

**AAMA/WDMA/CSA 101/LS.2/A440-05
TEST REPORT**

Rendered to:

INTERNATIONAL WINDOW CORPORATION

SERIES/MODEL: 6222C EL

PRODUCT TYPE: Aluminum XO Casement Window

Title	Summary of Results
Primary Product Designator	C-R30 2440 x 1831 (96 x 72)
Design Pressure	±1440 Pa (±30.08 psf)
Operating Force (in motion)	4 N (1.0 lbf)
Air Infiltration	0.97 L/s/m ² (0.19 cfm/ft ²)
Water Penetration Resistance Test Pressure	330 Pa (6.89 psf)
Uniform Load Structural Test Pressure	±2160 Pa (±45.11 psf)
Forced Entry Resistance	ASTM F 588 – Grade 10 CAWM 301

Test Completion Date: 02/03/10

Reference must be made to Report No. 98326.01-301-44, dated 04/06/10 for complete test specimen description and data.

AAMA/WDMA/CSA 101/I.S.2/A440-05 TEST REPORT

Rendered to:

INTERNATIONAL WINDOW CORPORATION
5625 East Firestone Boulevard
South Gate, California 90280

Report No.: 98326.01-301-44
Test Dates: 04/24/08
Through: 02/03/10
Report Date: 04/06/10
Expiration Date: 02/03/14

Project Summary: Architectural Testing, Inc. was contracted by International Window Corporation to perform testing on a Series/Model 6220C EL, Aluminum XO Casement Window. The sample tested successfully met the performance requirements for a C-R30 2440 x 1831 (96 x 72) rating. Test specimen description and results are reported herein. The sample was provided by the client.

Test Specification: The test specimen was evaluated in accordance with the following:

AAMA/WDMA/CSA 101/I.S.2/A440-05, Standard/Specification for Windows, Doors, and Unit Skylights.

CAWM 301, Forced Entry Resistance Tests for Windows.

Test Specimen Description:

Series/Model: 6220C EL

Product Type: Aluminum XO Casement Window

Overall Size: 2440 mm (96-1/16") wide by 1831 mm (72-1/16") high

Vent Size: 763 mm (30-1/16") wide by 1796 mm (70-11/16") high

Daylite Opening Size: 1532 mm (60-5/16") wide by 1735 mm (68-5/16") high

Overall Area: 4.47 m² (48.09 ft²)

Test Specimen Description: (Continued)

Finish: All aluminum was mill finished.

Frame Construction: All members were constructed of extruded aluminum. The corners were coped and secured using a metal corner key sealed to the frame with silicone and two #6 x 1" Phillips pan head screws and sealed with seam sealer. The mullion was attached using four #6 x 1" Phillips pan head screws at each end and sealed with seam sealer. A glazing bead extension was employed at all fixed lite members secured with #6 x 3/8" Phillips pan head self-drilling screws 3/4" – 3-3/4" from corner and 11-1/4" – 17" on center. The lock was sealed to the frame with silicone. The operator was sealed to the frame with silicone.

Vent Construction: All members were constructed of extruded aluminum. The corners were mitered and secured using two #8 x 1-1/4" Phillips pan head self-drilling screws. A metal corner key secured with two #8 x 3/4" Phillips pan head self-drilling screws.

Weatherstripping:

<u>Description</u>	<u>Quantity</u>	<u>Location</u>
Single fin gasket	1 Row	Top rail and stiles of the vent.
Rubber gasket	1 Row	All members of frame at the vent.

Glazing Details: The window utilized 3/4" thick overall sealed insulating glass. The vent insulating glass was comprised of two 1/8" thick clear annealed sheets with a U-shaped coated steel dual seal (CU-D) spacer system. The fixed lite was comprised of two 3/16" thick clear annealed sheets with an aluminum (A1) spacer system. The glass was exterior glazed onto 3/8" wide x 1/16" thick glazing tape and secured with a snap-in roll formed aluminum glazing bead. The vent corners and glazing bead were sealed with Dow Corning 995.

Drainage:

<u>Description</u>	<u>Quantity</u>	<u>Location</u>
5/16" round weephole	2	4-1/2" - 4-7/8" from each end of the bottom rail of the vent.

The vertical glazing bead extensions were held back 1/4" from sill at both ends of the fixed lite.

Test Specimen Description: (Continued)

Hardware:

<u>Description</u>	<u>Quantity</u>	<u>Location</u>
Butt Hinges (part #AS6210)	3	5-3/4" from each end and midspan of the frame at the vent secured to the frame with three #8 x 3/4" Phillips flat head self-drilling screws and to vent with three #8 x 3/4" Phillips flat head self-drilling screws.
Roto Operator (part #SP6212 / SP2870 / SP2210)	1	5-1/2" from the jamb at the sill secured through frame with two #10-24 x 3/8" screws and to the vent with two #8 x 3/8" Phillips pan head screws.
Locks (part #SP2818)	2	12" from the head and 14" from the sill secured to the mullion with two #8 x 3/8" Phillips pan head screws.
Keepers (part #SP3038)	2	Opposite the locks secured with two #8 x 3/8" Phillips pan head screws.

Reinforcement: No reinforcement was utilized.

Installation: The window was installed into a 2 x 8 test buck constructed of Douglas Fir No. 2 lumber. The nailing fin was set against the test buck and secured using #6 x 1-5/8" drywall screws located 4" from each corner and 10" on center. The rough opening was 5/16" wider and 1/4" taller than the window. The nailing fin was sealed to the test buck with silicone.

