TEST REPORT

REPORT NUMBER: 3179893TOR-211C GPVCCM
ISSUE DATE: April 11, 2010

EVALUATION CENTER
Intertek
6225 Kenway Drive
Mississauga, Ontario L5T 2L3

RENDERED TO

Artistic Skylight Domes Ltd.
2 Guided Court
Etobicoke, ON M9V 4K6

Attention: Nenzio Ferrazzo

PRODUCT EVALUATED: 48"×48" G-PVCCM Fixed Glass Skylight
EVALUATION PROPERTY: Physical Tests

Report of Testing for Artistic Skylights Domes Ltd. on a G-PVCCM 48"×48" curb-mounted fixed glass skylight for compliance with the applicable requirements of the following criteria: CAN/CGSB-63.14-M89 *"Plastic Skylights"*.

1 Table of Contents

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2 Introduction

Intertek has conducted performance testing for Artistic Skylight Domes Ltd. on a 48"×48" G-PVCCM curb-mounted fixed glass skylight for the Intertek Certification Program. The skylight was submitted to the Intertek laboratory in Mississauga, Ontario on November 9, 2009. Testing was conducted in accordance with the standard methods of CAN/CGSB-63.14-M89 *"Plastic Skylights"*. This evaluation began November 10, 2009 and was completed January 25, 2010.

3 Test Specimen

3.1 SPECIMEN AND ASSEMBLY DESCRIPTION

Model:
- G-PVCCM skylight

Classification:
- Class C, Type 2, formed

Type:
- Curb-mounted, aluminum capped, plastic frame fixed glass skylight

Manufacturer:
- Artistic Skylight Domes Ltd., 2 Guided Court, Etobicoke ON M9V 4K6

Condition:
- New and undamaged

Overall Frame Size:

Width	Height
1346 mm (53")	1346 mm (53")

Frame:
- Extruded vinyl main frame members (Extrusion Profiles Die No. V-413) with mitred and welded corners.
- Aluminum Cap- Extruded aluminum cap members (Spectra Aluminum Products Die No. SS-1880) having mitred corners fastened with one #6×1-1/4" pan head screw and a chevron corner key. The corners were liberally sealed with silicone on the backside.

Frame (cont'd):

- Installation: The unit was installed onto a 2x6 wood support frame with 1/2" plywood sheathing secured to one face, simulating a flat roof surface, the frame measuring 2438 mm (96") square overall. The skylight was installed over a centrally located opening, its perimeter lined with 2x6 wood members on the interior, and 2x6 wood members on the exterior forming a curb on the surface of the "roof".

Curb Opening	Width	Height
	1226 mm (48-1/4")	1226 mm (48-1/4")

The order of installation was as follows:

- The exterior of the plywood was faced with self-adhering peel-and-stick waterproofing membrane, the membrane continuing up the sides of the curb members and across the exterior face, terminating at the edge of the curb opening. Joints in the membrane were lapped over each other, the membrane being applied using a torch.
- Sections of angle-shaped brake formed 0.46 mm (0.018") thick aluminum flashing were installed along the curb, the 111 mm (4-3/8") leg of the flashing partially covering the side of the curb while the 16 mm (5/8") return partially covered the exterior face of the curb. Along the head and sill, one piece of full length flashing was used, along each jamb, two sections were used per jamb, the sections lapped over one another by 13 mm (1/2"). The flashing was retained by 1-5/8" long roofing nails
- The exterior face of the curb was fitted with an adhesive-backed closed cell foam tape gasket measuring 19 mm wide by 9.5 mm thick (3/4"×3/8"), its corners butted together. This gasket was applied to the exterior face of the curb such that it covered the joint formed between the flashing edge and the underlying membrane.
- The skylight frame was installed onto the curb, the foam gasket sandwiched between the exterior face of the curb and the backside of the skylight frame. The skylight frame was secured to the curb using #10×1-1/2" hex head self-drilling tek screws (5 per member) complete with a composite metal flat washer with a rubber gasket bonded to the underside of it.

