCTION:

Material: Thermally improved, poured and debridged, extruded aluminum
Corner Details: Miter-cut, sealed with sealant and secured with two interior aluminum corner keys with one lanced stake per key 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.*

Glass Type: 1" IG

Glazing Construction: (exterior to interior)

1/8" thick annealed glass

3/4" spacer

1/8" thick annealed glass

Glazing Method: Set from the interior against a glazing compound and secured with snap-in aluminum glazing beads with a gasket against the glass.

Glazing Bite: 1/2"

Daylight Opening:

Exterior Sash: 1041 mm x 654 mm (41" x 25-3/4")

WEATHERSTRIPPING:

Description	Quantity	Location
0.230" diameter hollow bulb seal	1 Row	Head, sill and jams
0.250" diameter foam-filled hollow bulb seal	1 Row	Vent stiles and rails

DRAINAGE:

Description	Quantity	Location
7/8" wide by 1/8" high weepnotch	2	Sill, 4-1/2" from each corner

HARDWARE:

Description	Quantity	Location
1/4-turn metal locks	2	Vent bottom rail, 11-1/2" from each end
Plastic snubber set	1	Midspan of vent top rail
4-bar metal hinges	2	Top of each jamb/vent stile

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, sill, and jambs	#8 x 2-1/2" pan head screws	5" from corners and spaced 14" on center, through the frame into the wood buck

TEST RESULTS: The temperature during testing was 9.94 °C (49.9 °F).

OPERATING FORCE: (per ASTM E 2068)

Test	Results	Allowable
Initiate Motion	9 N (2.1 lbf)	Report Only
Maintain Motion (Opening)	9 N (2 lbf)	135 N (30 lbf)
Maintain Motion (Closing)	22 N (5 lbf)	135 N (30 lbf)
Locks / Latches	33 N (7.4 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: (per ASTM E 283)

Test	Results	Allowable
Infiltration @ 75 Pa (1.57 psf)	<0.1 L/s/m ² (<0.01 cfm/ft ²)	1.5 L/s/m ² (0.30 cfm/ft ²)

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.

WATER PENETRATION TESTING: (per ASTM E 547)

Test	Results	Allowable
220 Pa (4.60 psf)	Pass	No Leakage

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

TEST RESULTS: (Continued)

UNIFORM LOAD TESTING: (per ASTM E 330)

Design Pressure Test	Results	Allowable
Deflection measured at the vent bottom rail between locks +1440 Pa (+30.08 psf) -1440 Pa (-30.08 psf)	<0.3 mm (<0.01") <0.3 mm (<0.01")	3.6 mm (0.14") 3.6 mm (0.14")

Structural Test	Results	Allowable
Permanent Set measured at the vent bottom rail between locks +2160 Pa (+45.11 psf) -2160 Pa (-45.11 psf)	<0.3 mm (<0.01") <0.3 mm (<0.01")	1.8 mm (0.07") 1.8 mm (0.07")

Note 4: The deflections reported are not limited by AAMA/WDMA/CSA 101/I.S.2/A440 for this product designation and is recorded for information purposes only.

Note 5: All loads were held for 10 seconds.

Note 6: Tape and film were not used to seal against air leakage.

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)	19.1 mm (0.75")	34.5 mm (1.36")

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:



Matthew Hollinger
Senior Technician



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: Photograph (1)
- Appendix-D: Drawings (5)

Appendix A

Alteration Addendum

No alterations were performed.