Test Results: The temperature during testing was 20-28°C (68-83°F). The results are tabulated as follows:

<u>Paragraph</u>	<u>Title of Test - Test Method</u>	<u>Results</u>	<u>Allowed</u>
5.3.1	Operating Force per ASTM E 2068		
	<u>Open</u>		
	Initiate motion	18 N (4.0 lbf)	Report Only
	Maintain motion	4 N (1.0 lbf)	30 N (6.7 lbf)
	Upper Latch	31 N (7.0 lbf)	100 N (22.5 lbf)
	Lower Latch	31 N (9.3 lbf)	100 N (22.5 lbf)
	<u>Close</u>		
	Initiate motion	4 N (1.0 lbf)	Report Only
	Maintain motion	4 N (1.0 lbf)	30 N (6.7 lbf)
	Upper Latch	22 N (5.0 lbf)	100 N (22.5 lbf)
	Lower Latch	22 N (5.0 lbf)	100 N (22.5 lbf)
5.3.2.1	Air Leakage Resistance per ASTM E 283 75 Pa (1.57 psf)	0.9 L/s/m ² (0.19 cfm/ft ²)	1.5 L/s/m ² (0.3 cfm/ft ²) max.
<i>Note #1: The tested specimen meets (or exceeds) the performance levels specified in AAMA/WDMA/CSA 101/I.S.2/A440-05 for air leakage resistance.</i>			
5.3.3.2	Water Penetration Resistance per ASTM E 547		See Note #2
<i>Note #2: The client opted to start at a pressure higher than the minimum required. Those results are listed under "Optional Performance".</i>			
5.3.4.2	Uniform Load Deflection per ASTM E 330		See Note #2
5.3.4.3	Uniform Load Structural per ASTM E 330		See Note #2

Test Results: (Continued)

<u>Paragraph</u>	<u>Title of Test - Test Method</u>	<u>Results</u>	<u>Allowed</u>
5.3.5	Forced Entry Resistance per ASTM F 588 Type: B	Grade: 10	
	Disassembly Test	No entry	No entry
	Test B1	No entry	No entry
	Test B2	No entry	No entry
	Test B3	No entry	No entry
	Vent Manipulation Test	No entry	No entry
	Lock Hardware Manipulation Test	No entry	No entry
	Forced Entry Resistance per CAWM 301 Type: II	Grade: 10	
	Disassembly Test	No entry	No entry
	Test A	No entry	No entry
	Test B	No entry	No entry
	Test C	No entry	No entry
	Test E	No entry	No entry
5.3.6.4.3	Sash Vertical Deflection Test 270 N (60.7 lbf)	2.3 mm (0.09")	15.2 mm (0.60") max.
5.3.6.6.2	Distributed Load Test 240 Pa (5.01 psf)	No damage	No damage
<u>Optional Performance</u>			
4.4.2.6	Water Penetration Resistance per ASTM E 547 330 Pa (6.89 psf)	No leakage	No leakage

Test Results: (Continued)

<u>Paragraph</u>	<u>Title of Test - Test Method</u>	<u>Results</u>	<u>Allowed</u>
4.4.2.6	Uniform Load Deflection per ASTM E 330 (Deflections were taken on the mullion) (Loads were held for 10 seconds)		
	1440 Pa (30.08 psf) (positive)	5.5 mm (0.22")	See Note #3
	1440 Pa (30.08 psf) (negative)	6.0 mm (0.24")	See Note #3

***Note #3:** The deflections reported are not limited by AAMA/WDMA/CSA 101/I.S.2/A440-05 for this product designation. The deflection data is recorded in this report for special code compliance and information only.*

4.4.2.6	Uniform Load Structural per ASTM E 330 (Permanent sets were taken on the mullion) (Loads were held for 10 seconds)		
	2160 Pa (45.11 psf) (positive)	0.3 mm (0.01")	7.2 mm (0.28") max.
	2160 Pa (45.11 psf) (negative)	0.0 mm (0.00")	7.2 mm (0.28") max.

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.

Drawing Reference: The test specimen drawings have been reviewed by Architectural Testing and are representative of the test specimen reported herein.

List of Official Observers:

<u>Name</u>	<u>Company</u>
Mason Kelly	Architectural Testing, Inc.
Jeffrey T. Osugi	Architectural Testing, Inc.
Dennis Janzen	Architectural Testing, Inc.
Derek Spencer	Architectural Testing, Inc.

Detailed drawings, data sheets, representative samples of test specimens, a copy of this report, or other pertinent project documentation will be retained by Architectural Testing, Inc. for a period of four years from the original test date. At the end of this retention period, such materials shall be discarded without notice and the service life of this report will expire.

Results obtained are tested values and were secured by using the designated test methods. If test specimen contains glazing, no conclusions of any kind regarding the adequacy or inadequacy of the glass in the test specimen 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.

Jeffrey T. Osugi
Technician

Kenny C. White
Laboratory Manager

JO: ms

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

- Appendix-A: Alteration Addendum (1)
- Appendix-B: Test Equipment (1)
- Appendix-C: Drawings (13)

Revision Log

<u>Rev. #</u>	<u>Date</u>	<u>Page(s)</u>	<u>Revision(s)</u>
0	04/06/10	N/A	Original report issue

Appendix A

Alteration Addendum

- Alteration #1:** Date – 04/28/08
Cause for alteration – Failure during water penetration testing.
Remedial action taken – Re-sealed corners of frame with silicone.
- Alteration #2:** Date – 02/03/10
Cause for alteration – Failure during distributed load testing.
Remedial action taken – Guide track for operator flipped around so open end is towards lock stile.

Appendix B
Test Equipment

Instrument	Manufacturer	Asset #
Operating force gauge	Chatillon	C002322
Control Panel	ATI	Y002213
Control Panel	ATI	Y003301
Spray Rack	ATI	004047
Linear Transducer	Celesco	003431
Linear Transducer	Celesco	005283
Linear Transducer	Celesco	005282
Linear Transducer	Celesco	004486
Linear Transducer	Celesco	003428
Linear Transducer	Celesco	004488
MULE (mini)	ATI	005722
Spring Scale	Pelouze	62406
Load Cell 1K	Interface	62421
Dial Indicator	Ames	003574

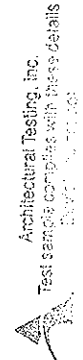
Appendix C

Drawings

3/22/2010 "F"