Note: *For air tightness testing only, the inside perimeter of the skylight support frame opening was sealed with red air barrier tape to the inside perimeter of the PVC skylight frame such that the 2x6 curb-to-PVC skylight frame joint was sealed as well as the joint between the 2x6 curb, the plywood sheathing, and 2x6 wood support members lining the opening. The tape was removed for water tightness testing.*

Drainage:

- 4.8 mm (3/16") holes drained/vented the sill and one jamb to the frame cavity, two per member. The holes along the sill were 92 mm (3-5/8") on centre from the adjacent corresponding jamb surface. The holes along the jamb were 118 mm (4-5/8") on centre from the adjacent corresponding sill and head surfaces.
- The original 4.8 mm (3/16") holes draining/venting the frame cavity to the exterior were sealed with silicone.
- The frame cavity was drained/vented to the exterior via frame corners (above the curb-mount channel) which were ground off at 45º, opening up the cavity to the exterior.

Glazing:

- Factory sealed glazing unit having an exterior sheet of nominally thick 4 mm glass, an interior sheet of laminated 3mm/3mm and a metal spacer with a 9.8 mm (3/8") air gap. The glass was inscribed with the following: "OFG Tempered, ANSI Z97.1 2004, 16 CFR 1201 II, SGCC 2482 5/32 UA ". Overall IG thickness was 19.8 mm (25/32").

Glazing Method:

- Laid in glazed on the interior on a bed of silicone measuring nominally 13 mm (1/2") wide applied on a co-extruded flexible vinyl glazing gasket (Vinyl Profiles Part No. V-76), and retained with the extruded aluminum capping on the exterior, double-sided adhesive backed closed cell foam tape measuring 6.4 mm wide by 3.2 mm thick (1/4"×1/8") being sandwiched between the exterior of the glazing unit and the back side of the aluminum capping. The corners of the sealed unit were also sealed to the back-side of the capping with silicone. The aluminum cap was fastened to the skylight frame using #8×3/4" self-drilling tek screws (5 per side) installed through the side of the capping. Neoprene shims, (3 per side) secured by a dab of caulking, were fitted between the edge of the sealed unit and the down-turned leg of the capping. The shims measured 38 mm long by 25.4 mm wide by 4.8 mm thick (1-1/2"×1"×3/16").

Drawings:

- *Plan and Cross-Section Drawing:*
  Artistic Skylight Domes drawing G-PVCCM, undated

- *Component Drawings:*
  Vinyl Profiles Ltd. Drawing No. V-413, titled “Curb Mount Frame”, dated March 24, 2009
  Spectra Aluminum Products Die No. SS-1880, titled “Retaining Frame”, dated Nov/30/2000

Drawings are enclosed with this report in Appendix A.

4 Testing and Evaluation Methods

4.1. AIR INFILTRATION TEST (par. 7.2.3)

The Air Infiltration test was performed in accordance with ASTM E283-04, *"Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen"* and evaluated with the requirements outlined in par. 6.6.1.

The air infiltration test was performed using a test pressure of 75 Pa (1.57 psf). The maximum air infiltration was calculated and compared to the allowable air infiltration.

4.2. WATER RESISTANCE TEST (par. 7.2.4)

The Water Resistance test was conducted and evaluated in accordance with ASTM E331-00, "*Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference*" and evaluated with the requirements outlined in par. 6.6.2. The Water Resistance test was performed using no air pressure differential across the specimen.

The Water Resistance test was performed with the skylight installed into a make-shift roof opening as installed by the client, the installation details contained herein. For the water penetration test, the roof was placed horizontal at the specified pressure differential and a water spray rate of at least 204 L/m² per hour (5.0 U.S. gal/ft² per hour). The test duration was 15 minutes.

4.3. UNIFORM STRUCTURAL LOAD TEST (par. 7.2.5)

The Uniform Structural Load test was conducted in accordance with ASTM E330-02, "*Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference*," Procedure A and evaluated with the requirements outlined in par. 6.6.3.

