

**NFRC 102-2010 THERMAL PERFORMANCE  
TEST REPORT**

**Rendered to:**

**CRAWFORD TRACEY CORPORATION**

**SERIES/MODEL: Pro-Tech 7 SG IG**

**TYPE: Glazed Wall System**

<b>Summary of Results</b>	
Standardized Thermal Transmittance (U-Factor)	0.34
Unit Size	78-3/4" x 78-3/4" (2000mm x 2000mm)
Layer 1	1/4" Viracon VE1-2M (e=0.040*, #2) Tempered
Gap 1	0.50" Gap, Aluminum Spacer (A1-D), Air-Filled*
Layer 2	1/2" (1/4" Clear / 0.060 PVB / 1/4" Clear) Laminated

Reference must be made to Report No. 99724.01-116-46, dated 04/23/10 for complete test specimen description and data.

**NFRC 102-2010 THERMAL PERFORMANCE TEST REPORT**

Rendered to:

CRAWFORD TRACEY CORPORATION  
3301 SW 13th Drive  
Deerfield Beach, Florida 33442

Report Number: 99724.01-116-46  
Test Date: 04/17/10  
Report Date: 04/23/10  
Expiration Date: 04/17/14

**Test Sample Identification:**

**Series/Model:** Pro-Tech 7 SG IG

**Type:** Glazed Wall System

**Overall Size:** 78-3/4" x 78-3/4" (2000mm x 2000mm)

**NFRC Standard Size:** 78.7" x 78.7" (2000 mm wide x 2000 mm high)

**Test Sample Submitted by:** Client

**Test Sample Submitted for:**

**Test Procedure:** U-factor tests were performed in a Guarded Hot Box in accordance with NFRC 102-2010, *Test Procedure for Measuring the Steady-State Thermal Transmittance of Fenestration Systems*.

**Test Results Summary:**

Standardized U-factor ( $U_{st}$ ): 0.34 Btu/hr·ft<sup>2</sup>·F CTS Method

**Test Sample Description:**

<b>CONSTRUCTION</b>	<b>Frame</b>
Size (in.)	78-3/4" x 78-3/4"
Daylight Opening (in.)	35-5/8" x 74-3/4" (x2)
<b>CORNERS</b>	<b>Butt</b>
Fasteners	Screws
Sealant	No
<b>MATERIAL</b>	<b>AT (0.25")</b>
Color Exterior	Gray
Finish Exterior	Anodized
Color Interior	Gray
Finish Interior	Anodized
<b>GLAZING METHOD</b>	<b>Exterior Structurally Glazed</b>

**Glazing Information:**

<b>Layer 1</b>	1/4" Viracon VE1-2M (e=0.040*, #2) Tempered
<b>Gap 1</b>	0.50" Gap, Aluminum Spacer (A1-D), Air-Filled*
<b>Layer 2</b>	1/2" (1/4" Clear / 0.060 PVB / 1/4" Clear) Laminated
<b>Gas Fill Method</b>	N/A*

*\*Stated per Client/Manufacturer*

*N/A Non-Applicable*

*See Description Table Abbreviations*

**Test Sample Description:** (Continued)

<b>COMPONENTS</b>		
<b>Type</b>	<b>Quantity</b>	<b>Location</b>
<b>WEATHERSTRIP</b>		
Foam gasket	2 rows	Exterior glazing perimeter
EPDM gasket	1 row	Interior glazing perimeter
<b>HARDWARE</b>		
End caps	6	Two per head and sill, one per jambs at exterior frame perimeter
Interior trim/insert	6	Two per interior head and sill, one per jambs
3-1/2" Applied trim	1	Exterior center mullion
1-5/8" Applied trim	6	Two per exterior head and sill, one per jambs
<b>DRAINAGE</b>		
No visible weeps		

## Thermal Transmittance (U-factor)

### Measured Test Data

#### Heat Flows

1. Total Measured Input into Metering Box ( $Q_{total}$ )	1151.55 Btu/hr
2. Surround Panel Heat Flow ( $Q_{sp}$ )	48.32 Btu/hr
3. Surround Panel Thickness	8.00 inches
4. Surround Panel Conductance	0.0261 Btu/hr-ft <sup>2</sup> -F
5. Metering Box Wall Heat Flow ( $Q_{mb}$ )	40.11 Btu/hr
6. EMF vs Heat Flow Equation (equivalent information)	0.0196*EMF + 0.020
7. Flanking Loss Heat Flow ( $Q_{fl}$ )	17.90 Btu/hr
8. Net Specimen Heat Loss ( $Q_s$ )	1045.22 Btu/hr

