TEST REPORT

REPORT NUMBER: 3179893TOR-214B GV-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" GV-PVCSR Venting Glass Skylight
EVALUATION PROPERTY: Physical Tests

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

1 Table of Contents

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

2 Introduction

Intertek has conducted performance testing for Artistic Skylight Domes Ltd. on a 48"×48" GV-PVCSR deck-mounted venting 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 21, 2009 and was completed October 5, 2009.

3 Test Specimen

3.1. SPECIMEN AND ASSEMBLY DESCRIPTION

Model:
- GV-PVCSR Skylight

Classification:
- Class C, Type 2, formed

Type:
- Deck-mounted, aluminum capped, venting glass skylight having one top hinged projected out sash.

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

Condition:
- New and undamaged

Overall Size:
-

Overall (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 Head Flashing- Brake-formed 'Z'-shaped 0.46 mm (0.018") thick aluminum flashing having a 264 mm (10-1/2") long to 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 flashing measured 1803 mm (71") long overall across the larger leg, the ends of the large leg cut at and angle, and the ends of the return folded at an angle so that the drip-edge leg measured 1378 mm (54-1/4") wide 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 overall. The skylight was installed over a centrally located opening, its perimeter lined with 2x6 wood members, and measured 1222 mm (48-1/8") wide by 1222 mm (48-1/8") 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 was faced with self-adhering peel-and-stick waterproofing membrane. A 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 400 mm (16") up the up jambs.

- 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 head and jamb nailing fins, the holes on 122 mm (4-13/16") centres. 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.

Number of Installation Fasteners (Roofing Nails)	
Head Nailing Fin	Jamb Nailing Fin
12	11

- A brake-formed aluminum flashing was then installed over the head of the skylight using the roofing nails, two per end. The waterproofing membrane was applied over the top edge of the flashing, existing membrane above the flashing, and over the shingles either side of the flashing. This section of membrane was the full width of the support frame, overlapping the flashing by 230 mm (9"), the top of the adjacent shingles by 204 mm (8"), and continued up to the top edge of the plywood sheathing.

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.*

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Sash:

- Members: Extruded aluminum members having mitred corners supported by two metal chevron keys per corner fitted to tracks on the exterior face, the outer key fastened to the corresponding sash member with a #8×1/2" pan head self-drilling tek screw. The corners were sealed between the glazing gasket and outer corner key with silicone on the exterior, and between the weather-strip kerf (including the kerf) and the back edge of the sash along the inside of the corner. The inside perimeter of the sash was fitted with a vinyl cap having mitred corners. An angle-shaped metal clip at the top of each stile was retained by the corresponding corner key retaining screw. These clips measured 32 mm (1-1/4") wide with a 32 mm (1-1/4") long leg covering/retaining the head of the hinge pin, and a 19 mm (3/4") long leg fastened to the face of the sash over the corner key.

- Aluminum Cap- Extruded aluminum cap members (Bon L Die No. PA-37250) having welded mitred corners

Sash Size	
Width mm (in.)	Height mm (in.)
1348 mm (53-1/16")	1348 mm (53-1/16")

Locks and Hardware:

- Hinges: The sash was operated on two 5.2 mm (13/64") thick galvanized steel knurled nails (one per stile), each measuring 130 mm (5-1/8") long overall, fitted through openings at the top of each stile and engaging an internal port running the length of the head, the nails secured in the ports with silicone applied to the knurled portion. The openings at the end of each stile measured 6.8 mm (17/64") in diameter and were located 7.9 mm (5/16") on centre down from the top end of each stile. The head on each nail measured 11 mm (7/16") in diameter, the shank of the nail being knurled for 68 mm (2-11/16"), the knurling starting 51 mm (2") below the head.

