TEST REPORT

REPORT NUMBER: 3179893TOR-216B VPVCCM
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" V-PVCCM Venting Plastic Dome Skylight
EVALUATION PROPERTY: Physical Tests

Report of Testing for Artistic Skylights Domes Ltd. on a V-PVCCM 48"×48" curb-mounted venting plastic dome 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 V-PVCCM 48"×48" curb-mounted venting plastic dome 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" G-PVCCM curb-mounted venting glass skylight for the Intertek Certification Program. The skylight was submitted to the Intertek laboratory in Mississauga, Ontario on November 5, 2010. Testing was conducted in accordance with the standard methods of CAN/CGSB-63.14-M89 *"Plastic Skylights"*. This evaluation began November 11, 2009 and was completed December 9, 2009.

3 Test Specimen

3.1. SPECIMEN AND ASSEMBLY DESCRIPTION

Model:
- V-PVCCM Skylight

Classification:
- Class C, Type 2, formed

Type:
- Curb-mounted, aluminum capped, plastic frame venting plastic dome 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 (Vinyl Profile Ltd. Die No. V-413) with mitred and welded corners.
- 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". The curb opening measured nominally 1226 mm (48-1/4") square.

- 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.

Frame (cont'd):

- 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 installed through the short leg of the flashing into the face of the curb. The corners of the flashing were folded such that, at each end of the head, the flashing terminated in a triangular shaped drip edge extending outboard of the end of the head section of curb (in a plane parallel to the side of the curb along the head). These triangular-shaped ends measured 76 mm (3") wide by 70 mm (2-3/4") deep, the rear edge corresponding to the rear edge of the flashing. To the exterior of the triangular-shaped folded ends, the flashing was wrapped around the corner of the curb and overlapped the jamb flashing and retained by a roofing nail. At the sill, the corners of the flashing were folded so that the jamb flashing terminated in a rectangular shaped drip edge extending outboard of the end of the jamb section of curb. These rectangular ends measuring 25.4 mm (1") wide by 70 mm (2-3/4") deep, the rear edge corresponding to the rear edge of the flashing. To the exterior of the rectangular-shaped folded ends, the flashing was wrapped around the corner of the curb and overlapped the sill flashing and was retained by a roofing nail.

- 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 complete with a composite metal flat washer with a rubber gasket bonded to the underside of it.

Number of Installation Fasteners (To curb)	
Head / Sill Nailing Fin	Jamb Nailing Fin
5	5

- For test purposes, the plywood surface (roof surface) was tested for air leakage and water penetration resistance in the horizontal orientation.

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.*

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 - 1346 mm (53")
  Height - 1346 mm (53")

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:

- Frame surface to frame cavity: None (original holes along frame members sealed with silicone).
- Frame cavity to exterior: Two 4.8 mm (3/16") diameter holes per frame member, spaced approximately 305 mm (12") apart along the short frame members and 787 mm (31") apart along the long frame members.

Weather-stripping:

- The exterior face of the frame was single weather-stripped with a co-extruded flexible vinyl glazing gasket onto which adhesive-backed closed cell foam tape was applied, having butted corners. The tape measured 19 mm wide by 3.2 mm thick (3/4"×1/8").
- 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:

- Two domed layers of nominally 3.2 mm (0.125") thick acrylic plastic (Plaskolite) with a 6.4 mm (1/4") air space, the two layers separated about the perimeter with double sided adhesive backed closed cell foam tape (continuous at three corners) measuring 9.5 mm wide by 6.4 mm thick (3/8"×1/4") sandwiched between the layers The tape joint at the fourth corner was sealed with silicone.

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 9.5 mm wide by 3.2 mm thick (3/8"×1/8") being sandwiched between the exterior domed layer and the back side of the aluminum capping. The corners of the exterior domed layer were also sealed to the back-side of the capping with silicone. The aluminum cap was fastened to the skylight sash using #8×3/4" self-drilling tek screws, installed through the side of the capping.

Number of Aluminum Cap Fasteners	
Head/Sill	Jambs
6	6

Drawings:

- *Plan and Cross-Section Drawing:*
  Artistic Skylight Domes drawing V-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-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 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 stile. 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)

The inner glazing layer was breached and the Uniform Structural Load test (par. 7.2.5) was performed at 2000 Pa (41.8 psf) positive pressure, applying the pressure difference to the outer glazing layer.