Air Seal Location



Appendix C

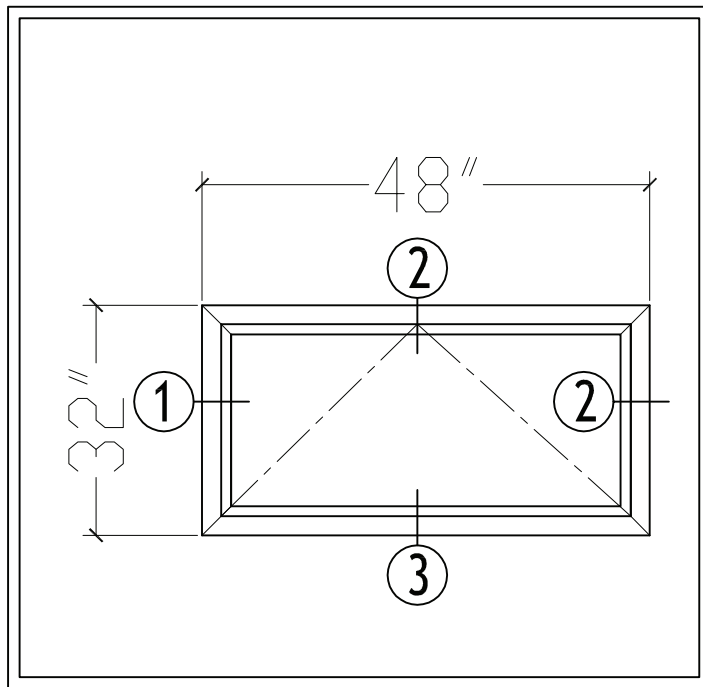
Photograph




Photo 1
Series W250C Awning Window

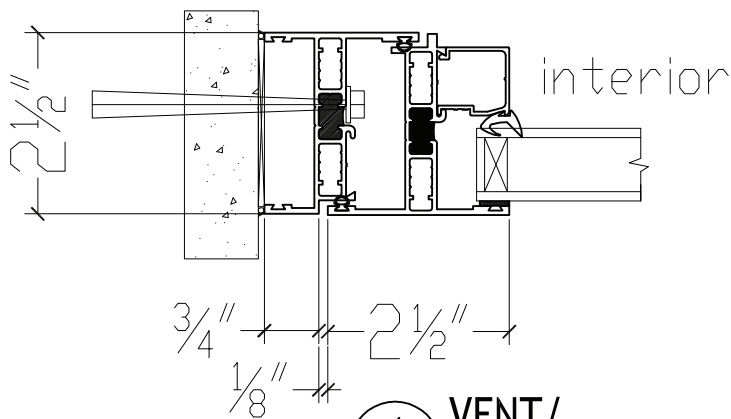
Appendix D

Drawings

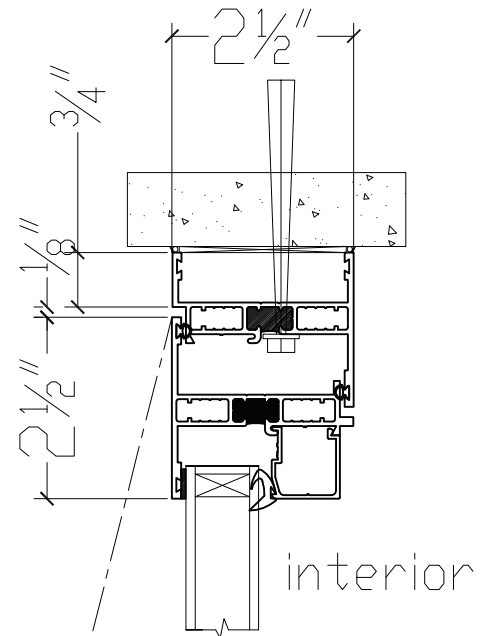


W250C PROJECT-OUT AWNING

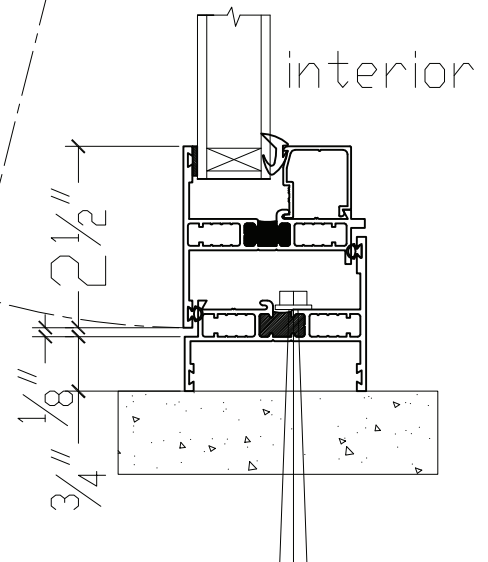
	Molimo™ Architectural Product Testing
Report #:	1391.03-106-11
Date:	1/8/2018
By:	M. Stremmel




1 VENT/
JAMB



2 VENT/
HEAD



3 VENT/
SILL

SHEET # 1 F	Drawn by: C. CHAN	Customer Project : W250C PROJECT-OUT WINDOW	Revisions				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
	Checked by:		No.	Date	Description		
	Date: 4-7-16		01	5-20-16	UPDATED DIMENSIONS		
	Scale: 3/4"=1'-0"						