6222/6223/6282 Casement EL/ER HP

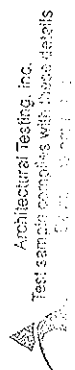
Item #	Part Number	Description	Comments	Vendor	Vendor Part Number	Qty
F1	50104	Head, 1 3/8" offset	6220 ONLY	Intex	50104	1
	50378	Head, 1" offset	6221 ONLY	Intex	50378	
	50116	Head, block	6280 ONLY	Intex	50116	
F2	50104	Sill, 1 3/8" offset	6220 ONLY	Intex	50104	1
	50378	Sill, 1" offset	6221 ONLY	Intex	50378	
	50116	sill, block	6280 ONLY	Intex	50116	
F3	50104	Jamb, 1 3/8" offset	6220 ONLY	Intex	50104	2
	50378	Jamb, 1" offset	6221 ONLY	Intex	50378	
	50116	Jamb, block	6280 ONLY	Intex	50116	
F4	50084	Vertical Mullion		Intex	50084	1
	50433	Top Rail		Intex	50433	
	50433	Bottom Rail		Intex	50433	
S1	50433	Vent Stile		Intex	50433	2
	50085	Extruded Angle Glazing Bead		Intex	50085	
	50544	Corner Keys	1.312"	Intex	50544	
S2	FT2816	Snap In Glazing Bead				8
S3	SP3173	Screen				1
	SP3173	Pointer Clips				
	VY2476	Screen Spline	.185 BLK			
S4	SP2282	Operator Gasket		Truth	30174	1
	AS6210	Butt Hinge	Cork	Advantage		
	SP2870	Operator Track	Less than 4' wide, CM 4' wide and greater, CM	Truth	30175	
S5	50107	Latch Bracket		Intex	50107	2
	SP2818	Latch Keeper		Truth	21087	
	50146	Keeper cover		Intex	50146	
S6	SP6211	Single Arm Op Assy 9 1/2", Rear Mount	Less than 2' wide, CM	Truth	23.00	1
	SP6212	Arm Op Assy 13 1/2", Rear Mount	2' wide and larger, CM	Truth	23.02	
	SP3038	Locking Handle w/ Gasket	CM	Truth	24.25	
SP7	SP2210	Operator Handle		Truth	11454.02	1
	SP6218	Silicone	Joint sealant	Dow	995	
	SP6219	Weid On PVC Glue	Bulb vinyl corners	iPS	4784PT	
SP8	SP6220	Casement Corner Seal	Frame corners			4



9 8 3 2 6 9 8 3 2 0 1 0

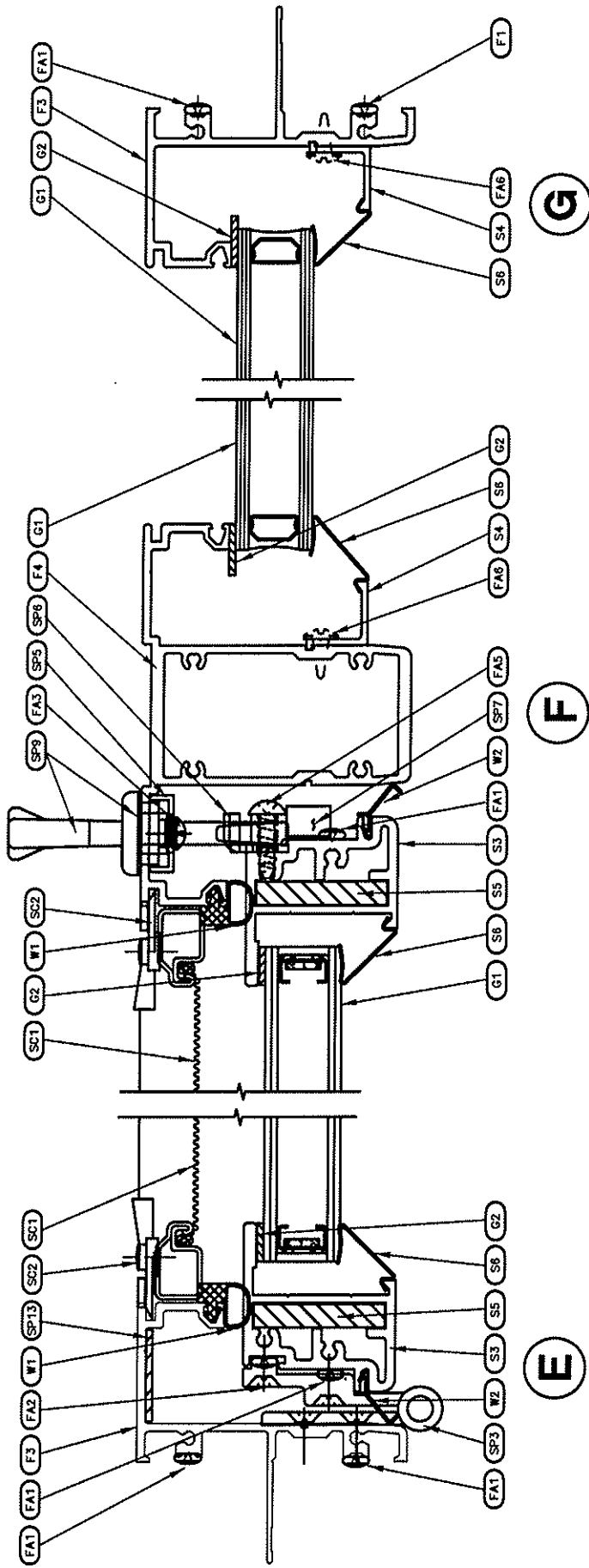
Report# Date Tech

Item #	Part Number	Description	Comments	Vendor	Vendor Part Number	Qty
W1	VY2388B	Bulb vinyl		Bandlock	BL4016	A/R
W2	VY8220	Sash Rainscreen Vinyl	Dual Durometer Weatherstrip	Bandlock	BL4056	A/R
W3						
W4						
G1		3/4" Insulated Glass				2
G2	FT3320	1/16" x 1/2" Glazing Tape				A/R
G3	VY3536	Setting Block/Edge Blocks 4"	1/8" x 13/16" x 4"			7
G4	SP2653	Sealant	Hold setting blocks in place, Seal corners	Schnee- Morehead	5504	A/R
G5	VY2829	3/4" X 7/8" Fixed Setting Block				2
FA1	FA2431	#6 X 1" PH Oval HD SMS	Frame(8), Sash assy(4), Mullion(8)			20
FA2	FA2440	#8 X 3/4" PH Flat HD SMS	Two Hinges, CM			12
FA3	FA2628	#8 X 3/8" PH Truss HD MS	Three Hinges, CM			18
FA4	FA5014	#8 X 1/2" PH Pan HD Tek	Operator(4), Latch bracket(4) Track			8
FA5	FA2878	#8 X 3/4" PH Truss "B"	Keeper			2
FA6	FA2428	#6 x 3/8" PH Pan HD SMS	Fixed Glazing Bead			4
						A/R
LB1	LAB6220C	AAMA Permanent Label				1
LB2	SP4001	NFRC Temporary Label				1
LB3	LAB219	Logo label with instructions				1
LB4	SP4003	Glazing Option Label				1