A load equal to one-half the anticipated allowable load was applied and held for less than one minute. The deflection readings were then zeroed. Deflection measurements were taken at the mid-span and ends of a jamb. An anticipated allowable load of 2000 Pa (41.8 psf) was then applied and held for not less than 10 seconds. The load was then released. Permanent deflection readings were taken after a recovery period of not less than one minute nor more than five minutes at zero load. The Uniform Structural Load test was performed in both the positive and negative directions. The skylight was evaluated for failure or permanent deformation of any part of the skylight that would cause any operational malfunction.

4.4. SNOW LOAD (par. 7.2.6)

Since the IG unit of the skylight contains a sealed air space, the Uniform Structural Load test (par. 7.2.5) at 2000 Pa (41.8 psf) positive pressure fulfills the requirements of the snow load test.

5 Testing and Evaluation Results

5.1. Air Infiltration Test (par. 7.2.3)

G-PVCCM 48×48	
Net Infiltration:	1.02 m³/h (0.6 cfm)
Skylight Crack Length	4.88 m (16.00 ft)
Infiltration rate:	0.21 (m³/h)/m (0.038 cfm/ft)

Maximum allowable air infiltration rate:	2.79 (m³/h)/m (0.5 cfm/ft)

The 48"×48" G-PVCCM Fixed Skylight **MET** the performance levels specified in CAN/CGSB-63.14-M89 for Air Infiltration.

5.2. Water Resistance Test (par. 7.2.4)

G-PVCCM 48×48	
Pressure Differential	0 Pa (0 psf)
Skylight Inclination Angle	Horizontal (0 deg)
Results:	No water leakage observed and no water retained within the frame member.

The 48"×48" G-PVCCM Fixed Skylight **MET** the performance levels specified in CAN/CGSB-63.14-M89 for Water Resistance.

5.3. Uniform Structural Load Test (par. 7.2.5)

Permanent Deflection Test at Structural Pressure		
Test Pressure	***Positive Load***	***Negative Load***
	+2160 Pa (+45 psf)*	-2160 Pa (-45 psf)*
**Note*	*As testing was carried out concurrently to more than one standard, uniform load testing was carried out at slightly higher pressures that the required test pressure of ±2000 Pa (±41.8 psf).*	
Post-test Details	After the test loads were released, the skylight was inspected and there was found to be no failure or permanent deformation of any part of the skylight that would cause any operational malfunction.	

The 48"×48" G-PVCCM Fixed Skylight **MET** the performance levels specified in CAN/CGSB-63.14-M89 for Uniform Structural Load.

5.4. Snow Load Test (par. 7.2.6)

The requirements of the snow load test were fulfilled using the procedure outlined in par. 7.2.5 of CAN/CGSB-63.14-M89.

6 Conclusion

The Artistic Skylight Domes Ltd. 48"×48" G-PVCCM Fixed Skylight described and tested herein met the air infiltration, water penetration, uniform structural load and snow load performance requirements of CAN/CGSB-63.14-M89, "*Plastic Skylights*".

INTERTEK

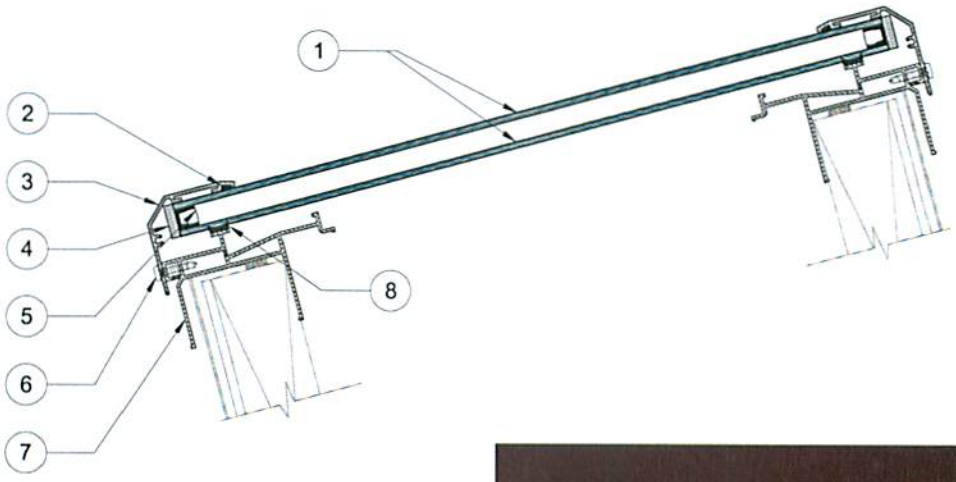
Tested by Mustafa Swalah and Claudio Sacilotto

