THERMAL SIMULATION REPORT

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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 G-PVCSR Glass Self-Flashing Fixed Skylight

EVALUATION PROPERTY: Energy Performance

Report of a Model G-PVCSR Glass Self-Flashing Fixed Skylight for compliance with the applicable requirements of the following criteria: CSA A440.2-09 *Fenestration energy performance*.

1 Table of Contents

Report of a Model G-PVCSR Glass Self-Flashing Fixed 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 G-PVCSR Glass Self-Flashing Fixed 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:

- G-PVCSR Fixed Skylight

Manufacturer:

- Aluminum capped fixed glass skylight.

Simulated Size:

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

Frame

- 1200 mm × 1200 mm
- 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.
- 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.

Glazing Method:

- Laid in glazed on the interior 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 (1/4") wide by 3.2 mm (1/8") thick being sandwiched between the exterior of the glazing 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: G-PVCSR, No Date
- *Cross-Section Details:*
  -Extrusion Profiles Inc, Die # 329C, Titled "SELF FLASHING FRAME" Dated January 9, 2004
  Spectra Aluminum Products Die # SS-1880, Description: Retaining Frame, Dated (Stamped) Feb 20, 2001
  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 G-PVCSR Glass Self-Flash Fixed 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
17	G-PVCSR-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	2.44	0.36	0.65	AB
22	G-PVCSR-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	2.33	0.33	0.30	ABC
24	G-PVCSR-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	2.40	0.36	0.64	ABC
18	G-PVCSR-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	2.00	0.33	0.56	ABCD
20	G-PVCSR-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	2.14	0.24	0.54	ABCD
21	G-PVCSR-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	2.44	0.26	0.59	AB

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
23	G-PVCSR-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	2.13	0.24	0.54	ABCD
19	G-PVCSR-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	1.55	0.31	0.55	ABCD

Notes:

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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