TEST REPORT

REPORT NUMBER: 3179893TOR-213C G-PVCSR
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-PVCSR Fixed Glass Skylight
EVALUATION PROPERTY: Physical Tests

Report of Testing for Artistic Skylights Domes Ltd. on a G-PVCSR 48"×48" deck-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-PVCSR deck-mounted fixed glass skylight for the Intertek Certification Program. The skylight was submitted to the Intertek laboratory in Mississauga, Ontario on August 17, 2009. Testing was conducted in accordance with the standard methods of CAN/CGSB-63.14-M89 *"Plastic Skylights"*. This evaluation began August 31, 2009 and was completed October 2, 2009.

3 Test Specimen

3.1. SPECIMEN AND ASSEMBLY DESCRIPTION

Model:
- G-PVCSR Skylight

Classification:
- Class C, Type 2, formed

Type:
- Deck-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:
-

Overall size (including integral nailing fin)	
Width	Height
1457 mm (57-3/8")	1457 mm (57-3/8")

Frame:
- Extruded vinyl main frame members (Extrusion Profiles Die No. 329C) with mitred and welded corners. The frame was complete with an integral nailing fin.
- 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.
- Aluminum Head Flashing- Brake-formed 'Z'-shaped 0.46 mm (0.018") thick aluminum flashing having a 337 mm (13-1/4") long leg (fastened to the roof deck), a 60 mm (2-3/8") outward return, and a 45 mm (1-3/4") long drip edge leg. The top edge of the flashing also had a 13 mm (1/2") wide inward return. The flashing measured 1803 mm (71") long overall.
- Installation: The unit was installed onto a 2x6 wood support frame with 1/2" plywood sheathing secured to one face, simulating an inclined roof surface, the frame measuring 2438 mm (96") square. The skylight was installed over a centrally located opening, its perimeter lined with 2x6 wood members, and measured 1229 mm (48-3/8") wide by 1226 mm (48-1/4") high.

Frame (cont'd):

- The order of installation was as follows:
  The exterior of the plywood, from the bottom edge of the support frame up to the bottom edge of the opening and extending up the sides of the opening by 76 mm (3"), was faced with self-adhering peel-and-stick waterproofing membrane. A nominally 102 mm (4") wide bed of silicone was applied to the exposed membrane along the bottom edge of the opening, this silicone bed continued up each side of the opening for approximately 711 mm (28"), applied to the membrane surface near the bottom of the opening continuing along the exposed plywood above the membrane (the bed of silicone varying from 63 mm (2-1/2") to 102 mm (4") wide along the sides of the opening).
- The skylight was then placed over the opening and fastened to the plywood along the head and jambs with 1-1/4" long roofing nails installed in the pre-punched holes along the nailing fin, the holes on 122 mm (4-13/16") centres, eight nails along the head and twenty per jamb. There were no fasteners used along the exposed sill nailing fin. Strips of waterproofing membrane measuring approximately 457 mm (18") wide were then applied along each side and along the top of the unit, covering the exposed nailing fin and adjacent plywood surface. Conventional three-tab asphalt shingles were then installed over the membrane (butting up against the side of the skylight frame) along each side of the unit using 1-1/4" long roofing nails. The membrane was also applied over the nailing fin and adjacent plywood along the top of the unit, the membrane continuous to the top edge of the plywood, and lapping over the membrane along the sides of the unit.
- A brake-formed aluminum flashing was then installed over the head of the skylight using the roofing nails, two per end. The top edge of the flashing had a 13 mm (1/2") wide inward return which wrapped over the top edge of the plywood sheathing and was sealed with tape.

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 plywood sheathing-to-PVC skylight frame joint was sealed as well as the joint between the plywood sheathing and 2x6 wood support members lining the opening. The tape was removed for water tightness testing.*

Drainage:

- None (original slots along sill sealed with silicone).

Glazing:

- Factory sealed glazing unit having an exterior sheet of nominally thick 4 mm tempered glass, an interior sheet of laminated 3mm/3mm and a metal spacer with a 9.8 mm gap. The glass was inscribed with the following: "OFG Tempered, ANSI Z97.1 2004, 16 CFR 1201 II, SGCC 3023 3/16 UA ". Overall IG thickness was 19.8 mm.

