THERMAL SIMULATION REPORT

REPORT NUMBER: 3179893TOR-013B ER
ISSUE DATE: October 20, 2011

EVALUATION CENTER
Intertek Testing Services NA Ltd.
6225 Kenway Drive
Mississauga, Ontario L5T 2L3

RENDERED TO Artistic

Skylight Domes Ltd.
255 Regina Rd. Vaughan,
Ontario L4L 8M3

PRODUCT EVALUATED: Model GV-PVCCM Glass Curb Mount Vent Skylight

EVALUATION PROPERTY: Energy Performance

Report of a Model GV-PVCCM Glass Curb Mount Vent Skylight for compliance with the applicable requirements of the following criteria: CSA A440.2-09 *Fenestration energy performance*.

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Report of a Model GV-PVCCM Glass Curb Mount Vent Skylight for compliance with the applicable requirements of the following criteria: CSA A440.2-09 *Fenestration energy performance*.

2 Introduction

Intertek has conducted thermal performance simulations on a Model GV-PVCCM Glass Curb Mount Vent Skylight. Thermal performance simulations were conducted in accordance with the standard methods of CSA A440.2-09 "*Fenestration energy performance*".

3 Sample and Assembly Description

Model: Type:
- GV-PVCCM Venting Skylight

Manufacturer:
- Aluminum capped venting glass skylight having one top hinged projected out sash.

Simulated Size:
- Artistic Skylight Domes Ltd., 255 Regina Rd., Vaughan, Ontario L4L 8M3

Frame:
- 1200 mm × 1200 mm

Sash:
- Extruded vinyl main frame members with mitred and welded corners.
- Members: Extruded aluminum members having mitred corners. The inside perimeter of the sash was fitted with a vinyl cap having mitred corners.
- Aluminum Cap: Extruded painted aluminum alloy cap members (Bon L Die No. PA-37250) having welded mitred corners
- A painted aluminum alloy cap was modeled. It is Intertek's professional opinion that the painted cap can also be used to represent an unpainted (buffed) aluminum alloy cap.

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

Glazing Method:
- Laid in glazed on the interior on kerf inserted rubber glazing gasket, and retained with the extruded aluminum capping on the exterior. Double-sided adhesive backed closed cell foam tape measuring 3.2 mm (1/8") thick was sandwiched between the exterior face of the sealed unit and the back side of the aluminum capping.

Glazing Spacers:
- A1-D – Aluminum spacer with PIB primary seal and Polysulphide secondary seal
  A9-D – Warm Edge aluminum spacer with polymer cap. PIB primary seal and Polysulphide secondary seal
  ZR-S – Edgetech Superspacer (standard), backed with PIB

Drawings:
- *Plan and Cross-Section Drawing:*
  -Artistic Skylights Drawing model: GV-PVCCM, No Date
- *Cross-Section Details:*
  -Vinyl Profiles Limited Drawing # V-413, Part Name: Curb Mount Frame, Dated March 24, 2009
  -Bon L Canada Inc. Die # PA-37250, Titled "Artistic Skylight", Dated November 1, 1995
  -Vinyl Profiles Limited Drawing, Titled "Artistic Skylight Domes – Sash Thermal Cover", No date.
  -Spectra Aluminum Products, Die # SS-1631, Titled "Sash Frame", Rev. A, Dated November 14, 2000
  -Spectra Aluminum Products, Die # SS-3831, Titled "Big Retaining Frame PA-30833", Rev. B, Dated Mar 12/10

4 Simulation and Evaluation Methods

The skylight was simulated according to CSA A440.2-09 using specialized computer simulation software developed by the Lawrence Berkeley National Laboratory. THERM 6.3 was used to model two-dimensional heat-transfer effects in the skylight and evaluate its energy efficiency and local temperature patterns. WINDOW 6.3 was used for analyzing and calculating total skylight thermal performance indices (i.e. U-values, solar heat gain coefficients, etc). The simulation was performed using software that is consistent with the ISO 15099 standard. Skylight unit profiles were drawn into the simulation program using the electronic files from AutoCAD supplied by the client.