#### Areas

1. Test Specimen Projected Area ( $A_s$ )	42.66 ft <sup>2</sup>
2. Test Specimen Interior Total (3-D) Surface Area ( $A_h$ )	67.92 ft <sup>2</sup>
3. Test Specimen Exterior Total (3-D) Surface Area ( $A_c$ )	49.14 ft <sup>2</sup>
4. Metering Box Opening Area ( $A_{mb}$ )	69.44 ft <sup>2</sup>
5. Metering Box Baffle Area ( $A_{b1}$ )	60.74 ft <sup>2</sup>
6. Surround Panel Interior Exposed Area ( $A_{sp}$ )	26.78 ft <sup>2</sup>

#### Test Conditions

1. Average Metering Room Air Temperature ( $t_h$ )	69.80 F
2. Average Cold Side Air Temperature ( $t_c$ )	-0.41 F
3. Average Guard/Environmental Air Temperature	71.25 F
4. Metering Room Average Relative Humidity	9.18 %
5. Measured Cold Side Wind Velocity (Perpendicular Flow)	17.07 mph
6. Measured Static Pressure Difference Across Test Specimen	0.00" $\pm$ 0.04"H <sub>2</sub> O

#### Results

1. Thermal Transmittance of Test Specimen ( $U_s$ )	0.35 Btu/hr-ft <sup>2</sup> -F
2. Standardized Thermal Transmittance of Test Specimen ( $U_{st}$ )	0.34 Btu/hr-ft <sup>2</sup> -F

## Thermal Transmittance (U-factor)

### Calculated Test Data

#### CTS Method

1. Emittance of Glass ( $e_1$ )	0.84
2. Warm Side Baffle Emittance ( $e_{b1}$ )	0.92
3. Equivalent Warm Side Surface Temperature	51.45 F
4. Equivalent Cold Side Surface Temperature	4.13 F
5. Warm Side Baffle Surface Temperature	68.71 F
6. Measured Warm Side Surface Conductance ( $h_h$ )	1.34 Btu/hr·ft <sup>2</sup> ·F
7. Measured Cold Side Surface Conductance ( $h_c$ )	5.40 Btu/hr·ft <sup>2</sup> ·F
8. Test Specimen Thermal Conductance ( $C_s$ )	0.52 Btu/hr·ft <sup>2</sup> ·F
9. Convection Coefficient ( $K_c$ )	0.31 Btu/(hr·ft <sup>2</sup> ·F <sup>1.25</sup> )
10. Radiative Test Specimen Heat Flow ( $Q_{r1}$ )	554.36 Btu/hr
11. Conductive Test Specimen Heat Flow ( $Q_{c1}$ )	490.86 Btu/hr
12. Radiative Heat Flux of Test Specimen ( $q_{r1}$ )	13.00 Btu/hr·ft <sup>2</sup> ·F
13. Convective Heat Flux of Test Specimen ( $q_{c1}$ )	11.51 Btu/hr·ft <sup>2</sup> ·F
14. Standardized Warm Side Surface Conductance ( $h_{sth}$ )	1.20 Btu/hr·ft <sup>2</sup> ·F
15. Standardized Cold Side Surface Conductance ( $h_{stc}$ )	5.28 Btu/hr·ft <sup>2</sup> ·F
16. Standardized Thermal Transmittance ( $U_{st}$ )	0.34 Btu/hr·ft <sup>2</sup> ·F

#### Test Duration

1. The environmental systems were started at 14:55 hours, 04/16/10.
2. The test parameters were considered stable for two consecutive four hour test periods from 02:11 hours, 04/17/10 to 10:11 hours, 04/17/10.
3. The thermal performance test results were derived from 06:11 hours, 04/17/10 to 10:11 hours, 04/17/10.

The reported Standardized Thermal Transmittance ( $U_{st}$ ) was determined using CTS Method, per Section 8.2(A) of NFRC 102.

**Glazing Deflection (in):**

	<b>Left Glazing</b>	<b>Right Glazing</b>
Edge Gap Width	0.50	0.50
Estimated center gap width upon receipt of specimen in laboratory (after stabilization)	0.56	0.38
Center gap width at laboratory ambient conditions on day of testing	0.56	0.38
Center gap width at test conditions	0.47	0.34

The sample was inspected for the formation of frost or condensation, which may influence the surface temperature measurements. The sample showed no evidence of condensation/frost at the conclusion of the test.