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, 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, five per frame member installed through the side of the capping. Neoprene shims, secured by a dab of caulking, were fitted between the edge of the sealed unit and the down-turned leg of the capping, three along each member. 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-PVCSR, undated

- *Component Drawings:*
  Extrusion Profiles Inc. Die No. 329c, titled “Self Flashing Frame”, dated Jan 09, 2004
  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 at a 15° incline from horizontal at the specified pressure differential and a water spray rate of at least 204 L/m² per hour (5.0 US 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 the sill. 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-PVCSR 48×48	
Net Infiltration:	1.50 m³/h (0.88 cfm)
Skylight Crack Length	5.033 m (16.50 ft)
Infiltration rate:	0.30 (m³/h)/m (0.054 cfm/ft)

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

The 48"×48" G-PVCSR 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-PVCSR 48×48	
Pressure Differential	0 Pa (0 psf)
Skylight Inclination Angle	15°
Results:	No water leakage observed and no water retained within the frame member.

The 48"×48" G-PVCSR 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***
	+2000 Pa (+41.8 psf)	-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-PVCSR 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-PVCSR 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

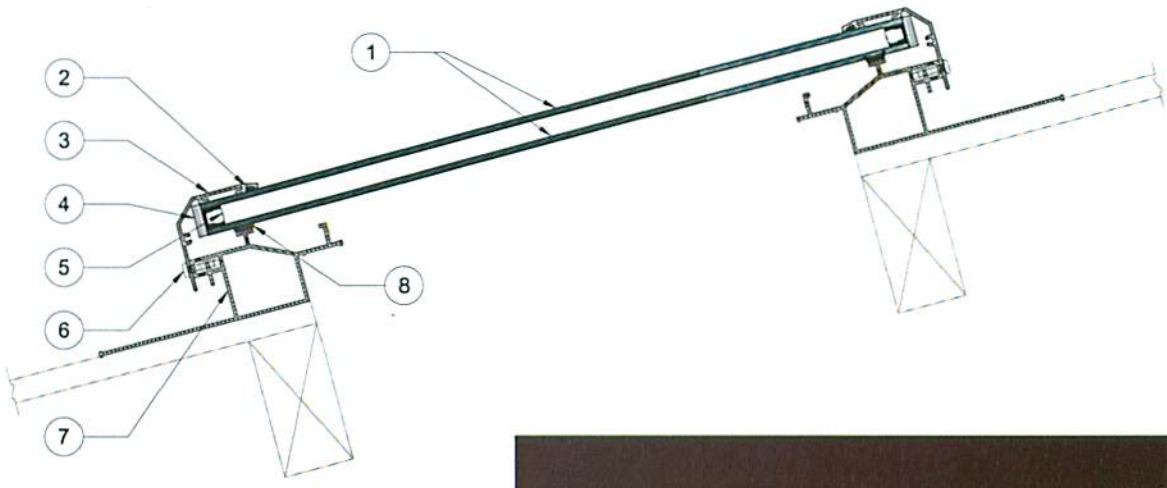
Tested by Mustafa Swalah and Claudio Sacilotto

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-PVCSR (SELF FLASHING 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-PVCR (SELF FLASHING 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"x1"x1½") BACK ADHERED	COMBI-FAB PRODUCTS
5. ALUMINUM SPACER WITH POLYSULFIDE SEALANT	TRIPLE SEAL LTD.
6. #8 – 18 X ¾" ASSEMBLY SCREW	ROBERTSON, CANADA
7. EXTRUDED RIGID THERMAL PVC SELF-FLASHING FRAME	EXTRUSION PROFILES INC., DIE # 329
8. CO-EXTRUDED RUBBER DRAFT SEAL	EXTRUSION PROFILES INC.