Reported by: _____
David Wren
Physical Testing Services

Reviewed by: _____
Claudio Sacilotto
Physical Testing Services

Appendix A – Parts List / Drawings

(Parts List / Drawings – 3 pages)



MODEL G–PVCCM (CURBMOUNT FIXED – GLASS GLAZING)

	DETAIL
UNIT 1: LOW–e ON THIRD SURFACE	1 – CLEAR TEMPERED
	2 – CLEAR TEMPERED
UNIT 2: LOW–e ON THIRD SURFACE	1 – BRONZE TEMPERED
	2 – CLEAR TEMPERED
UNIT 3: LOW–e ON THIRD SURFACE with ARGON GAS FILL	1 – CLEAR TEMPERED
	2 – CLEAR TEMPERED
UNIT 4: LOW–e ON THIRD SURFACE with ARGON GAS FILL	1 – BRONZE TEMPERED
	2 – CLEAR TEMPERED
UNIT 5: LOW–e ON SECOND SURFACE	1 – CLEAR TEMPERED
	2 – CLEAR LAMINATED (0.030)
UNIT 6: LOW–e ON SECOND SURFACE	1 – BRONZE TEMPERED
	2 – CLEAR LAMINATED (0.030)
UNIT 7: LOW–e ON SECOND SURFACE with ARGON GAS FILL	1 – CLEAR TEMPERED
	2 – CLEAR LAMINATED (0.030)
UNIT 8: LOW–e ON SECOND SURFACE with ARGON GAS FILL	1 – BRONZE TEMPERED
	2 – CLEAR LAMINATED (0.030)

PARTS LIST

MODEL G–PVCCM (CURBMOUNT FIXED – GLASS GLAZING)

PARTICULAR	MANUFACTURER
1. GLASS GLAZING	GUARDIAN INDUSTRIES CORP., U.S.A.
2. ⅛" x ¼" DOUBLE FACE VINYL FOAM GLAZING TAPE	GASKA TAPE INC.
3. EXTRUDED ALUMINUM RETAINING FRAME (6063–T5 ALLOY)	SPECTRA DIE # SS–1880 & AFP DIE # 228
4. NEOPRENE SETTING BLOCK (¼" X 1" 1½") BACK ADHERED	COMBI–FAB PRODUCTS
5. ALUMINUM SPACER WITH POLYSULFIDE SEALANT	TRIPLE SEAL LTD.
6. #8 x 18 x ¾" ASSEMBLY SCREW	ROBERTSON, CANADA
7. EXTRUDED RIGID TERMAL PVC CURB FRAME	VINYL PROFILES LTD., DIE # V-413
8. CO–EXTRUDED RUBBER DRAFT SEAL	EXTRUSION PROFILES INC.