5 Testing and Evaluation Results

5.1. Air Infiltration Test (par. 7.2.3)

V-PVCCM 48×48	
Net Infiltration:	0.68 m³/h (0.4 cfm)
Skylight Crack Length	4.880 m (16.00 ft)
Infiltration rate:	0.14 m³/h/m (0.025 cfm/ft)

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

The V-PVCCM skylight **MET** the performance levels specified in CAN/CGSB-63.14-M89 for Air Infiltration.

5.2. Water Resistance Test (par. 7.2.4)

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

The V-PVCCM 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***
	+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 V-PVCCM 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)

Following the application of a 2000 Pa (41.8 psf) positive wind load on the outer glazing layer, the skylight showed no visible deformation or breakage.

The 48"×48" V-PVCCM Venting Skylight **MET** the snow load requirement specified in CAN/CGSB-63.14-M89.

6 Conclusion

The Artistic Skylight Domes Ltd. 48×48 V-PVCCM 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

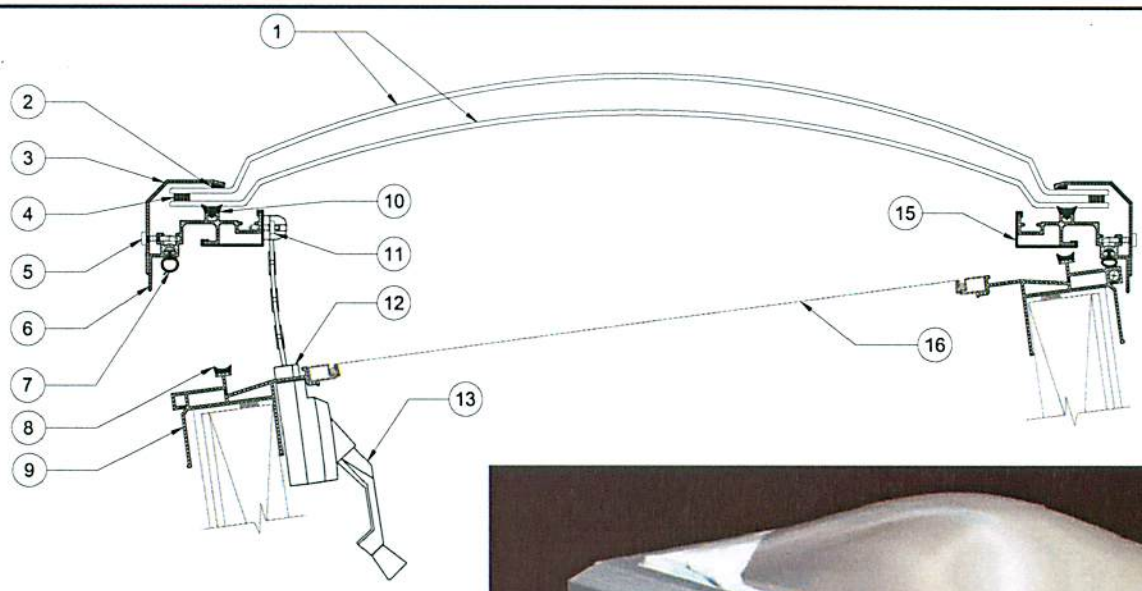
Tested by Mustafa Swalah and Ryan Huynh

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 V-PVCCM (CURBMOUNT VENTING – ACRYLIC DOME GLAZING)

	DETAIL
UNIT 1: DOUBLE DOME	1 – CLEAR ⅛" THK.
	2 – CLEAR ⅛" THK.
UNIT 2: DOUBLE DOME	1 – TRANSPARENT BRONZE ⅛" THK.
	2 – CLEAR ⅛" THK.
UNIT 3: DOUBLE DOME	1 – CLEAR ⅛" THK.
	2 – TRANSLUCENT WHITE ⅛" THK.
UNIT 4: TRIPLE DOME	1 – CLEAR ⅛" THK.
	2 – CLEAR ⅛" THK.
	3 – CLEAR ⅛" THK.
UNIT 5: TRIPLE DOME	1 – TRANSPARENT BRONZE ⅛" THK.
	2 – CLEAR ⅛" THK.
	3 – CLEAR ⅛" THK.
UNIT 6: TRIPLE DOME	1 – CLEAR ⅛" THK.
	2 – CLEAR ⅛" THK.
	3 – TRANSLUCENT WHITE ⅛" THK.