A calibration of the Architectural Testing Inc. 'thermal test chamber' (ICN 000001) in York, Pennsylvania was conducted in April 2009 in accordance with Architectural Testing Inc. calibration procedure.

"This test method does not include procedures to determine the heat flow due to either air movement through the specimen or solar radiation effects. As a consequence, the thermal transmittance results obtained do not reflect performances which may be expected from field installations due to not accounting for solar radiation, air leakage effects, and the thermal bridge effects that may occur due to the specific design and construction of the fenestration system opening. Therefore, it should be recognized that the thermal transmittance results obtained from this test method are for ideal laboratory conditions and should only be used for fenestration product comparisons and as input to thermal performance analyses which also include solar, air leakage and thermal bridge effects."

"Ratings included in this report are for submittal to an NFRC-licensed IA for certification purposes and are not meant to be used for labeling purposes. Only those values identified on a valid Certification Authorization Report (CAR) are to be used for labeling purposes."

The test sample was installed in a vertical orientation, the exterior of the specimen was exposed to the cold side. The direction of heat transfer was from the interior (warm side) to the exterior (cold side) of the specimen.

ANSI/NCSL Z540-2-1997 type B uncertainty for this test was 1.63%.

Detailed drawings, data sheets, representative samples of the test specimens, a copy of this report, or other pertinent project documentation will be retained by Architectural Testing, Inc. until 4/17/2014. At the end of this retention period such materials shall be discarded without notice and the service life of this report by Architectural Testing, Inc. will expire.

Results obtained are tested values and were secured by using the designated test methods. This report does not constitute certification of this product nor an opinion or endorsement by this laboratory. Ratings included in this report are for submittal to an NFRC licensed IA for certification purposes and are not meant to be used for labeling purposes. Only those values identified on a valid Certification Authorization Report (CAR) are to be used for labeling purposes. 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.

Tested By:

Reviewed By:

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Ryan P. Moser  
Technician

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Shon W. Einsig  
Senior Technician  
Individual-In-Responsible-Charge

RPM:kmm  
99724.01-116-46

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

Appendix-A: Description Table Abbreviations (1)

Appendix-B: Submittal Form and Drawings (11)



### Revision Log

<u>Rev. #</u>	<u>Date</u>	<u>Page(s)</u>	<u>Revision(s)</u>
.01R0	04/23/10	All	Original Report Issue. Work requested by Kevin Hansen of Crawford Tracey Corporation

**Appendix A: Description Table Abbreviations**

CODE	Frame / Sash Types
AI	Aluminum w/ Vinyl Inserts (Caps)
AL	Aluminum
AP	Aluminum w/ Thermal Breaks - Partial
AS	Aluminum w/ Steel Reinforcement
AT	Aluminum w/ Thermal Breaks - All Members (> 0.21")
AU	Aluminum Thermally Improved - All Members (0.062" - 0.209")
AV	Aluminum / Vinyl Composite
AW	Aluminum-clad Wood
FG	Fiberglass
PA	ABS Plastic w/ All Members Reinforced
PC	ABS Plastic-clad Aluminum
PF	ABS Plastic w/ Foam-filled Insulation
PH	ABS Plastic w/ Horizontal Members Reinforced
PI	ABS Plastic w/ Reinforcement - Interlock
PL	ABS Plastic
PP	ABS Plastic w/ Reinforcement - Partial
PV	ABS Plastic w/ Vertical Members Reinforced
PW	ABS Plastic-clad Wood
ST	Steel
VA	Vinyl w/ All Members Reinforced
VC	Vinyl-clad Aluminum
VF	Vinyl w/ Foam-filled Insulation
VH	Vinyl w/ Horizontal Members Reinforced
VI	Vinyl w/ Reinforcement - Interlock
VP	Vinyl w/ Reinforcement - Partial
VV	Vinyl w/ Vertical Members Reinforced
VW	Vinyl-clad Wood
VY	Vinyl
WA	Aluminum / Wood composite
WD	Wood
WV	Vinyl / Wood composite
WF	Fiberglass/Wood Combination
WC	Composite/Wood Composite (Shaped vinyl/wood composite members)
CW	Copper Clad Wood
CO	Vinyl/Wood Composite Material