- Operator: The sash was operated by a chain type roto gear hardware module (Truth Hardware Part No. 42.65) fastened to the sill using two #10×2" pan head "'allthread" screws and to the adjacent wood 2x6 curb member with using two #8×2" flat head screws. The operator was located such that its chain was equi-distant from each jamb. The operator was sealed to the sill about the punched opening for the chain with silicone. The chain engaged a sash bracket (Truth Hardware Part# 40470) via a detachable sash pin (Truth Hardware Part# 20642). The sash bracket was fastened to the sash sill rail using two #8×1/2" pan head self-drilling tek screws.

Drainage:

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

Weather-stripping:

- The exterior face of the frame was single weather-stripped with a co-extruded rubber draft seal.
- The interior face of the sash was single weather-stripped with kerf-inserted flexible vinyl bulb gasket (Vinyl Profiles Part No. V-75) having butted corners, the corners sealed with silicone.

Glazing:

- Factory sealed glazing unit having an exterior sheet of nominally thick 5 mm tempered glass, an interior sheet of laminated 3mm/3mm and a metal spacer with a 6.8 mm (17/64") air gap. The glass was inscribed with the following: "OFG Tempered, ANSI Z97.1 2004, 16 CFR 1201 II, SGCC 3023 3/16 UA 05/26/09". Overall IG thickness was 17.5 mm (11/16").

Glazing Method:

- Laid in glazed on the interior on a bed of silicone applied to and underlying kerf-inserted rubber 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") was sandwiched between the exterior face of the sealed unit and the back side of the aluminum capping. The aluminum cap was fastened to the skylight frame using #8×3/4" self-drilling tek screws, 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. 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 V-PVCSR, undated

- *Component Drawings:*
  Extrusion Profiles Inc. Die No. 329c, titled “Self Flashing Frame”, dated Jan 09, 2004
  Spectra Aluminum Products Die No. SS-1631, titled “Sash Frame”, dated Jan/13/2000
  Vinyl Profiles Ltd. Drawing V-130, titled “Artistic Skylight Domes-Sash Thermal Cover”, undated
  BonL Canada Inc. Die No. PA-37250, untitled, dated Nov/01/1995

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 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 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)

GV-PVCSR 48×48	
Net Infiltration:	0.85 m³/h (0.5 cfm)
Skylight Crack Length	5.033 m (16.50 ft)
Infiltration rate:	0.17 m³/h/m (0.030 cfm/ft)

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

The 48"×48" GV-PVCSR Venting Skylight **MET** the performance levels specified in CAN/CGSB-63.14-M89 for Air Infiltration.

5.2. Water Resistance Test (par. 7.2.4)

GV-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" GV-PVCSR Venting 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		
Full-Load Structural Test Pressure*	***Positive Load***	***Negative Load***
	+2400 Pa (+50 psf)*	-2400 Pa (-50 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" GV-PVCSR Venting 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 GV-PVCSR venting 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

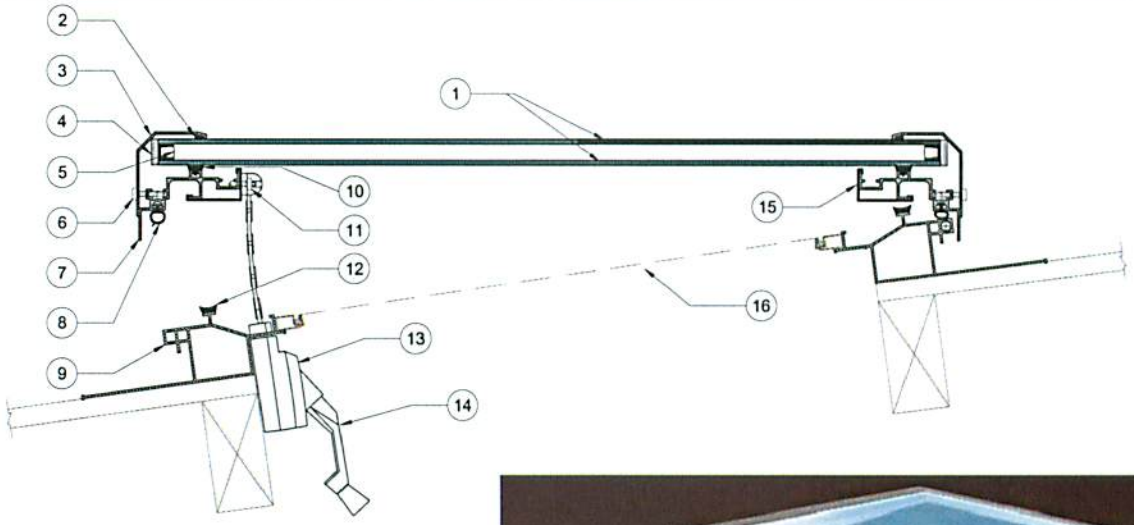
Tested by Mustafa Swalah and Claudio Sacilotto