9 8 3 2 6 ... 0 2 2010

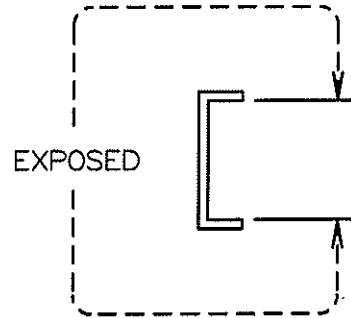
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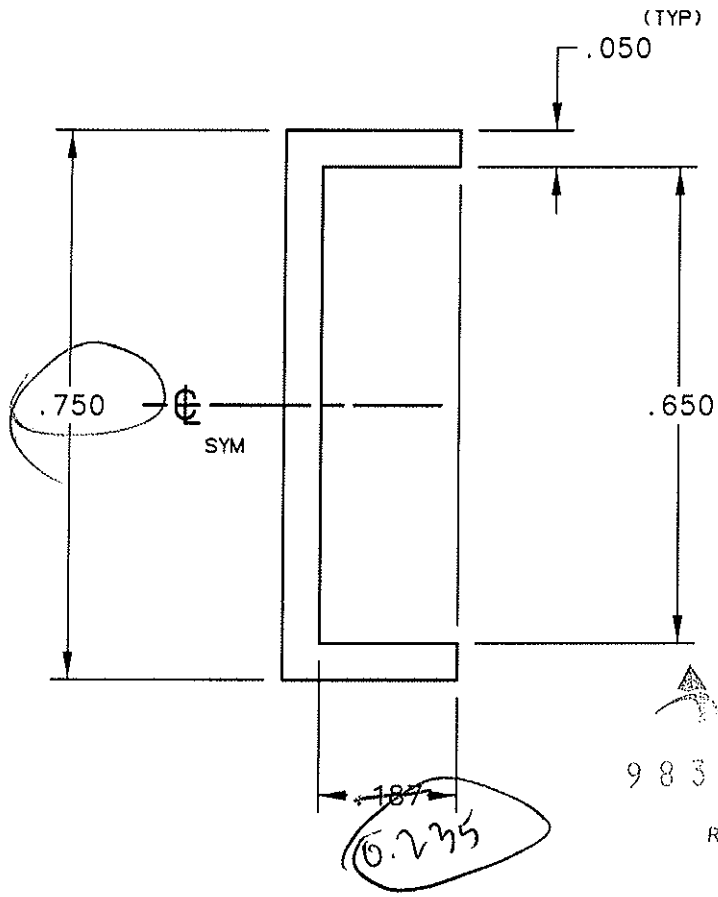
Architectural Testing, Inc.
 Test samples submitted with test results
 98326
 032010
 Report
 Tech
 Data

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				PART NAME ANGLE	DRAWN Willie C.
				PART NO.	DATE 11/24/93
				SCALE 4 X SIZE	CHKD. APP.

STANDARD TOLERANCES FOR EXTRUDED SHAPES APPLY UNLESS SPECIFICALLY SHOWN OTHERWISE



ACTUAL SIZE



Architectural Testing, Inc.
Test sample complies with these details
9 8 3 2 6 0 3 2 0 1 0
Report# Date
Tech *JP*

- CA
- TX



International Extrusion Corporation

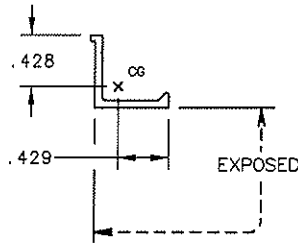
1000 MERIDIAN ALHAMBRA, CALIF.
TEL. 576-2424 AREA CODE: 626

UNLESS OTHERWISE NOTED, ALL CORNERS ARE .015 R, AND TYPICAL WALL THICKNESS IS .050

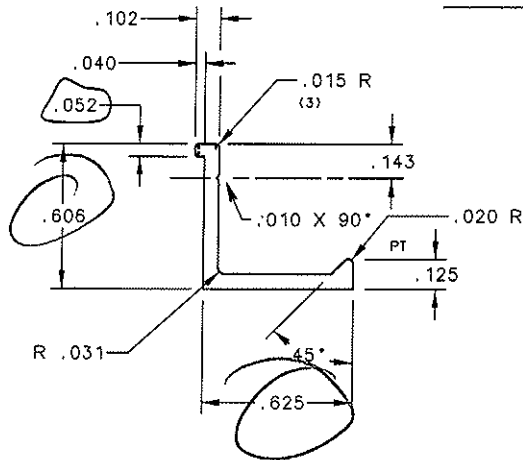
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EST. PERI: 2.348	CLASS. SOLID	BOLSTER. 8 - 2
FACTOR : 35	ER-6 67	DIE NO. 50107

SYM	REVISION	BY	DATE	CUSTOMER	DIE NO.
1	PAINT PERIMETER ADDED	MO	5/15/00	INTERNATIONAL WINDOW CORP.	50085
				PART NAME	DATE
				GLAZING BEAD	08/02/93
				SCALE	2X SIZE
				CHKD.	APP.