DOOR DETAILS	
N	Not Applicable
CODE	Door Type
EM	Embossed
FL	Flush
LF	Full Lite
LH	1/2 - Lite
LQ	1/4 - Lite
LT	3/4 - Lite
RP	Raised Panel
CODE	Skin
AL	Aluminum
FG	Fiberglass
GS	Galvanized Steel
ST	Steel
WD	Wood
VY	Vinyl
CODE	Panel
FG	Fiberglass
PL	Plastic
WP	Wood - Plywood
WS	Wood - Solid
CODE	Sub-Structure
GS	Galvanized Steel
ST	Steel
WD	Wood
VY	Vinyl
CODE	Core Fill
CH	Cellular - Honeycomb
EP	Expanded Polystyrene
PI	Polyisocyanurate
PU	Polyurethane
WP	Wood - Plywood
WS	Wood - Solid
XP	Extruded Polystyrene

CODE	Spacer Types (See sealant)
A1	Aluminum
A2	Aluminum (Thermally-broken)
A3	Aluminum-reinforced Polymer
A4	Aluminum / Wood
A5	Aluminum-reinforced Butyl (Swiggle)
A6	Aluminum / Foam / Aluminum
A7	Aluminum U-shaped
A8	Aluminum-Butyl (Corrugated) (Duraseal)
ER	EPDM Reinforced Butyl
FG	Fiberglass
GL	Glass
OF	Organic Foam
P1	Duralite
PU	Polyurethane Foam
SU	Stainless Steel, U-shaped
CU	Coated Steel, U-shaped (Intercept)
S2	Steel (Thermally-broken)
S3	Steel / Foam / Steel
S5	Steel-reinforced Butyl
S6	Steel U-channel w/ Thermal Cap
SS	Stainless Steel
CS	Coated Steel
TP	Thermo-plastic
WD	Wood
ZE	Elastomeric Silicone Foam
ZF	Silicone Foam
ZS	Silicone / Steel
N	Not Applicable
TS	Thermo-plastic w/ stainless steel substrate

CODE	Tint Codes
AZ	Azurlite
BL	Blue
BZ	Bronze
CL	Clear
EV	Evergreen
GD	Gold
GR	Green
GY	Gray
LE	Low 'e' Coating
OT	Other (use comment field)
RC	Solar or Reflective Coating
RG	Roller Shades between glazing
RS	Silver (reflective coating)
SF	Suspended Polyester Film
SR	Silver
BG	Blinds between the Glazing
DV	Dynamic Glazing-Variable
DY	Dynamic Glazing-NonVariable

CODE	Gap Fill Codes
AIR	Air
AR2	Argon/Krypton Mixture
AR3	Argon / Krypton / Air
ARG	Argon/Air
CO2	Carbon Dioxide
KRY	Krypton/Air
SF6	Sulfur Hexafluoride
XE2	Xenon/Krypton/Air
XE3	Xenon/Argon/Air
XEN	Xenon/Air
N	Not Applicable

CODE	Spacer Sealant
D	Dual Seal Spacer System
S	Single Seal Spacer System

CODE	Grid Description
N	No Muntins
G	Grids between glass
S	Simulated Divided Lites
T	True Muntins

CODE	Grid Size Codes
	Blank for no grids
0.75	Grids < 1"
1.5	Grids >= 1"

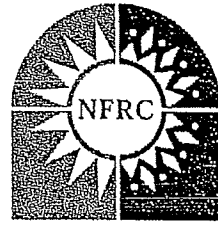
CODE	Thermal Breaks
F	Foam
U	Urethane
V	Vinyl
FB	Fiberglass
O	Other
AB	ABS
NE	Neoprene
AI	Air
N	Not Applicable
P	Polyamide

**Appendix B: Submittal Form and Drawings**

**NFRC PRODUCT CERTIFICATION PROGRAM**

**Submittal Form for Test Samples**

For use by manufacturers, lineal suppliers and fabricators



National Fenestration  
Rating Council®

1. Information on Production of the Test Sample (complete ALL fields):

Manufacturer: CRAWFORD-TRACEY CORP. Date of sample manufacture: 3/29/10

Plant Address where manufactured: 3301 SW 13 DRIVE

City: DEERFIELD BEACH State: FLORIDA Zip Code: 33442

Name of IA: KEVIN HANSEN Phone: 954-698-6888 Fax: 954-698-6889

2. Product Information (complete ALL fields):

Product Line ID (CPD) No.: NEW Product/Operator Type (Table 4-3 of NFRC 100): CURTAIN WALL

Series/Model: PRO-TECH 7 SG IG

3. Test sample is being submitted for (select ONE):

- a.  Validation for Initial Certification (prototype only) no plant qualification
- b.  Validation for Initial Certification (production line unit) & plant qualification
- c.  Validation for Recertification (production line unit) & plant qualification
- d.  Plant Qualification Only (production line unit)

I, KEVIN HANSEN, as the designated agent for CRAWFORD-TRACEY CORP

do hereby attest that the foregoing information is true to the best of my information, knowledge, and belief. Further, if the unit is identified in Section 3 as a production line unit, I hereby authorize the NFRC-accredited testing laboratory to send a copy of the test report to the IA identified above for plant qualification purposes pursuant to the NFRC Product Certification Program..