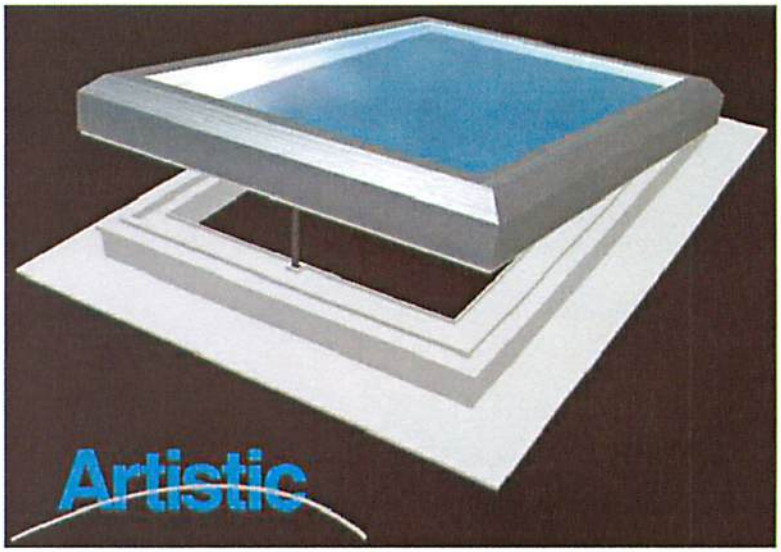
Reported by: _____
David Wren
Physical Testing Services

Reviewed by: _____
Claudio Sacilotto
Physical Testing Services

Appendix A – Parts List / Drawings

(Parts List / Drawings – 5 pages)





MODEL GV-PVCSR (SELF FLASHING VENTING – 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 GV-PVCR (SELF FLASHING VENTING – GLASS GLAZING)

PARTICULAR	MANUFACTURER
1. GLASS GLAZING	GUARDIAN INDUSTRIES CORP., U.S.A.
2. ⅛" x ¾" DOUBLE FACE VINYL FOAM GLAZING TAPE	GASKA TAPE INC.
3. EXTRUDED ALUMINUM RETAINING FRAME-MEDIUM (6063-T5 ALLOY)	BON-L , DIE # PA-37250
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 ALUMINUM SASH FRAME (6063-T5 ALLOY)	SPECTRA, DIE # SS-1631
8. BULB GASKET (FLEXIBLE PVC-UV STABLE)	VINYL PROFILES LTD., # V-75
9. EXTRUDED RIGID THERMAL PVC SELF FLASHING FRAME	EXTRUSION PROFILES INC., DIE # 328
10. SANTOPRENE CUP GASKET (UV STABLE)	VINYL PROFILES LTD., # V-76
11. #8 – 18 x ½" ASSEMBLY SCREW	ROBERTSON, CANADA
12. CO-EXTRUDED RUBBER DRAFT SEAL	EXTRUSION PROFILES INC.
13. CHAIN DRIVE OPERATING MECHANISM	TRUTH HARDWARE, U.S.A.
14. TELESCOPING POLE-HOOK / HANDLE	TRUTH HARDWARE, U.S.A.
15. EXTRUDED RIGID PVC SASH THERMAL FRAME COVER (UV STABLE)	VINYL PROFILES LTD., # V-130
16. INSECT SCREEN	PHIFER WIRE PRODUCTS, INC., USA