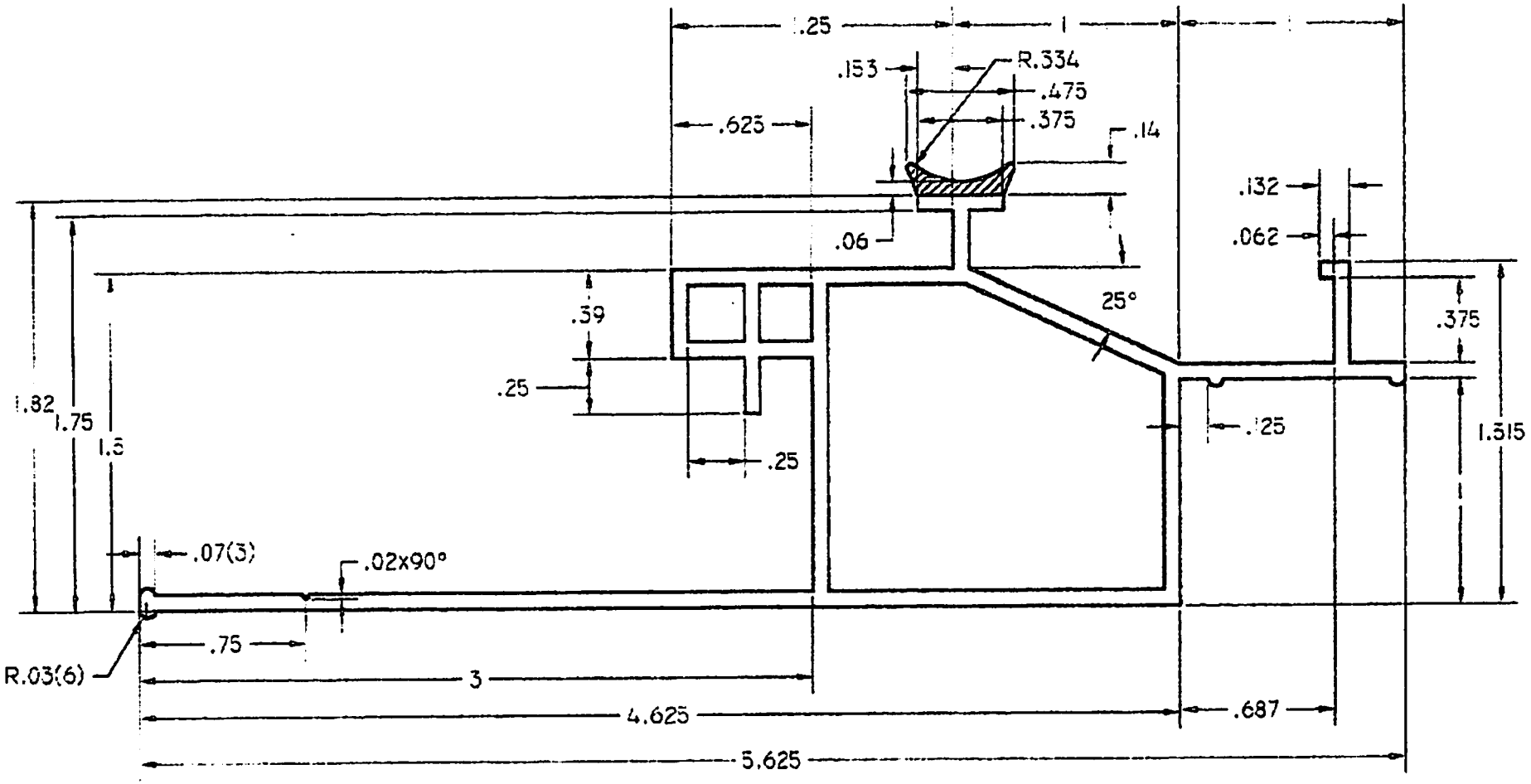
Artistic
SKYLIGHT DOMES LTD

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

SKYLIGHT MODEL:

G-PVCSR

MATERIAL	DESCRIPTION	DATE	APPROVED



EXTRUSION PROFILES INC.