Artistic
SKYLIGHT DOMES LTD

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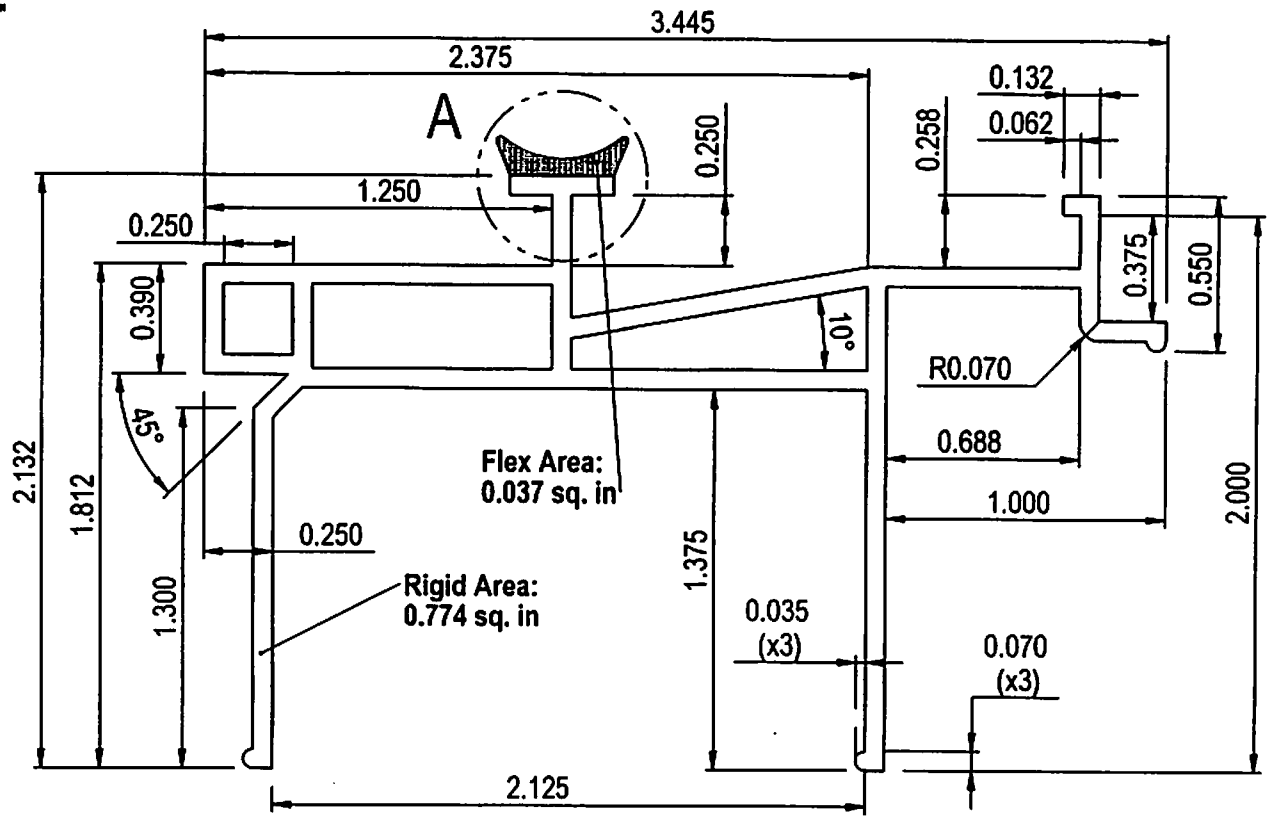
Etobicoke, Ontario, Canada M9V 4K6
E-mail: artistic@istar.ca
Web: www.artisticskylight.com

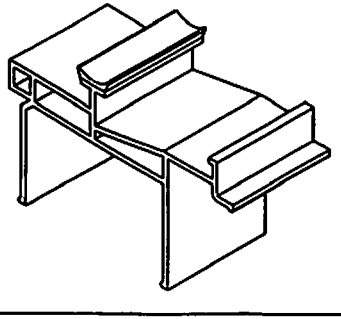
SKYLIGHT MODEL:

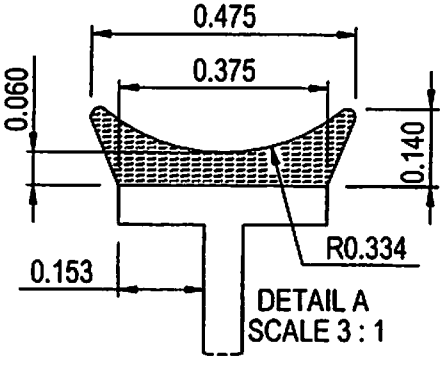
G-PVCCM

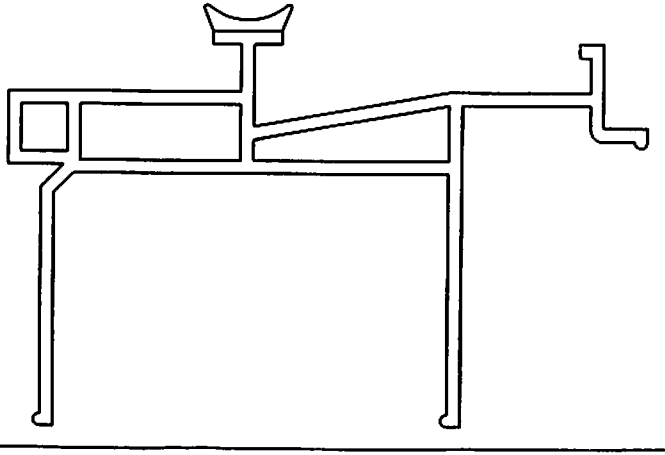
Vinyl Profiles Ltd.	Customer: Artistic		Date: March 24, 2009	Die #: V-413
CUSTOM EXTRUSION	Part Name: Curb Mount Frame		Scale: 1.5:1	Rack #: ---
166 ROMINA DR. VAUGHAN ONT. L4K 4Z7	Drawing #: V-413	Part#: 328C	Drawn By: S. Q	Area : 0.811 sq. in
Tel: 1-905-669-0336 1-905-669-0337 Fax: 1-905-669-0380	Material: Dual PVC	Color: WHT 143 / Flex-65	Approved By:	Unit: Inch

Wall Thinkness: 0.070"
Typ. Radii: 0.015"