PARTS LIST

MODEL V-PVCCM (CURBMOUNT VENTING – ACRYLIC DOME GLAZING)

PARTICULAR	MANUFACTURER
1. ACRYLIC GLAZING	PLASKOLITE INC., U.S.A.
2. ⅜" x ¼" DOUBLE FACE VINYL FOAM GLAZING TAPE	GASKA TAPE INC., PART # 623012020
3. EXTRUDED ALUMINUM RETAINING FRAME-MEDIUM (6063-T5 ALLOY)	BON-L , DIE # PA-37250
4. ¼" x ⅜" DOUBLE FACE VINYL GLAZING TAPE	GASKA TAPE INC., PART # 623025022
5. #8 – 18 X ¾" ASSEMBLY SCREW	ROBERTSON, CANADA
6. EXTRUDED ALUMINUM SASH FRAME (6063-T5 ALLOY)	SPECTRA, DIE # SS-1631
7. BULB GASKET (FLEXIBLE PVC-UV STABLE)	VINYL PROFILES LTD., # V-75
8. CO-EXTRUDED RUBBER DRAFT SEAL	EXTRUSION PROFILES INC.
9. EXTRUDED RIGID THERMAL PVC CURB MOUNT FRAME	VINYL PROFILES LTD., DIE # V-413
10. SANTOPRENE CUP GASKET (UV STABLE)	VINYL PROFILES LTD., # V-76
11. #8 – 18 X ½" ASSEMBLY SCREW	ROBERTSON, CANADA
12. CHAIN DRIVE OPERATING MECHANISM	TRUTH HARDWARE, U.S.A.
13. TELESCOPING POLE-HOOK / HANDLE	TRUTH HARDWARE, U.S.A.
14. EXTRUDED RIGID PVC SASH THERMAL FRAME COVER (UV STABLE)	VINYL PROFILES LTD., # V-130
15. INSECT SCREEN	PHIFER WIRE PRODUCTS, INC., USA

Artistic
SKYLIGHT DOMES LTD

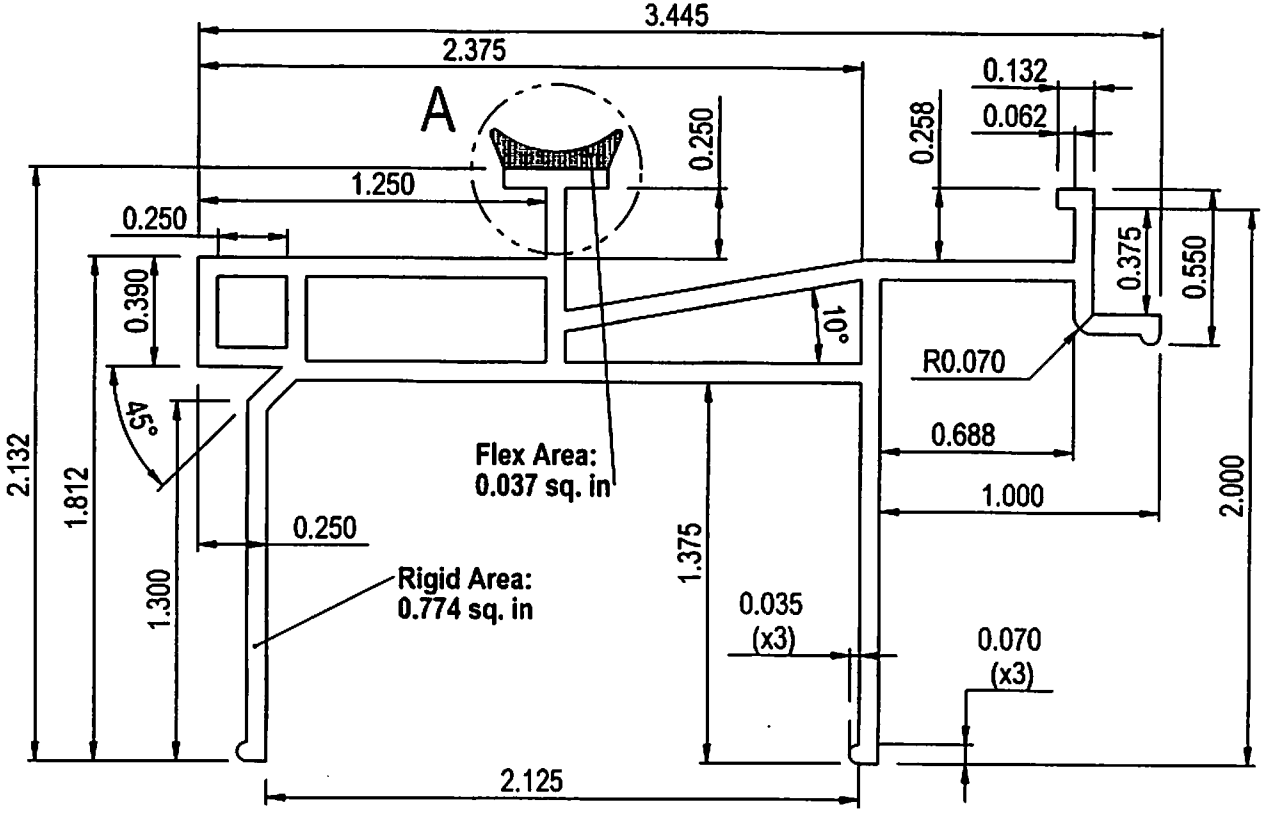
2 Guided Court
Etobicoke, Ontario, Canada M9V 4K6
E-mail: artistic@istar.ca
Web: www.artisticskylight.com