H-02649

Die Number
Temp. Number
Design Number

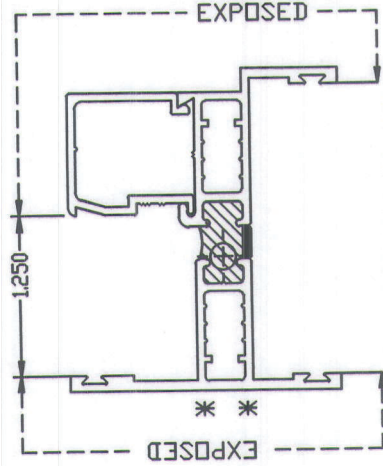
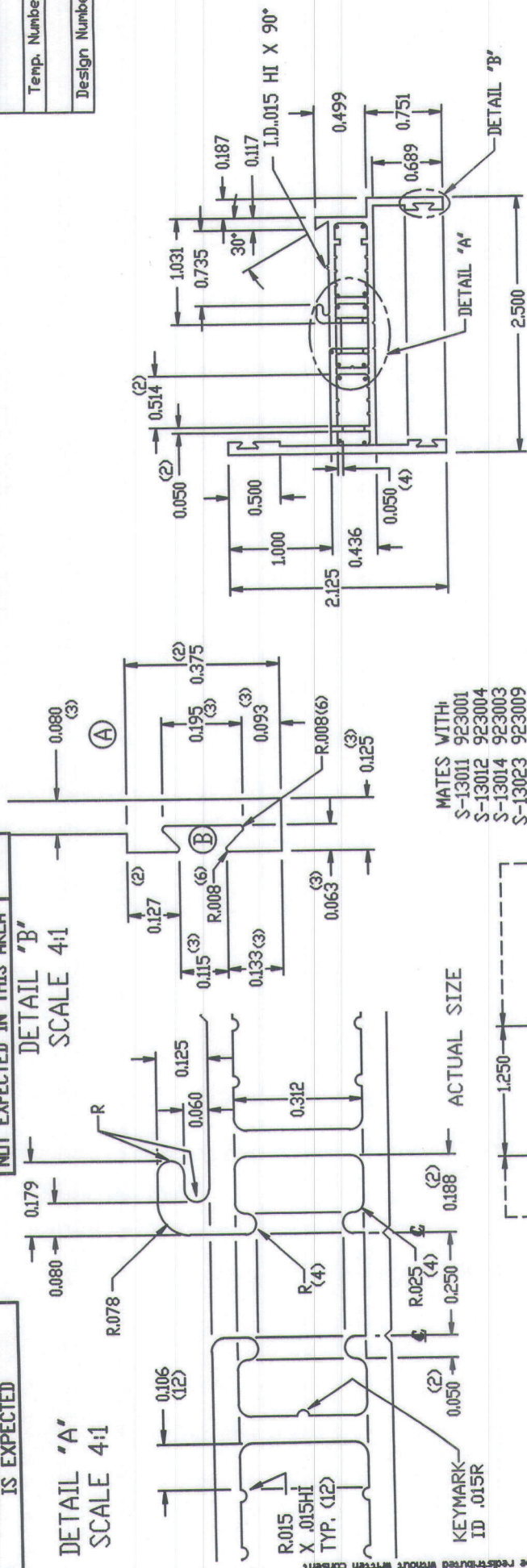
STANDARD COMMERCIAL TOLERANCES FOR EXTRUDED PRODUCTS APPLY UNLESS SPECIFIED OTHERWISE

UNIFORM PAINT COVERAGE NOT EXPECTED IN THIS AREA

STRUCTURAL STREAKING IS EXPECTED

DETAIL "B" SCALE 4:1

DETAIL "A" SCALE 4:1



Molimo
Architectural Product Testing

Report #: 1391.03-106-11
Date: 1/8/2018
By: M. Stremmel

KEYMARK CORPORATION
FONDA, NY TEL. (518) 869-3421
LAKELAND, FL TEL. (863) 868-5500
WWW.KEYMARKCORP.COM

Unspecified Wall Thickness: .062	Break Ext. Corners .015 Radius or as Noted
Customer: KEYMARK CORPORATION	Customer's Part Number: 925001
Job Name: 925 PROJECTED WINDOW	Scale: 1:1
Part Name: MAIN FRAME - MALE	Date: 07-28-88
Alloy: 6063	Finish Perimeter (in): 3.937
Temp: T-5	Area (in ²): 0.695
Cavity Size: CC	Wt./Ft. (Lbs): 18.632
	Perimeter (in): 14.043
	Circle Size (in): 3.2
	Checked: S.J.S.