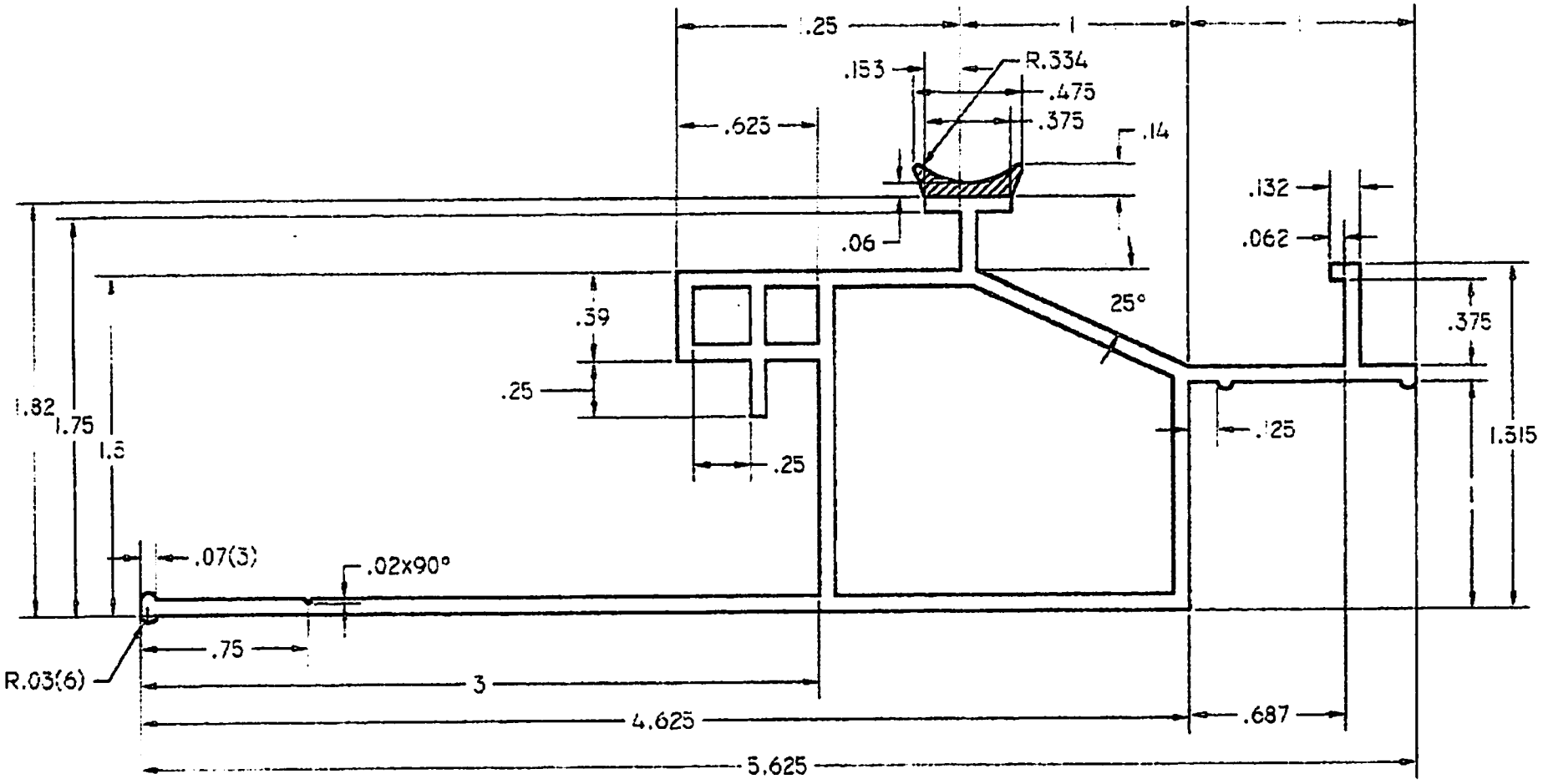
Artistic
SKYLIGHT DOMES LTD

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

SKYLIGHT MODEL:

GV-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*

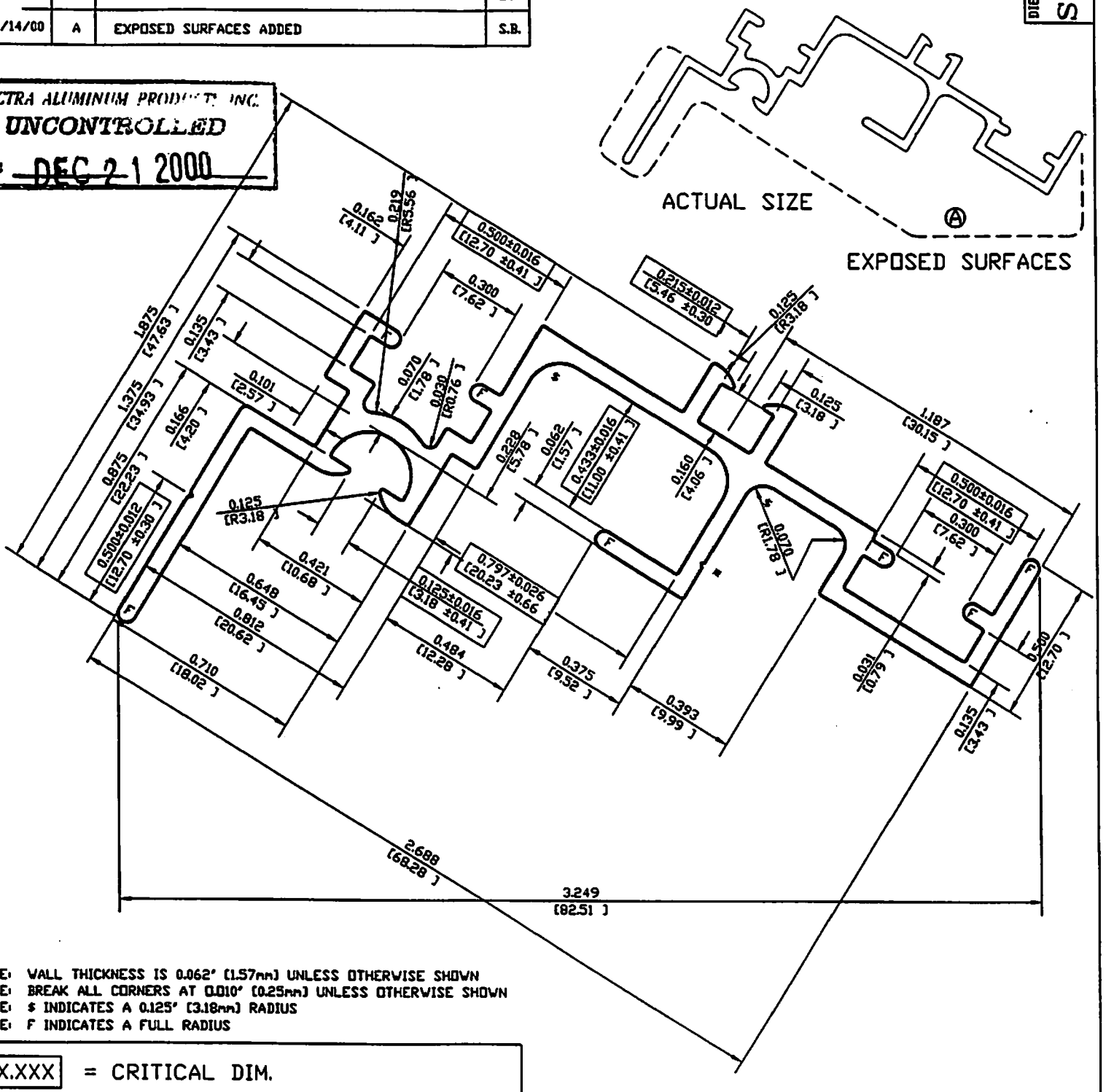
SIZE	DWG BY	DWG DATE	REV
	Mimmy	JAN.09,2004	

SCALE	DWG NO	SHEET
	DIE#:329C	

DESCRIPTION: SASH FRAME	PROPOSAL#: SP-11740	DIE NO: SS-1631
CUSTOMER #: 01187233	CUSTOMER: ARTISTIC SKYLIGHTS	

	LET.	REVISION	BY:
NOV/14/00	A	EXPOSED SURFACES ADDED	S.B.