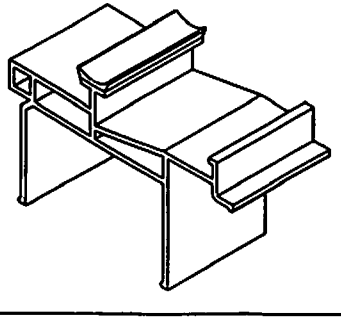
SKYLIGHT MODEL:

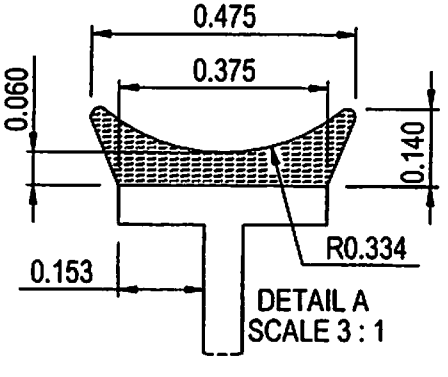
V-PVCCM

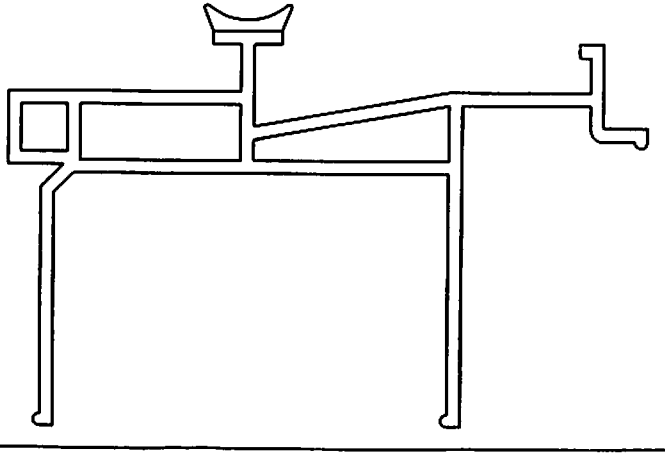
Vinyl Profiles Ltd. CUSTOM EXTRUSION 166 ROMINA DR. VAUGHAN ONT. L4K 4Z7 Tel: 1-905-669-0336 1-905-669-0337 Fax: 1-905-669-0380 E-Mail: vinylpro2ss@bellnet.ca	Customer: Artistic		Date: March 24, 2009	Die #: V-413
	Part Name: Curb Mount Frame		Scale: 1.5:1	Rack #: ----
	Drawing #: V-413	Part#: 328C	Drawn By: S. Q	Area : 0.811 sq. in
	Material: Dual PVC	Color: WHT 143 / Flex-65	Approved By:	Unit: Inch