FOR ASSEMBLY REFER TO H-02650

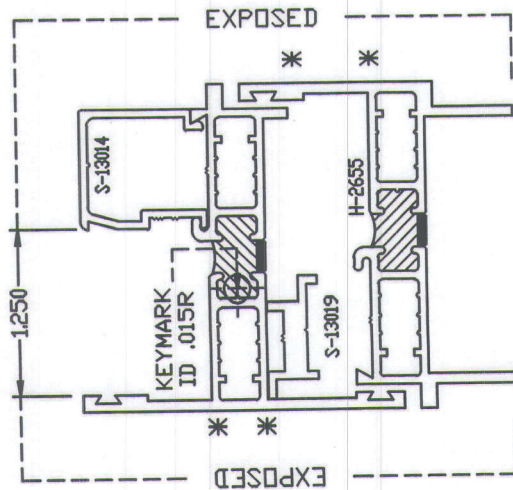
Syn	Revisions	Date
6	PRINT REVISION	11-07-16
5	PRINT REVISION	01-24-88
4	PRINT REVISION	10-13-88
3	PRINT REVISION	11-07-16

Estimated For Reference	I _x = 0.119	I _y = 0.518	Typen 00
	S _x = 0.098	S _y = 0.357	Factor 24

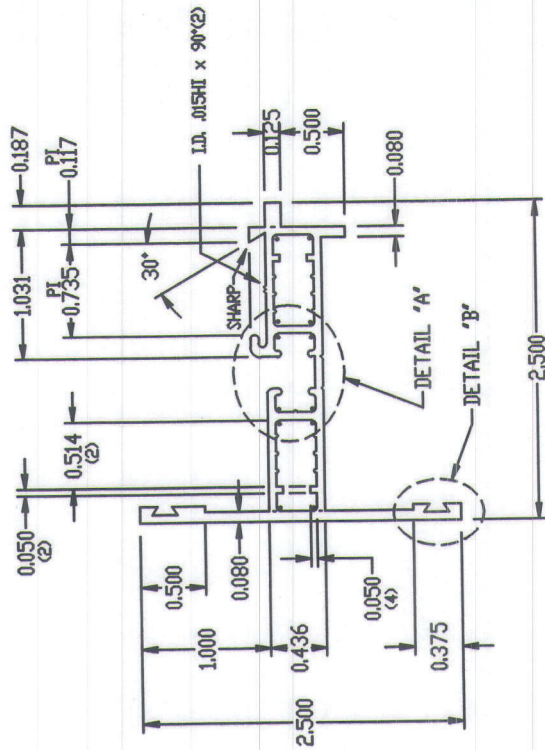
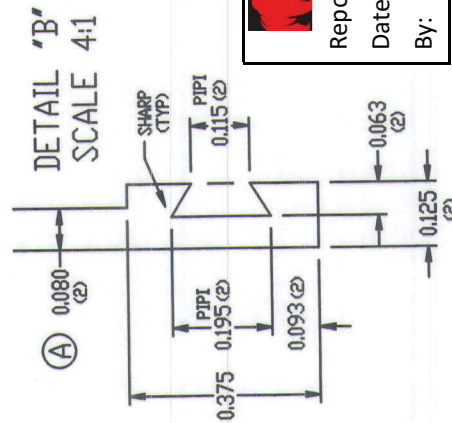
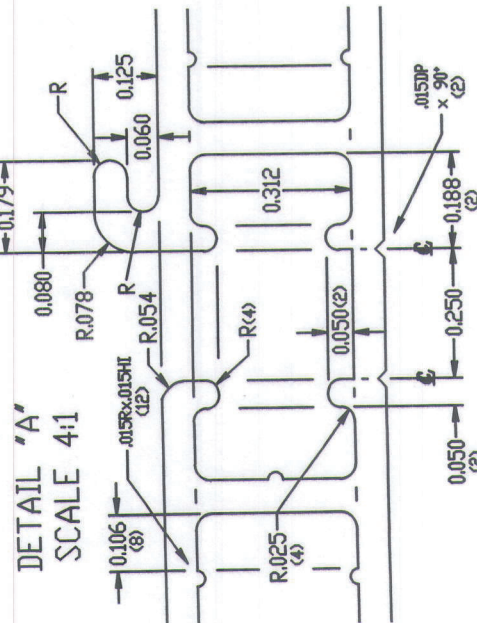
**UNIFORM PAINT COVERAGE
NOT EXPECTED IN THIS AREA**