STANDARD TOLERANCES FOR EXTRUDED SHAPES APPLY UNLESS SPECIFICALLY SHOWN OTHERWISE



ACTUAL SIZE



PAINT PERI- .771

- CA
- TX



International Extrusion Corporation
 1000 MERIDIAN ALHAMBRA, CALIF.
 TEL. 576-2424 AREA CODE: 626

UNLESS OTHERWISE NOTED, ALL CORNERS ARE .015 R, AND TYPICAL WALL THICKNESS IS .062

EST. AREA: .078	P-NO. P-21980	PORTS 6
EST. WT/FT: .094	CIRCLE SIZE 1.000 IN.	BACKER 8 X STD-6
EST. PERI: 2.595	GLASS. SOLID	BOLSTER 6 - 1
FACTOR: 28	ER-6 * 64	DIE NO. 50085



Architectural Testing, Inc.
 Test sample complies with the
 Deviations are noted

9 8 3 2 6

MAR 08 2010

Report#

Date

Tech

[Signature]

INTERNATIONAL WINDOW CORP.
 1000 MERIDIAN ALHAMBRA, CALIF.
 TEL. 576-2424 AREA CODE: 626



EST. AREA: 1.307	P-NO. IW-116	PORTS WP 4582
EST. WT/FT: 1.568	CIRCLE SIZE 4.400	IN. BACKER 8 X 4582
EST. PERI: 12.603	CLASS. SOLID	BOLSTER. 1 - 57
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UNLESS OTHERWISE NOTED, ALL CORNERS ARE .015 R, AND TYPICAL WALL THICKNESS IS