Wall Thinkness: 0.070"
Typ. Radii: 0.015"







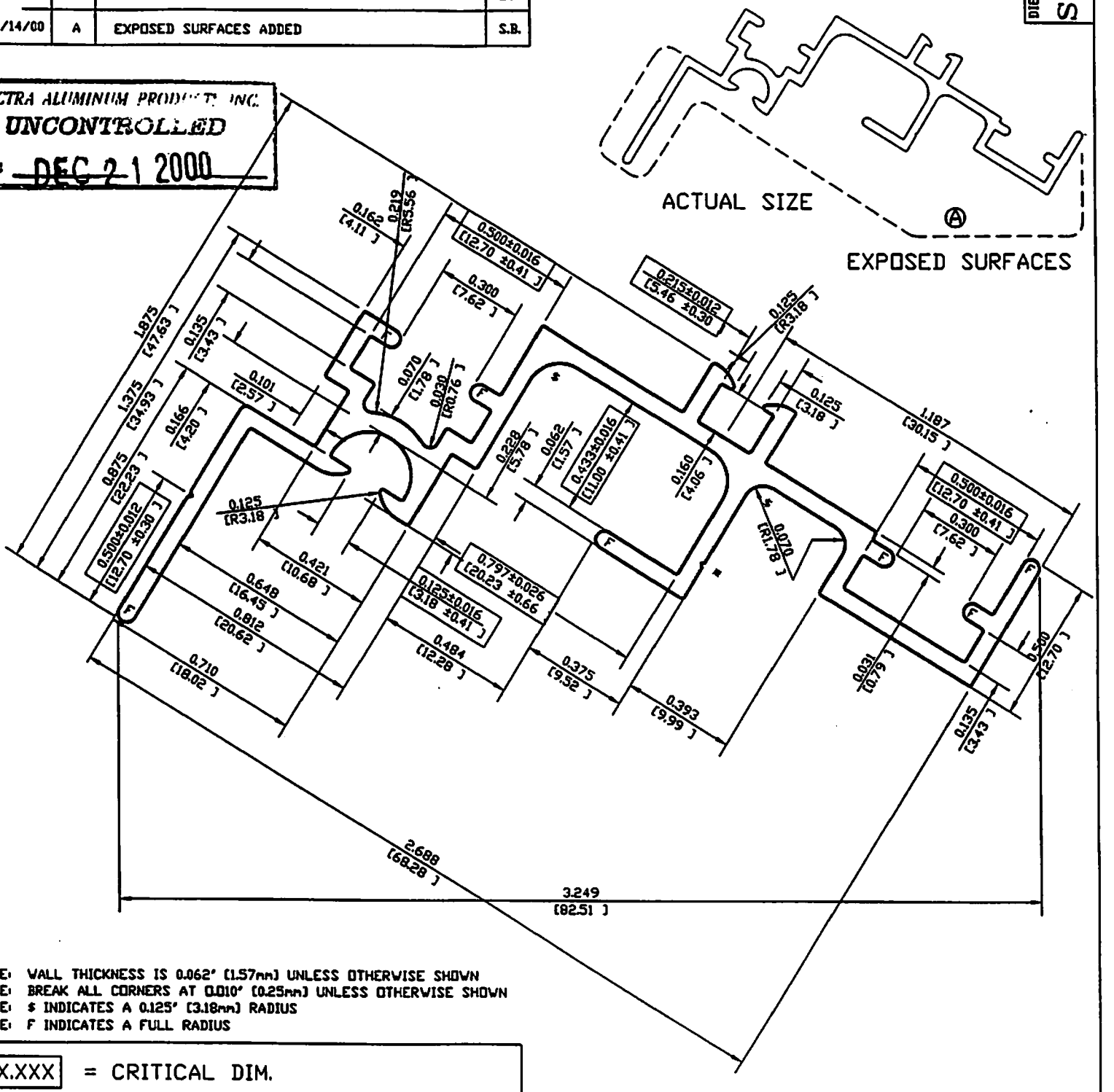


SCALE: 1:1

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

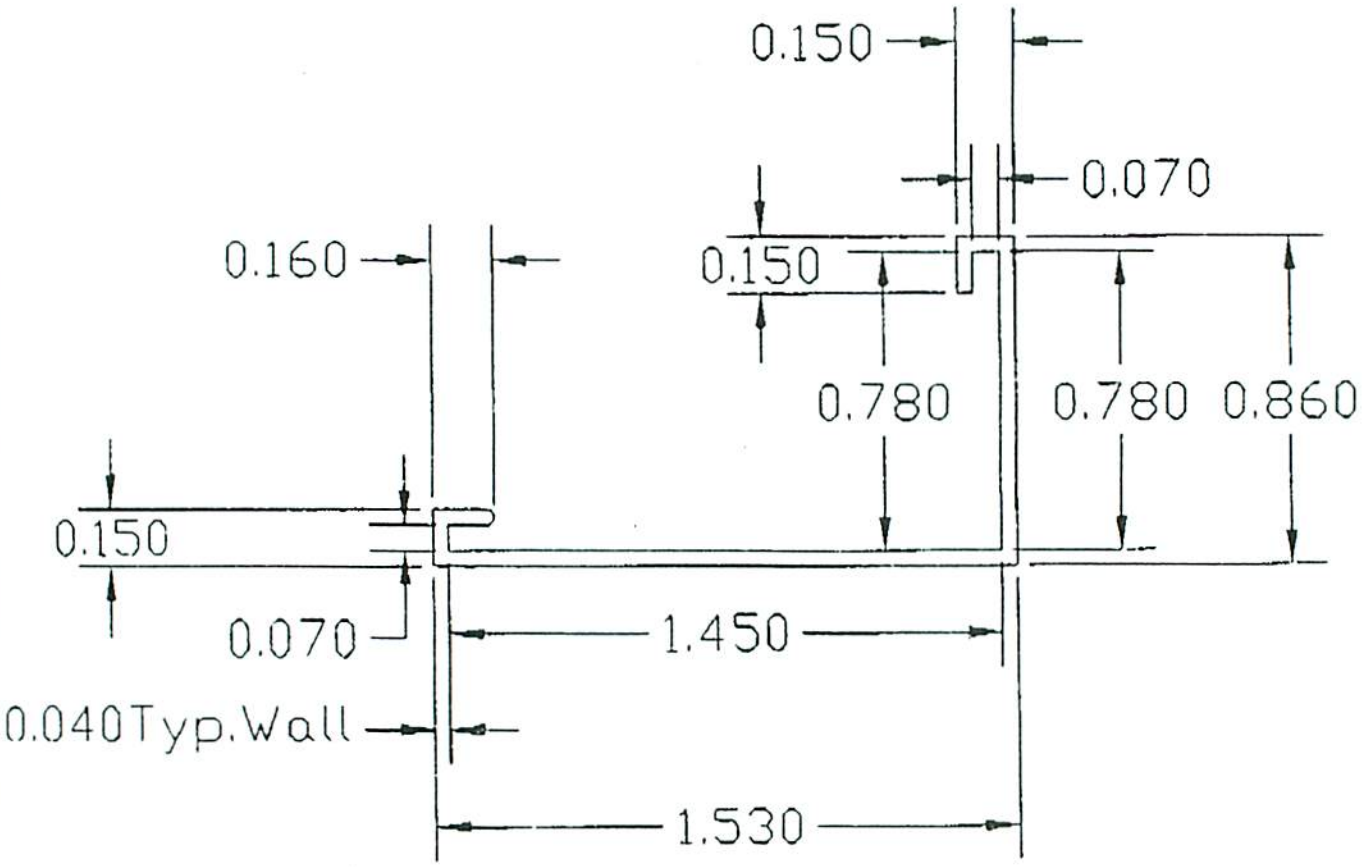
EST. AREA: 0.471 sq.in 303.87 sq.mm	OUT. PER.	In	mm
OUT. PER.: 14.280 In 362.71 mm	FACTOR:		
EST. WT.: 0.556 lbs/ft. 0.826 kg/m	C.C.D.:	In	mm

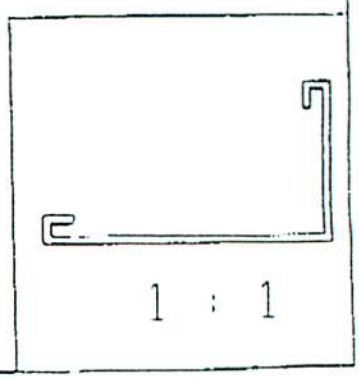
Vinyl Profiles Ltd.