H-02651 MATES WITH:
S-13011 923001
S-13014 923003

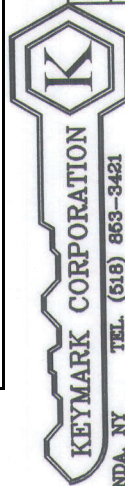
FILL CROSSHATCHED AREA
WITH KEYLOCK MATERIAL;
DEBRIDGE SHADED AREA



ACTUAL SIZE ASSEMBLY



Report #: 1391.03-106-11
Date: 1/8/2018
By: M. Stremmel



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

Revisions

Syr#	Revisions	Date
5	PRINT REVISION	01-06-05
A	.080 WAS .082	10-23-88
Solid	Seal Hollow	Class 3
	Hollow	RP

Unspecified	Wall Thickness	.062
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Customer
KEYMARK CORPORATION

Job Name
026 PROTECTED WINDOW

Part Title
VENT SASH PROJECT OUT

Alloy 6063	Area (in ²) 0.629
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Temper	Vt./Ft. (Lbs)
T-5	0.755

Cavity size CC	Circle size 3.1
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STANDARD COMMERCIAL TOLERANCES FOR EXTRUDED PRODUCTS APPLY UNLESS SPECIFIED OTHERWISE

{ · } DENOTES R .031 (12)

H-02651
File Number

Temp. Number

Design Number:

Break Ext., Corners
Radius or as Noted[illegible]

	925005
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Scale	1:1
Date	

07-28-88	Drawn
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4	F.A.S.
meter (in)	Checked S.T.C.

4	0.000
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米

Customer signature on this print indicates approval of design and dimensions as shown, and customer agrees to accept all legal responsibilities for patent infringement. This drawing is the property of Keymark Corporation and may not be redistributed without written consent.

STRUCTURAL STREAKING
IS EXPECTED

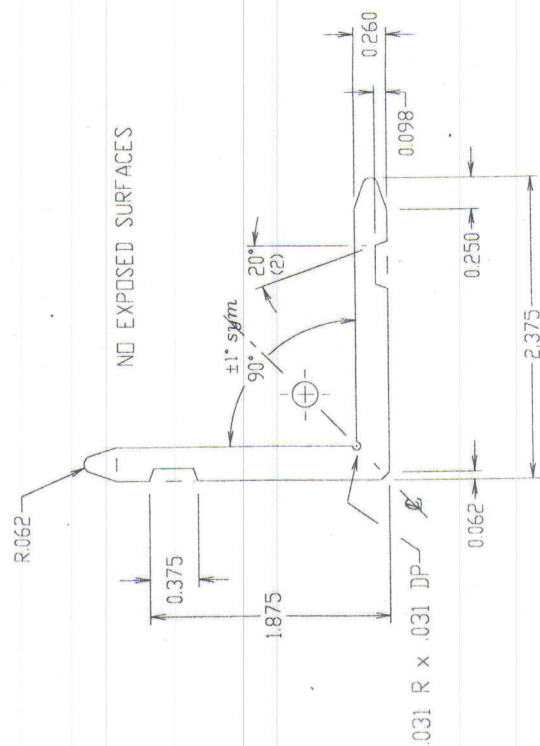
S-13020

Die Number

Temp. Number

Design Number

STANDARD COMMERCIAL TOLERANCES FOR EXTRUDED
PRODUCTS APPLY UNLESS SPECIFIED OTHERWISE



Architectural Product Testing

Report #: 1391.03-106-11

Date: 1/8/2018

By: M. Stremmel

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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 harmless from any claims, suits, actions or demands arising there from.



FAX ENG. (518) 853-3435 SALES (518) 853-3130

TEL. (518) 853-3421 E-MAIL engny@keymarkcorp.com

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

Estimated I _x = 0.505	I _y = 0.505	Alodine	Type 00
Reference S _x = 0.294	S _y = 0.294	Crimp	Factor 8

Mill ☒ Solid ☐ Semi-hollow ☐ Class ☐ Hollow ☐ Class