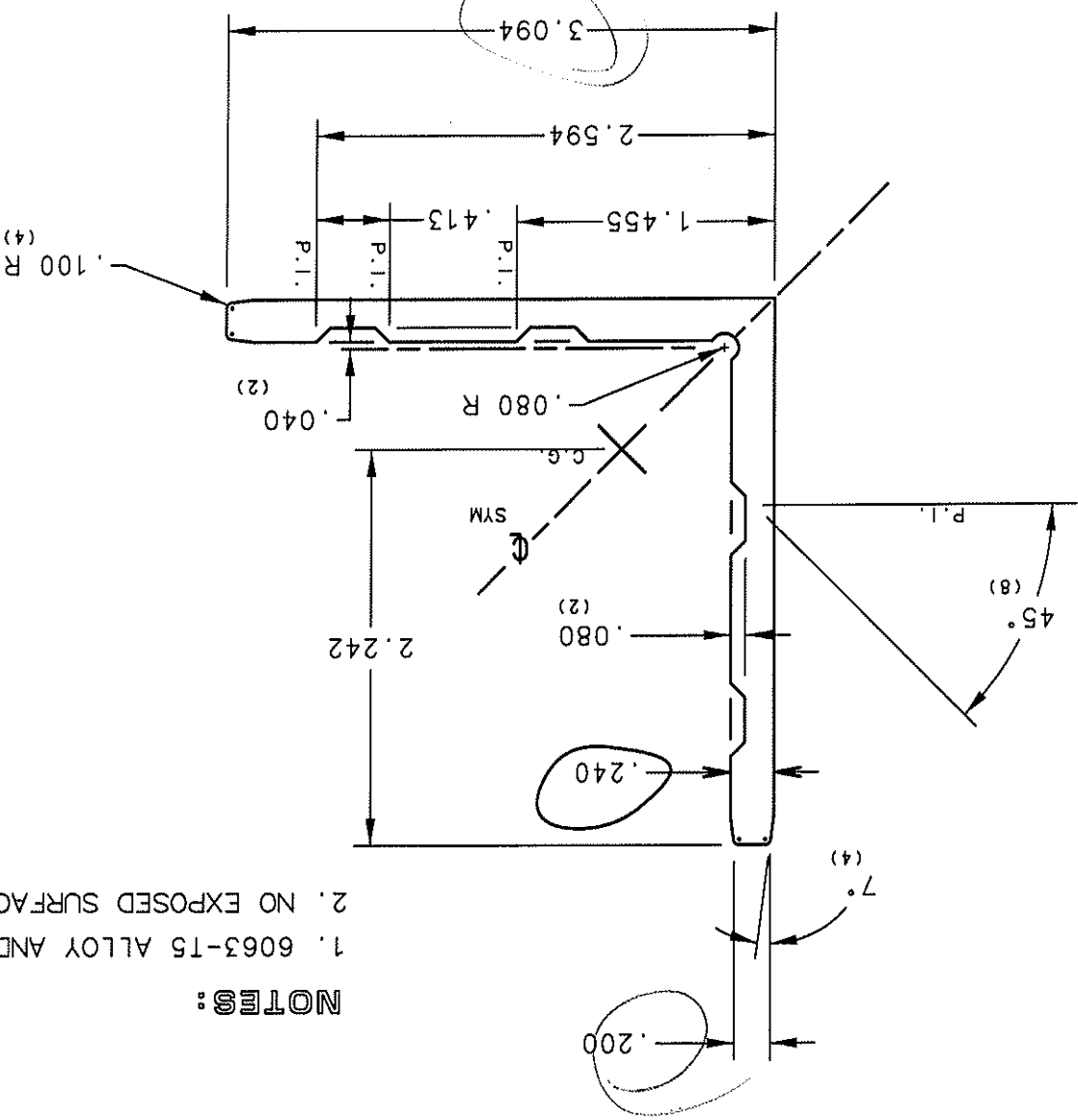
CA
 TX

Architectural Testing, Inc.
 Test sample complies with these details

98326

2010

Tech



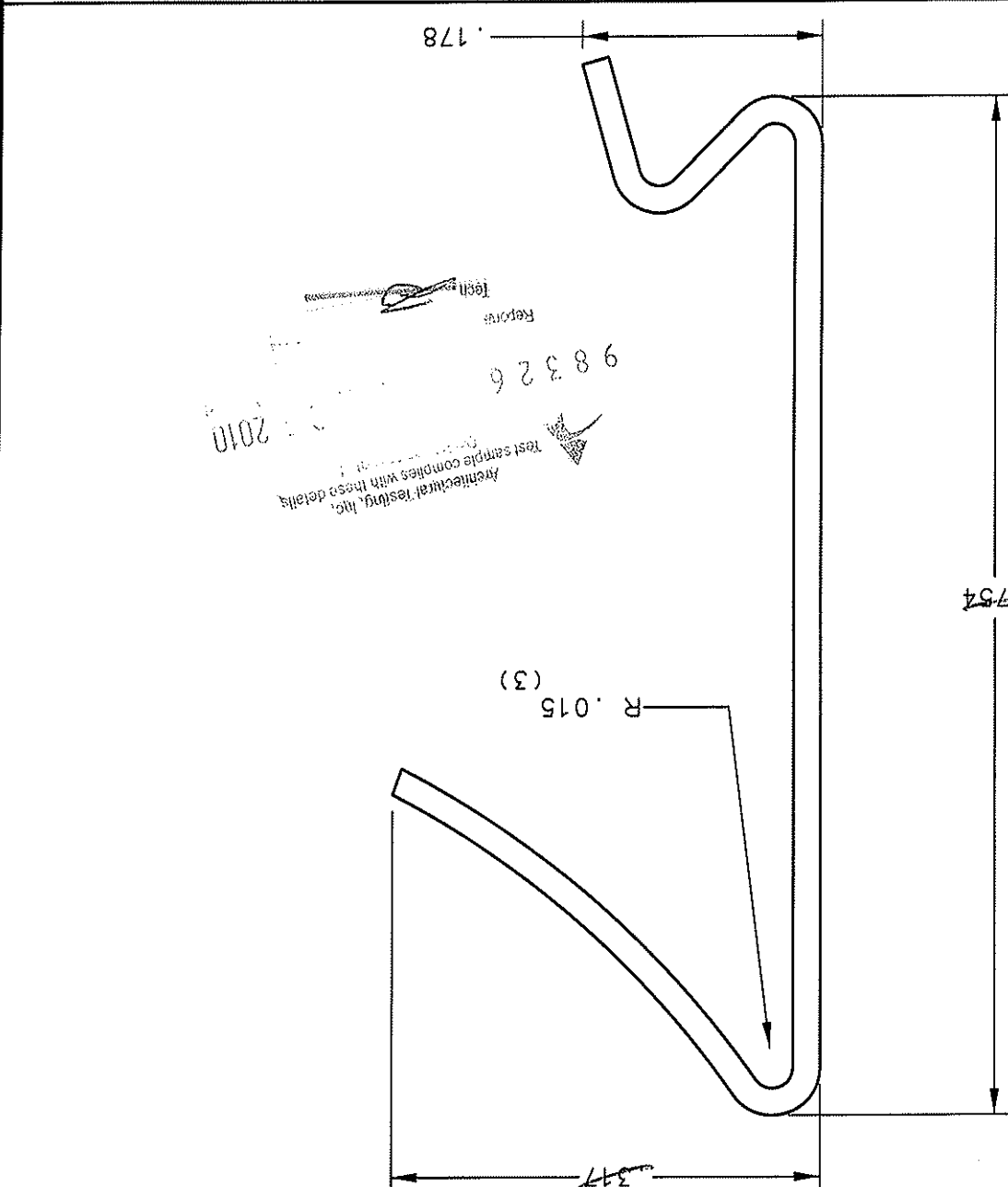
NOTES:
 1. 6063-T5 ALLOY AND TEMPER
 2. NO EXPOSED SURFACE

STANDARD TOLERANCES FOR EXTRUDED SHAPES APPLY UNLESS SPECIFICALLY SHOWN OTHERWISE

SYM	REVISION	BY	DATE	CUSTOMER
				INTERNATIONAL WINDOW CORP.
				DIE NO. 50544
				PART NAME SERIES 6222C CORNER KEY
				DRAWN LMH
				DATE 04/05/2005
				CHKD. APP.
				PART NO.
				SCALE
				FULL SIZE

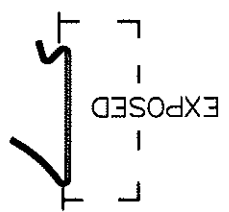
6220c-55	GLAZING BEAD SERIES 6220C/A	SCALE: 8 X SIZE
		DATE: 09/08/03
DWG NO.		DRWN BY: W WONG

International Aluminum Corporation
DIVISION INTERNATIONAL WINDOW CORPORATION



0.635

ACTUAL SIZE



- NOTES:**
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 2. AREA: 0.027
 3. PART # FT2816
 4. TYPICAL THICKNESS 0.020

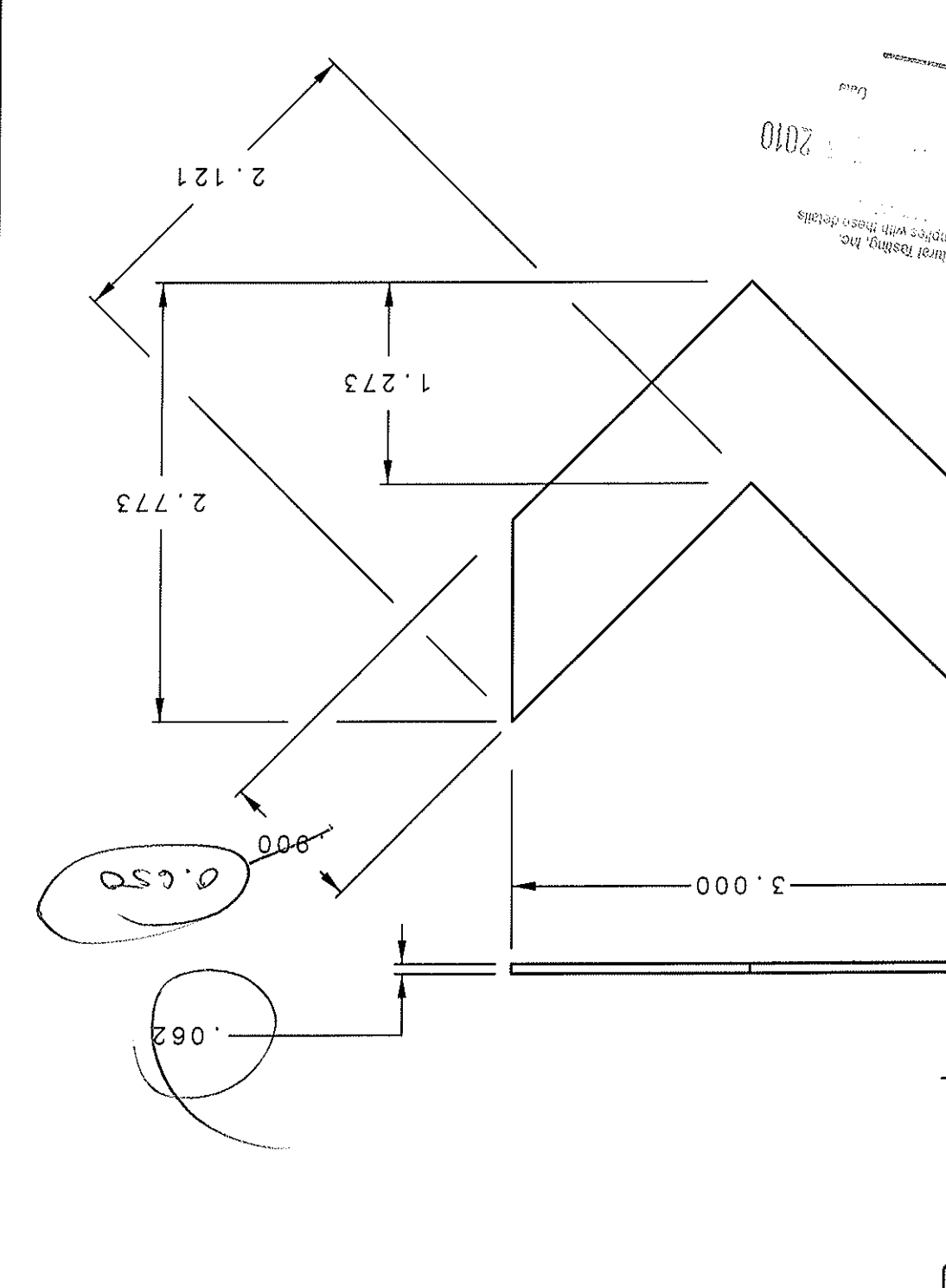
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Reports:
 98326
 Test sample complies with these details
 Architectural Testing, Inc.
 2-2-2010