Signature: [Signature] Date: April 2, 2010

**FOR LABORATORY USE ONLY**

- 1. Laboratory: Architectural Testing
- 2. Date Sample Received: 4/7/10 File number ID: 99724
- 3. Date Sample Tested: 4/17/10 By: KPM
- 4. Modifications made: \_\_\_\_\_

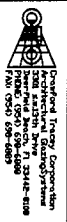
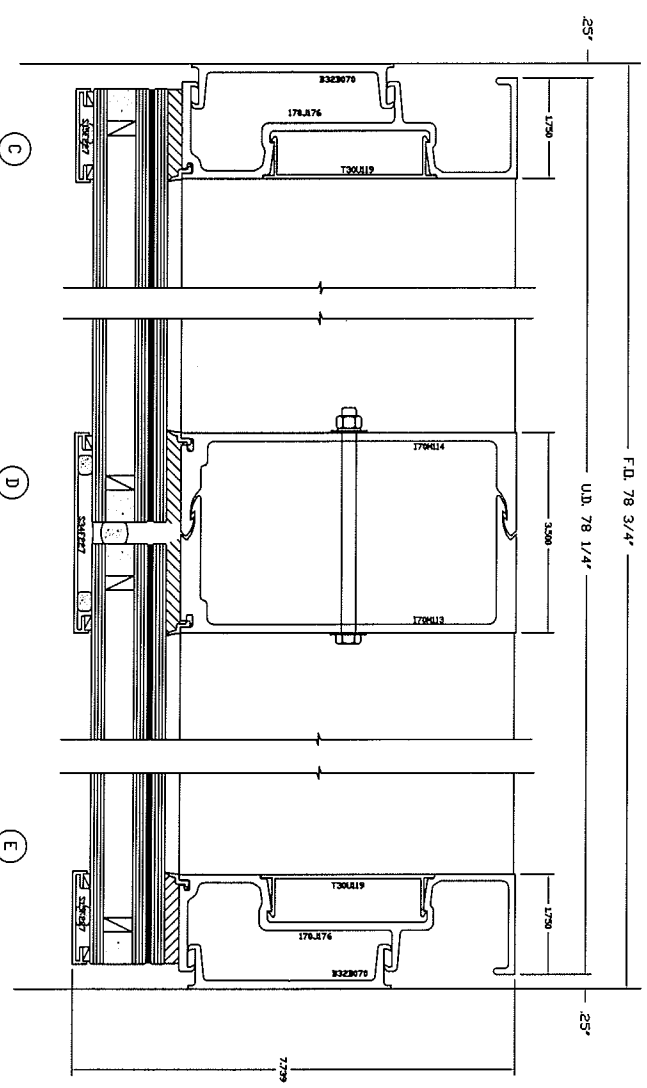
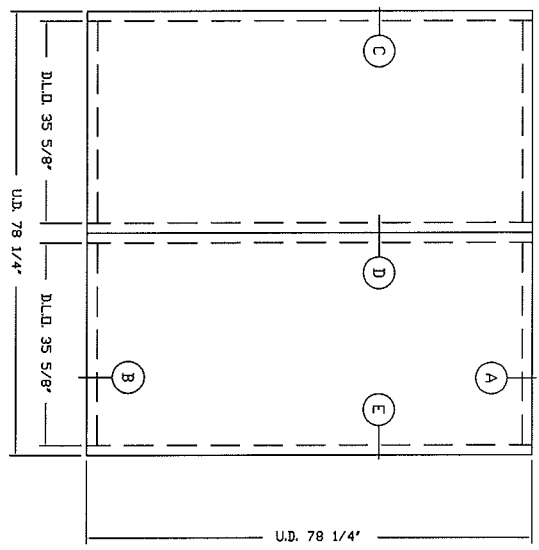
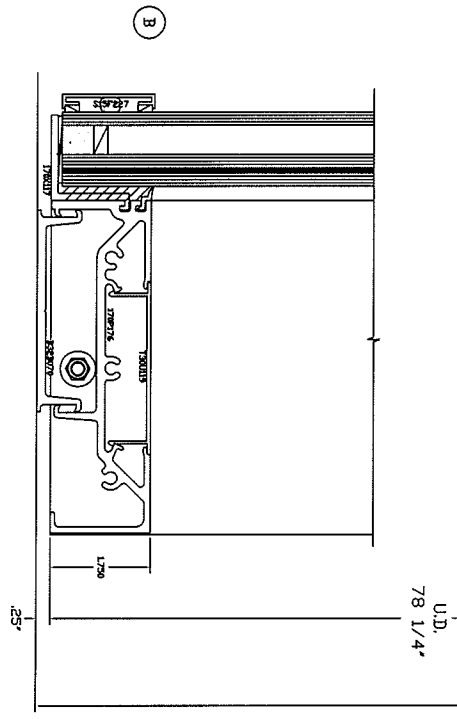
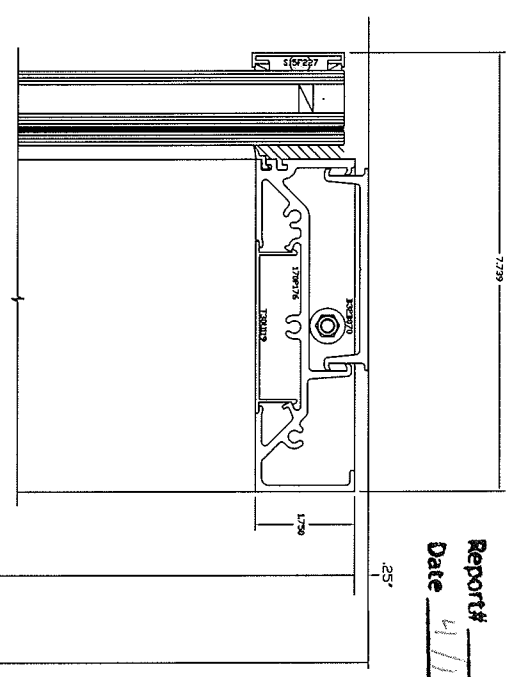
5. Reason for non-testing of sample unit: \_\_\_\_\_