SPECTRA ALUMINUM PRODUCTS INC.
UNCONTROLLED
Date: DEC 21 2000



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 0.125" [3.18mm] RADIUS
NOTE: F INDICATES A FULL RADIUS

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

NOTE: STANDARD ALUMINUM ASSOCIATION TOLERANCES APPLY UNLESS OTHERWISE SPECIFIED.

ING: WEIGHT ☒	PIECE: ☐	ALLOY: CHECK P.O.	TEMPER: T5	
PRESS NO.: 1	CONT'R: 6"	PKT.: 3/4"	EXT. RATIO	
BACKER NO.: BA-1631-1		DIE SIZE: 8" x 1"		
BOLSTER NO.: EO-1D		BACKER SIZE: 8" x 3"		
GUAGE:	NITROGEN: ☐	CAV.: 1		
DWN. BY: S.B.	SCALE: 2:1	DATE: JAN/13/2000		

SPECTRA
ALUMINUM PRODUCTS INC

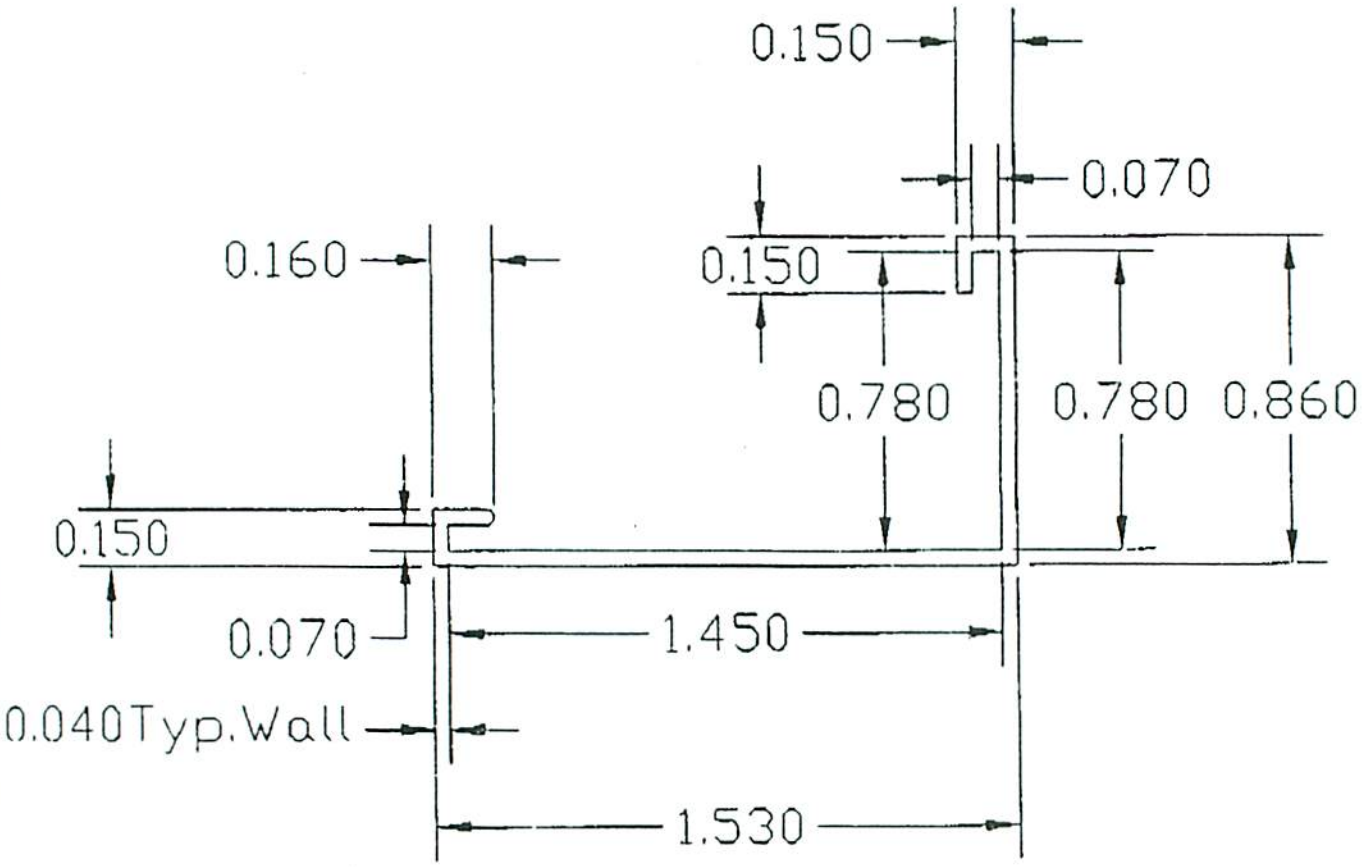
EST. AREA: 0.471 sq.in 303.87 sq.mm	OUT. PER.	In	mm
OUT. PER.: 14.280 In 362.71 mm	FACTOR:		
EST. WT.: 0.556 lbs/ft. 0.826 kg/m	C.C.D.:	In	mm