9933 Markham Rd.#17
Markham,ON.L3P 3J3
Tel. 905-471-3455
Fax.: 905-471-0104

TITLE: *SELF FLASHING FRAME*

SIZE	DWG BY	DWG DATE	REV
	Mimmy	JAN.09,2004	

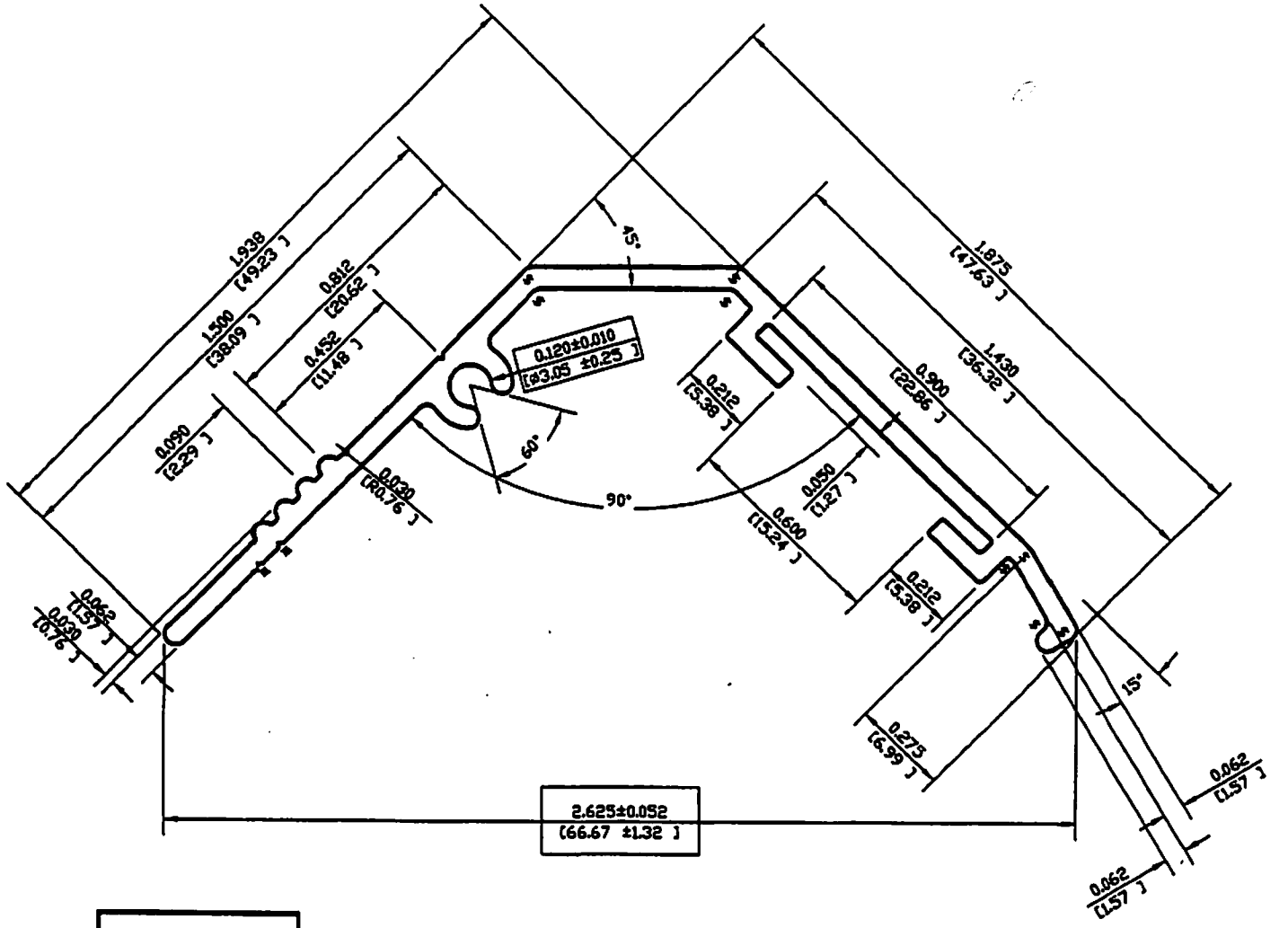
SCALE	DWG NO	SHEET
	DIE#:329C	

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

CUSTOMER #: 01187233 | CUSTOMER: ARTISTIC SKYLIGHTS

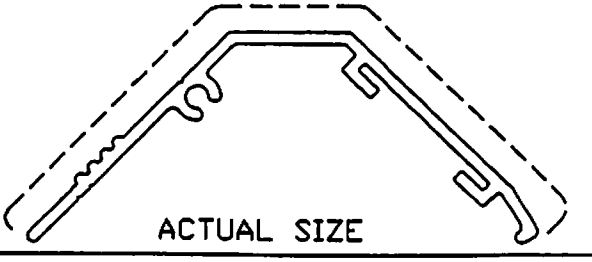
DATE	LET.	REVISION	BY:

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