[Note: If the sample submitted can not be tested due to damage prior to testing, a new sample and new form shall be submitted to the testing laboratory. Both forms shall be submitted to the IA when the testing is completed.]

**Architectural Testing**

Test sample complies with these details.  
Deviations are noted.

Report# 99724  
Date 4/17/10 Tech rpm



Prad Energy Corporation  
2000 South Street, Suite 200  
Princeton, NJ 08540-5108  
Tel: 609-682-6889  
Fax: 609-682-6889

PRD-TECH 7 SG I.G.



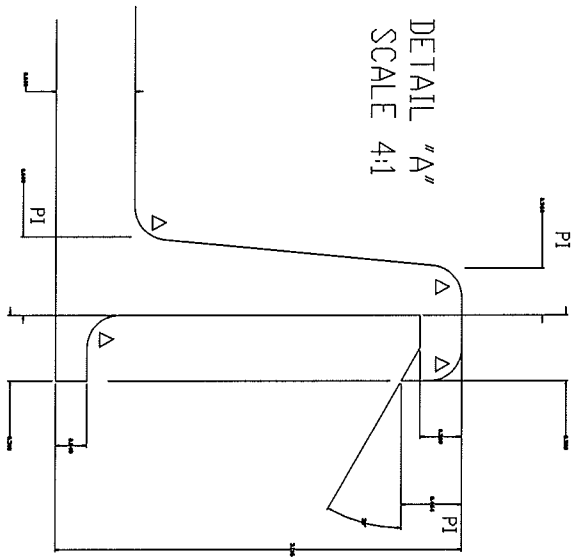




# Architectural Testing

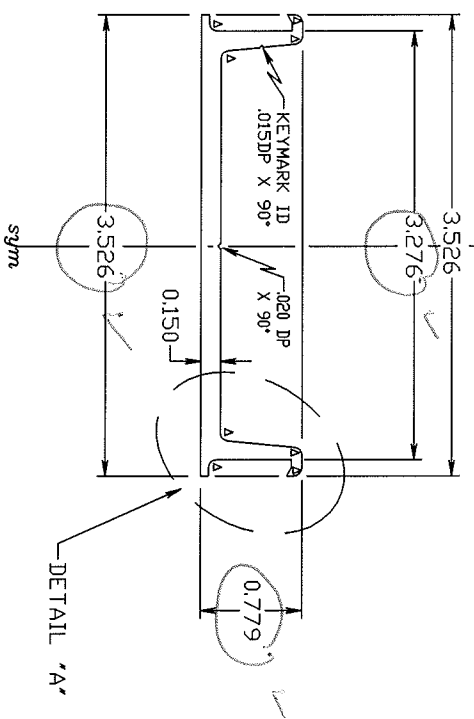
Test sample complies with these details.  
Deviations are noted.