5 Glazing Options and Energy Rating (ER) Results

The Model GV-PVCCM Glass Curb Mount Vent Skylight achieved the following U-Value, Solar Heat Gain Coefficient (SHGC) and Energy Rating (ER) when simulated in accordance with CSA A440.2-09.

ID	Manufacturer Product Code	Frame and Glazing Details		LowE Emissivity	Gap /Fill	Spacer	Overall U-Factor ($W/m^2 \cdot °C$)	$SHGC_w$	Visual Transmittance (VT)	NRCan Energy Star® Zone
9	GV-PVCCM-GRD01	Dual Glazing Exterior - 4 mm GRD 71/38 Clear (S#2) Interior - 4 mm Clear	ID#3234 ID#3014	0.027	12.7 mm AR 90%	A1-D	3.34	0.36	0.64	--[1]
14	GV-PVCCM-LOF01	Dual Glazing Exterior - 4 mm Pilk. NA Eclipse Adv. Bronze (S#2) Interior - 4 mm Pilk. NA Energy Adv. Clear (S#2)	ID#9908 ID#9922	0.209/ 0.164	12.7 mm AR 90%	A9-D	3.23	0.32	0.30	--[1]
16	GV-PVCCM-GRD02	Dual Glazing Exterior - 4 mm GRD 71/38 Clear (S#2) Interior - 7 mm Laminated Clear	ID#3234 ID#610	0.027	12.7 mm AR 90%	ZF-S	3.32	0.35	0.63	--[1]
10	GV-PVCCM-GRD03	Dual Glazing Exterior - 4 mm GRD 71/38 Clear (S#2) Interior - 4 mm GRD 71/38 Clear (S#4)	ID#3234 ID#3234	0.027/ 0.027	12.7 mm AR 90%	ZF-S	2.93	0.33	0.55	--[1]
12	GV-PVCCM-PPG01	Dual Glazing Exterior - 4 mm PPG SolarBan 70XL Clear (S#2) Interior - 4 mm PPG Sungate 500 Clear (S#4)	ID#5433 ID#5244	0.018/ 0.215	12.7 mm AR 90%	A9-D	3.05	0.24	0.54	--[1]
13	GV-PVCCM-CIG01	Dual Glazing Exterior - 4 mm CIG LoE³ 366 Clear (S#2) Interior - 4 mm Clear	ID#2155 ID#2002	0.022	12.7 mm AR 90%	A9-D	3.34	0.26	0.58	--[1]

ID	Manufacturer Product Code	Frame and Glazing Details		LowE Emissivity	Gap /Fill	Spacer	Overall U-Factor ($W/m^2 \cdot ℃$)	$SHGC_w$	Visual Transmittance (VT)	NRCan Energy Star® Zone
15	GV-PVCCM-PPG02	Dual Glazing Exterior - 4 mm PPG SolarBan 70XL Clear (S#2) Interior - 7 mm Laminated PPG SG 500 Clear (S#4)	ID#5433 ID#604	0.018/ 0.215	12.7 mm AR 90%	A9-D	3.04	0.24	0.54	--[1]
11	GV-PVCCM-GRD04	Triple Glazing Exterior - 4 mm GRD 71/38 Clear (S#2) Middle - 4 mm GRD IS-15 Clear (S#4) Interior - 4 mm Clear	ID#3234 ID#3328 ID#3014	0.027/ 0.149	2×12.7 mm AR 90%	ZF-S	2.52	0.31	0.54	AB

Notes:

[1] Skylight does not qualify for Energy Star® in Canada
The WINDOW 6.3 output data sheets are attached to this report. Refer to Appendix B.
As per CSA A440.2-09, skylights do not receive Energy Ratings (ERs).

INTERTEK

Energy Rating Simulations by Claudio Sacilotto

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