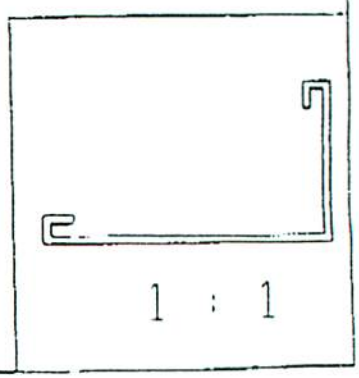
Vinyl Profiles Ltd.

120 Norfinch Drive Unit 6,
North York, Ont. M3N 1X3
Tel: 416-739-6336
Fax: 416-739-7070

Artistic Skylight Domes - Sash Thermal Cover

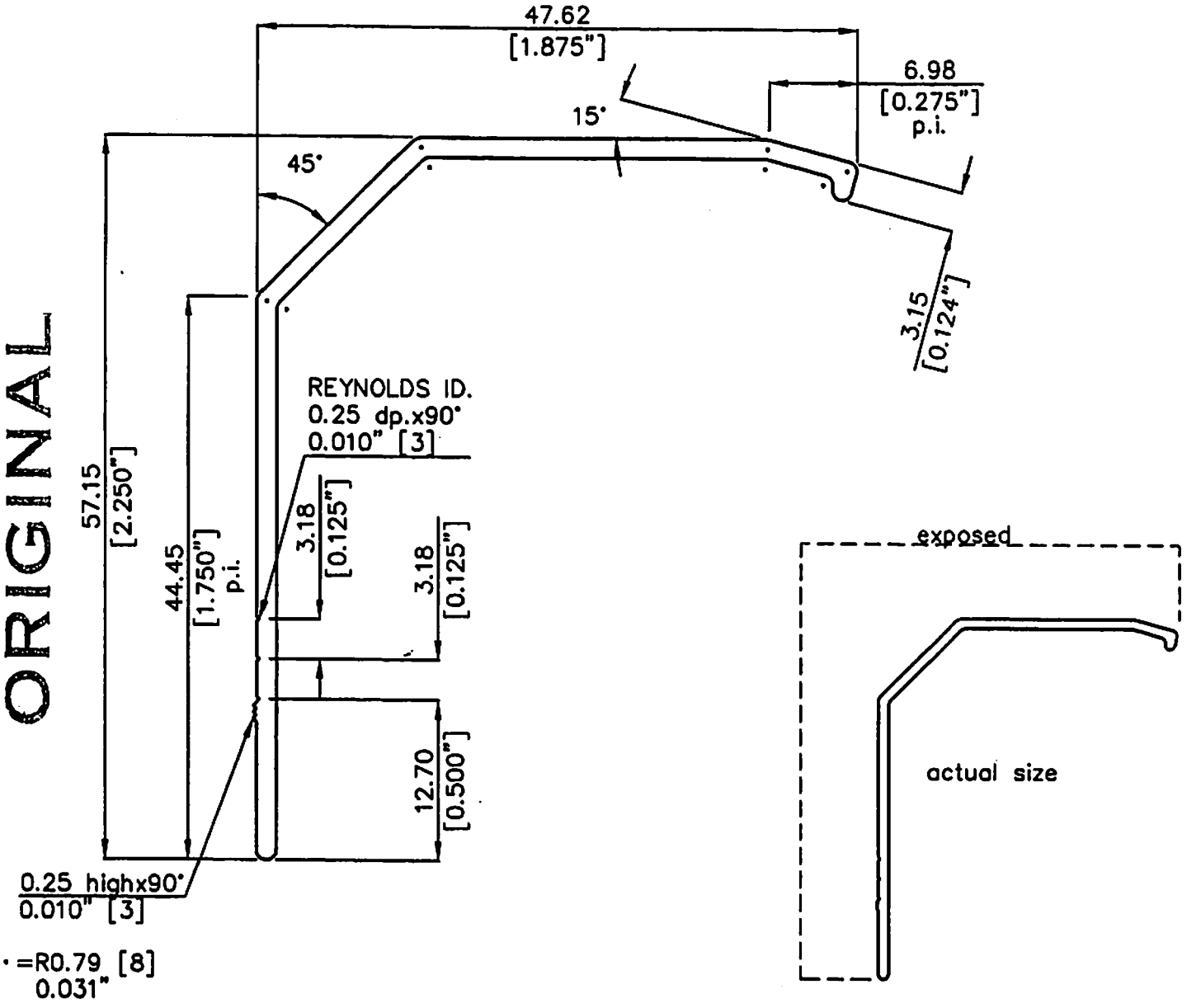
V-130





PROPOSAL NO.	CUSTOMER	DIE NO.
	ARTISTIC SKYLIGHT	PA-37250

ORIGINAL



· =R0.79 [8]
0.031"

VENDOR:		DATE ORDERED:		DATE DUE:		P.O.#:	
ITEM	ACCOUNT #	QTY	COPY NO.	DESCRIPTION			TOTAL $
1							
Rev. #	Revision		Date	Rev. #	Revision		Date

CUSTOMER PART #:			RomiShape ☐	DESCRIPTION: DOME CAP					
CONTAINER: 7"	DIE TYPE: D+B		BACKER: 37250	UNMARKED THICKNESS:		1.27	mm	0.050	inches
NO. CAVITIES: 2	RING: 9" STEP		BOLSTER: 1B-25428	UNMARKED RADII:		FULL	mm	FULL	inches
DIE RATIO: 81	DIE PLATE: 13/4		SUB-BOL: —	DRAWN: FORBIE	AREA:	154	mm^2	0.238	$inches^2$
DIE STACK: 9x4	FEEDER: PIF		SHIM: —	SCALE: 2:1	MASS:	0.425	kg/m	0.286	lbs/ft
Sharp corner tolerance: + 0.40 mm 0.016 inches				DATE: NOV/01/1995	PERIMETER:	197.9	mm	7.791	inches
Standard Aluminum Association tolerances apply unless otherwise stated				ALLOY: 6063	EXT. PER:	—	mm	—	inches
Bon L Canada Inc. AURORA, ONTARIO PICKERING, ONTARIO RICHMOND HILL, ONTARIO STE. THERESE, QUEBEC				CLASS: SOLID	FACTOR:	466	metric	27	imperial
				DISKETTE:	C.C.D.:	73	mm	2.87	inches