Report# 99724  
Date 4/17/10 Tech RRM



STANDARD COMMERCIAL TOLERANCES FOR EXTRUDED PRODUCTS APPLY UNLESS SPECIFIED OTHERWISE

ACTUAL SIZE  
ND EXPOSED SURFACES



Estimated For Reference Only	Ix =	Iy =	Factor	Mill	Ano.	Drnr.	Drch.
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Type Of Finish

Sym.	Revisions	Date
	PRINT CORRECTION	

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



Unspecified Wall Thickness: AS NOTED	Break All Corners .015 Radius or as Noted
Customer: CRAWFORD TRACEY CORP.	Customer's Part Number: B32B070
Job Name: WATERMAN	Scale: 1:1
Part Title:	Date: 06-09-01
Alloy: 6105	Est. Area: 0.682 In <sup>2</sup>
Temper: T-5	Est. Wt./Ft.: 0.818 Lbs
Cavity Size:	Est. Perimeter: 10.183 In
	Circle Size: 3-4 In
	Exterior Perimeter: 10.183 In
	Checked:

S-31647  
Die Number





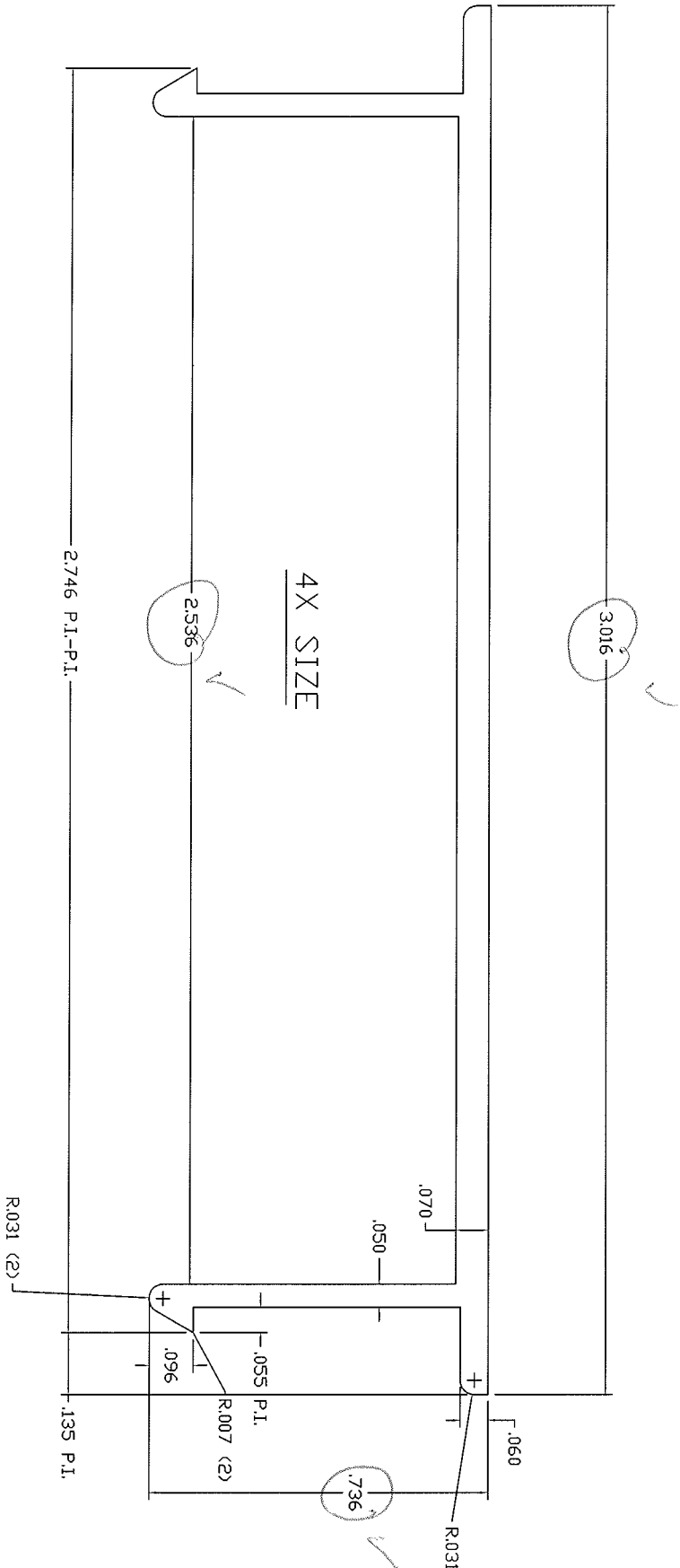
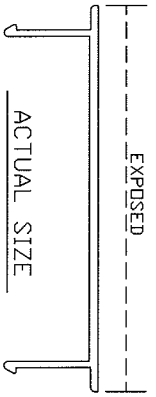




**Architectural Testing**

Test sample complies with these details.  
Deviations are noted.