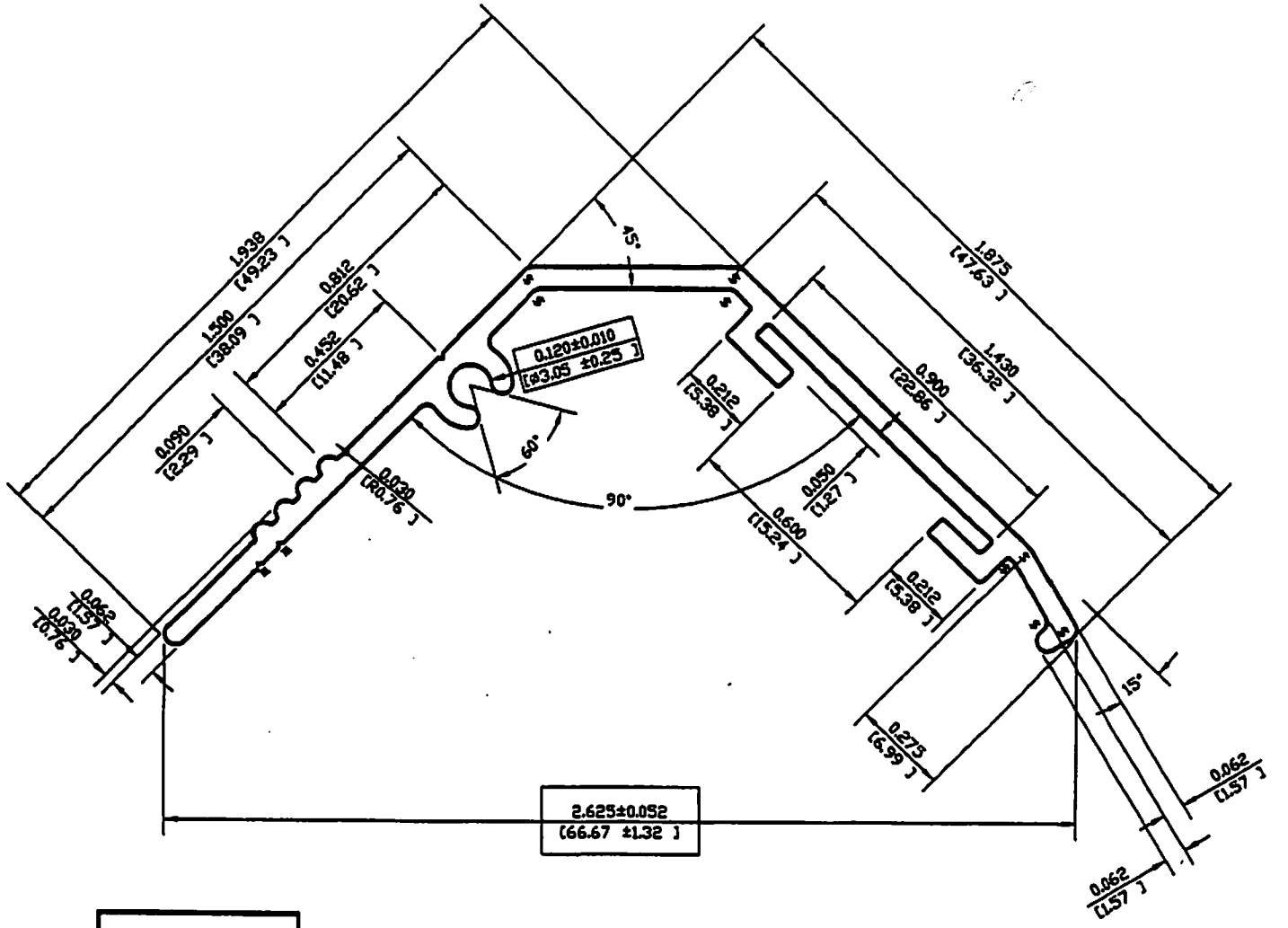
SCALE: 1:1

DESCRIPTION: RETAINING FRAME | PROPOSAL#: SP-12291 | DIE NO: SS-1880

CUSTOMER #: 01187233 | CUSTOMER: ARTISTIC SKYLIGHTS

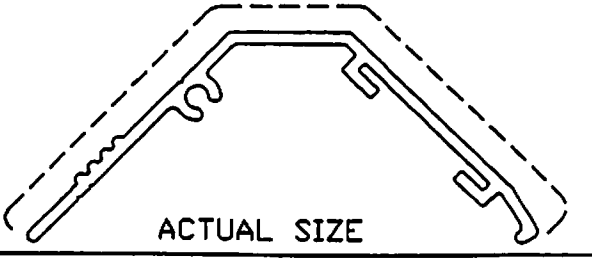
DATE	LET.	REVISION	BY:

SPECTRA ALUMINUM PRODUCTS INC
UNCONTROLLED
Date: FEB 20 2001



CAVITY I.D.

EXPOSED SURFACES



ACTUAL SIZE

NOTE: WALL THICKNESS IS 0.062" [1.57mm] UNLESS OTHERWISE SHOWN
NOTE: BREAK ALL CORNERS AT 0.010" [0.25mm] UNLESS OTHERWISE SHOWN
NOTE: $ INDICATES A 0.031" [0.79mm] RADIUS

X.XXX = CRITICAL DIM.
* = 0.010 [0.25] X 90° (SPECTRA ALUMINUM ID MARK)

NOTE: STANDARD ALUMINUM ASSOCIATION TOLERANCES APPLY UNLESS OTHERWISE SPECIFIED.

PRICING: WEIGHT ▩	PIECE: ☐	ALLOY: CHECK P.O.	TEMPER: T5		
CSS NO.: 1	CONT'R: 6"	PKT.: 3/4"	EXT. RATIO 50.66		
BACKER NO.: BA-1632-1		DIE SIZE: 8" x 1"			
BOLSTER NO.: BO-28		BACKER SIZE: 8" x 3"	EST. AREA: 0.279 sq.in 180.00 sq.mm	INS. PER: In mm	
GUAGE:	NITROGEN: ☐	CAV.: 2	OUT. PER: 8.811 in 223.80 mm	FACTOR: 26.78	
DWN. BY: S.B.	SCALE: 2:1	DATE: NOV/30/2000	EST. WT.: 0.329 lbs/ft. 0.489 kg/m	C.C.D.: 2.625 in 66.66 mm	

SPECTRA ALUMINUM PRODUCTS INC