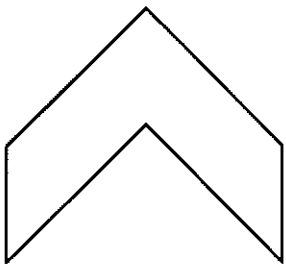
6220c-55

DWG NO. 6220c-66c	CASEMENT CORNER SEAL PART NO. SP6220 (SERIES 6220)	SCALE: 2 X SIZE
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		DRWN BY: LMH

International Aluminum Corporation
DIVISION
INTERNATIONAL WINDOW CORPORATION



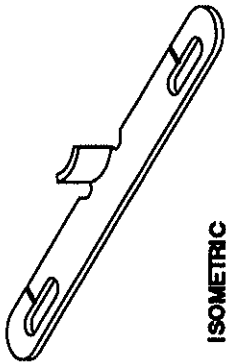
ACTUAL SIZE



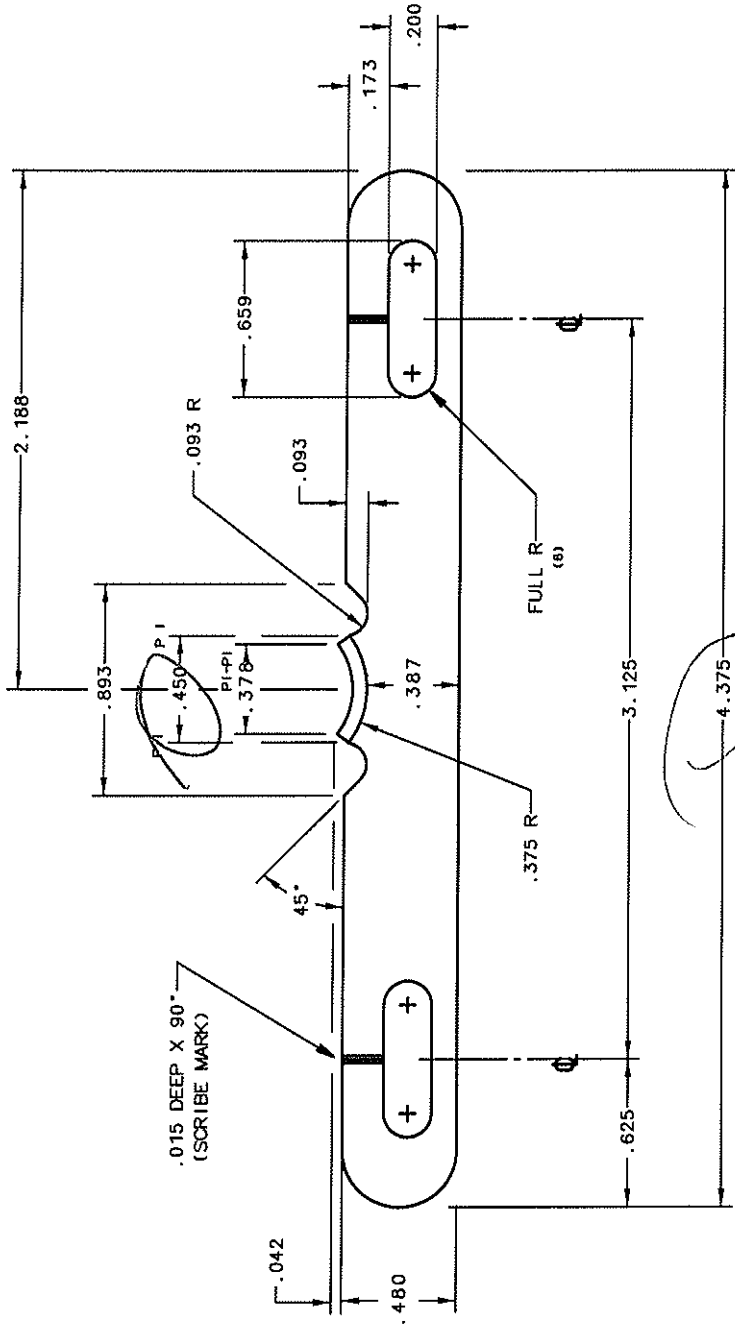
NOTES:

1. MATERIAL: 5052 ALUMINUM MILL FINISH

6220c-66c



ISOMETRIC



NOTES:

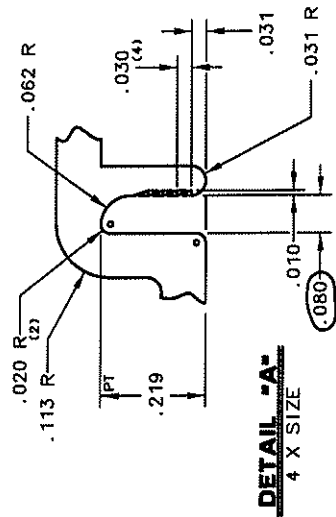
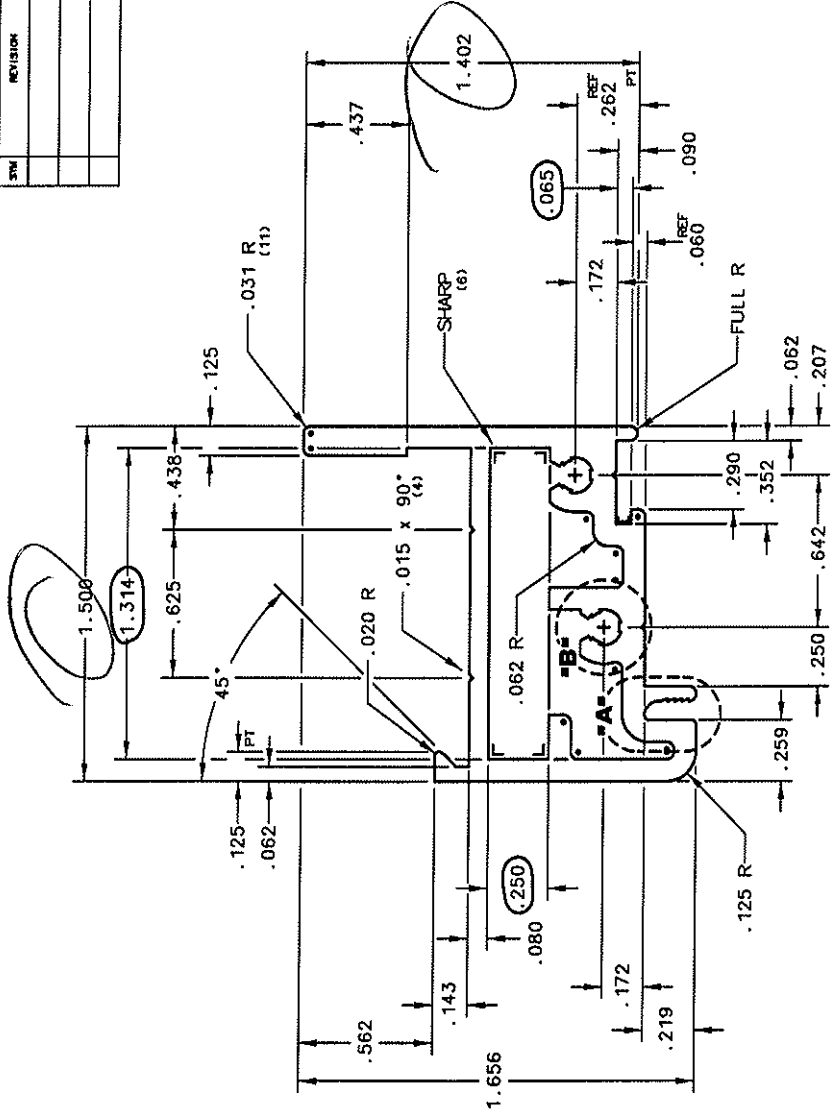
- 1) UNLESS OTHERWISE SPECIFIED ALL DIM'S TO APPLY AT BOTH END'S OF PART.
- 2) USE STANDARD SHOP TOLERANCE FOR ALL DIM'S SHOWN UNLESS OTHERWISE SPECIFIED.
- 3) MATERIAL: 1050 STEEL ROCKWELL C47 AND 300 SERIES STAINLESS
- 4) FINISH: ZINC PLATE ON 1050 STEEL.
- 5) PART NUMBER SP2818.

International Aluminum Corporation		INTERNATIONAL WINDOW CORPORATION		DWG NO. 6220C-31D	
DIVISION		KEEPER		(SERIES 6220) (CASEMENT/AWNING WINDOW)	
DATE	BY	DATE	BY	SCALE: 2X SIZE	
11/23 2004	LMH	11/23 2004	LMH	WILLIAMS/COZIO	
11/23 2004	LMH	11/23 2004	LMH	DATE: 10/04/94	
11/23 2004	LMH	11/23 2004	LMH	DATE: 10/04/94	

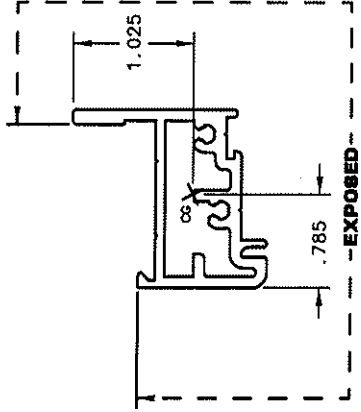
Architectural Testing, Inc.
Test sample number: 98526
98526
2010
Report:
Tech AP

REV	REVISION	DATE	CUSTOMER	DIE NO.
INT	INTERNATIONAL WINDOW			50433
STW				
DATE				
PART NAME	6222 HP SASH	DATE	PRESTON	9/17/02
PART NO.		SCALE	2 X SIZE	

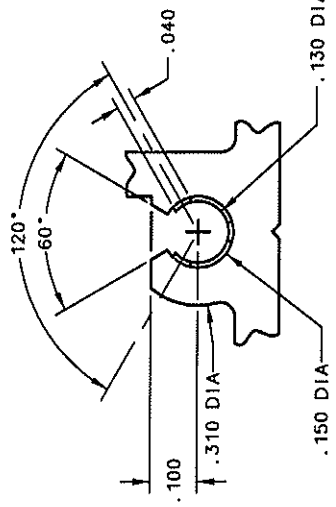
STANDARD TOLERANCES FOR EXTRUDED SHAPES APPLY UNLESS SPECIFICALLY SHOWN OTHERWISE



DETAIL "A"
4 X SIZE



ACTUAL SIZE



DETAIL "B"
4 X SIZE (2 PL)

NOTES:
1. 6063-T5 ALLOY AND TEMPER



International Extrusion Corporation
1000 MERIDIAN ALHAMBRA, CALIF.
TEL. 576-2424 AREA CODE 628

UNLESS OTHERWISE NOTED, ALL CORNERS ARE .015 R, AND TYPICAL WALL THICKNESS IS .093	EST. AREA: .606	P.M.O. C-716	PORTS
	EST. W./FT: .727	CIRCLE SIZE 2.170 IN.	BACKER
	EST. PERI: 13.187	GLASS: 11 HOLLOW	BLASTER
	FACTOR: 18	BR:	DIE NO. 50433

98326

2010

Report: 
Tech: 