Report# 99724  
Date 4/17/10 Tech RPW



**GENERAL NOTES**

CUSTOMER PART NO: T30U119  
TYPICAL WALL: VARIES  
BREAK UNSPECIFIED CORNERS: .015  
ALLOY: 6063-T6  
FINISH: PAINT/ANODIZE

**MATING PARTS:**

**LEGEND**

- \* = .007 R.
- o = .031 R.
- x = .062 R.
- x = .125 R.
- ⊗ = .250 R.

**PROPERTIES**

Area = .2780 in<sup>2</sup>  
Perimeter = 8.8756



CRAWFORD TRACEY CORPORATION  
ARCHITECTURAL GLAZING SYSTEMS  
3301 S.W.13th DRIVE  
DEERFIELD BEACH, FL 33442-8108  
PHONE: (954) 698-6888  
FAX: (954) 698-6889

**PAGE**

9 OF 10

**DATE**

11/09/98





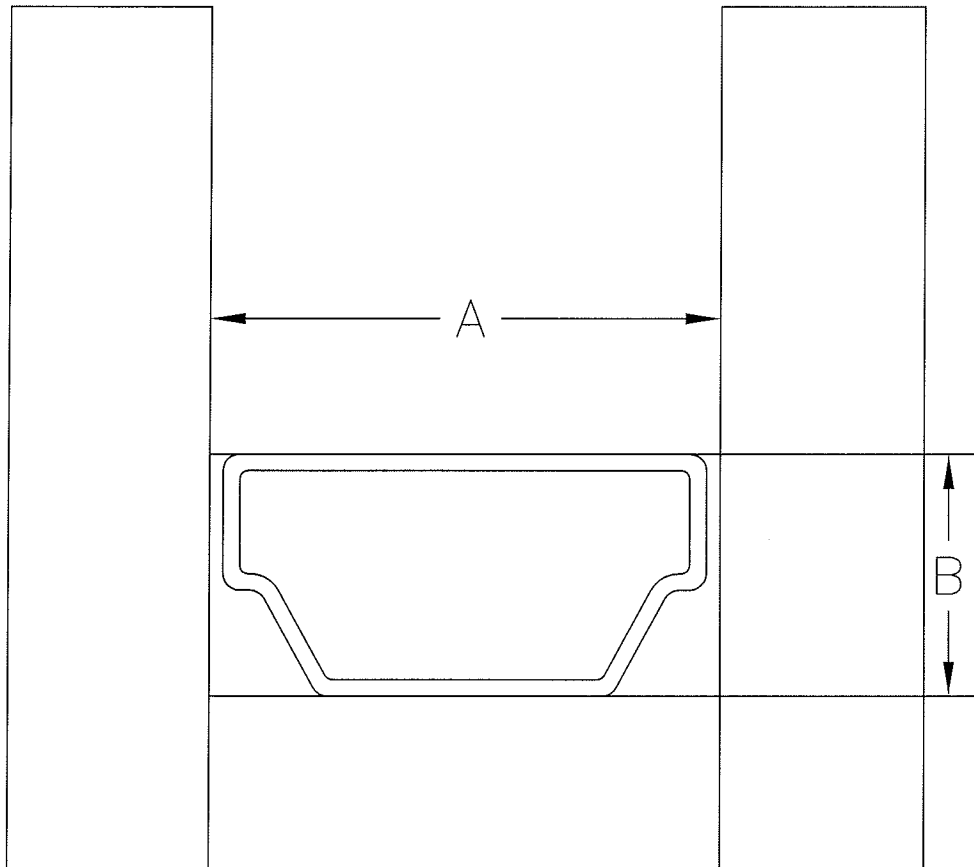


Architectural Testing

Test sample complies with these details.  
Deviations are noted.

Report: 99724  
Date: 9/17/10 Tech: RFM

# Aluminum Spacer



Offset: None  
Primary Sealant: Butyl Rubber  
Secondary Sealant: Silicone  
Material: Aluminum  
Width (A): 0.500  
Height (B): 0.315  
Wall Thickness: 0.016