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

Artistic Skylight Domes - Sash Thermal Cover

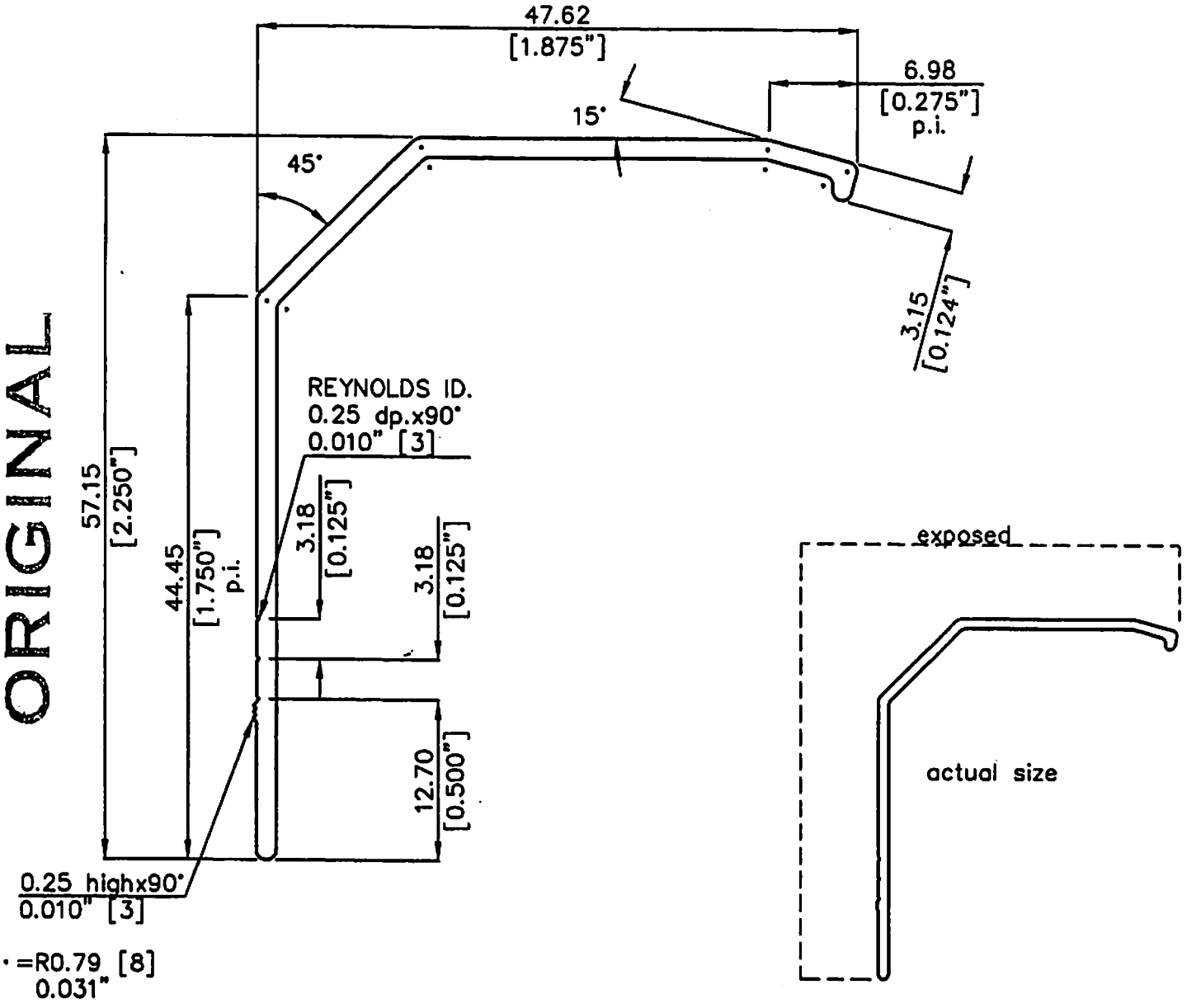
V-130





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