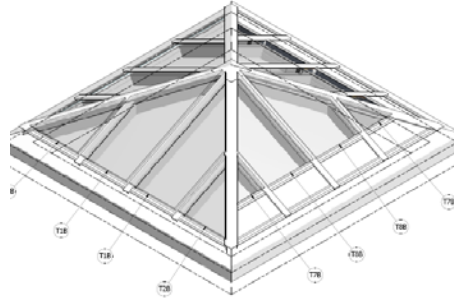


Skylight performance testing Julv 2009



UNICEL SKYLIGHTS SURPASS THE STANDARDS



Skylights not only enhance the esthetics of a house or building but they also allow more day lighting and therefore minimize cost of energy.

What makes the Unicel Architectural skylights really unique is the ability to build sophisticated skylights for different

architectural purposes such as daylight and heat control, sustainable design, enhanced aesthetics and energy savings.

Architects prefer specifying our skylights thanks to their energy efficiency features. According to recent research, a skylight with a Vision Control® glazed area of 5,000 square ft. will reduce capital cost by \$25,000 and will annually save \$18,000 in operational energy cost compared to a similar double-glazed structure.

We have given the mandate to Air-Ins Inc. with a team of engineers specialized in performance evaluation of building envelope components, to test our skylight with integrated Vision Control® units.

Air-Ins is an independent testing laboratory accredited by the Standard Council of Canada (SCC), the Canadian Standards Association (CSA), the American Architectural Manufacturers Association (AAMA) and the National Fenestration Rating Council (NFRC). They are also approved by the Florida Building Code

and recognized by the Canadian Construction Materials Centre (CCMC).

Our skylight was tested at the minimum angle, from the horizontal, such as it is designed to be installed. Only the outer perimeter of the skylight was sealed to a chamber wall.

All parts of the test specimen were at full size, using the same materials, details, and methods of construction and anchoring as used on an actual building.

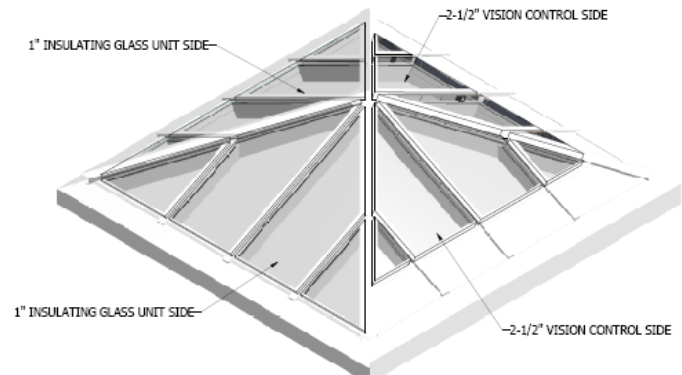
Extreme water pressure was projected from a massive 18 cylinder Pratt and Whitney airplane engine equipped with a 4.1 meter (13 foot) propeller, capable of generating wind speeds of up to 170 km/hr (106 miles/hr).

A series of tests were conducted to examine the resistance to water penetration, condensation and forced entry as well as to thermal and impact resistance. The tests were completed and the results even surpassed the standards.

Rest assured that the Unicel Architectural skylights are built to conform to the strictest standards. Contact the Unicel sales team for more information.

A video of the Air-Ins test will be added to our website this September.





1.0 INTRODUCTION

Air-Ins Inc. laboratories was retained by " **UNICEL ARCHITECTURAL** " to test a skylight according to the procedures *AAMA 501.1*, *ASTM-E283*, *ASTM-E330*, *ASTM-E331* and *ASTM-E547*. Results with reference to the *CAN/CSA A440-00* "Windows" Standard are provided for comparative purposes. The sample components and manufacturing are documented in section 3.0.

STANDARDS AND TEST PROCEDURES

- **AAMA 501.1** "Standard Test Method For Water Penetration Of Windows, Curtain Walls And Doors Using Dynamic Pressure".
- **ASTM-E283** "Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Difference Across the Specimen".
- **ASTM-E330** "Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights, and Curtain Walls by Uniform Static Air Pressure Difference".
- **ASTM-E331** "Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference".=
- **ASTM-E547** "Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference".
- **CAN/CSA A440-00** "Windows"

Testing Results



AIR-INS inc.

1320, boul. Lionel-Boulet, Varennes (Québec) J3X 1P7 – Tél. : (450) 652-0838 • Fax : (450) 652-7588 • info@air-ins.com

PERFORMANCE TESTS IN ACCORDANCE WITH *AAMA 501.1*,
ASTM-E283, *ASTM-E330*, *ASTM E331* AND *ASTM-E547* TEST PROCEDURES
 (WITH REFERENCE TO *CAN/CSA A440-00* "WINDOWS" STANDARD)

Prepared for:

UNICEL ARCHITECTURAL
 2155, rue Fernand-Lafontaine
 Longueuil, Québec, CANADA
 J4G 2J4
 Tel. 450-670-6844

SUMMARY OF RESULTS	
Product Type:	Pyramidal insulated skylight with a square base.
Product Series/Model:	Pyramidal skylight
Skylight dimensions:	3048 mm x 3048 mm x 759 mm in height (120 in. x 120 in. x 30 in height)
<i>Results with reference to ASTM testing procedures only:</i>	
Air Tightness:	$Q_{average} = 0.02 \text{ L/s}\cdot\text{m}^2$ @ 75 Pa (0.004 ft ³ /min-ft ² @ 1.57 psf) $Q_{average} = 0.06 \text{ L/s}\cdot\text{m}^2$ @ 300 Pa (0.012 ft ³ /min-ft ² @ 6.27 psf) $Q_{average} = 0.07 \text{ L/s}\cdot\text{m}^2$ @ 360 Pa (0.013 ft ³ /min-ft ² @ 7.52 psf)
Static Water Tightness:	No water infiltration under a differential pressure of 720 Pa (15 psf)
Dynamic Water Tightness:	No water infiltration under a differential pressure of 1367 Pa (29 psf) equivalent to a wind velocity of 170 km/h (106 mph).
Structural Resistance:	Negative and positive design load = 3360 Pa (70 psf)
<i>Results with reference to CAN/CSA A400-00 "Windows" Standard:</i>	
Air Tightness:	FIXED
Water Tightness:	B7
Wind Load Resistance:	C5
Condensation Resistance:	I = 56.8 for Thermo 1" option I = 62.8 for Vision Control 2-1/2" option
Test Completion Date:	07/10/2009

AIR-INS INC.

Report: AS-00248-A1
 Date: August 14th, 2009

1320 Boul. Lionel-Boulet
 Varennes, Québec
 J3X 1P7

Total of pages: 11
 Total of appendix: 3

(Tél): (450) 652-0838
 (Fax): (450) 652-7588

The results in this report relate only to the items tested. This report shall not be reproduced except in full, without the written approval of Air-Ins Inc.

Glazing (Thermo 1" sides):

- Type: Dual glazed insulated glass unit
- Total thickness: 25 mm (1 in.)
- Glass thickness: 6 mm (1/4 in) interior and 6 mm (1/4 in.) exterior.
- Type of glass: Interior laminated glass (3 mm clear + PVB 0.030 + 3 mm clear) and exterior tempered glass with LowE³-366 (Cardinal) on surface 2.
- Type of spacer: R-Max (non-conducting)
- Type of filling gas: Argon

Glazing (Vision Control 2-1/2" sides):

- Type: Dual glazed insulated glass unit with integrated louvers.
- Total thickness: 65 mm (2.56 in.)
- Glass thickness: 6 mm (1/4 in) interior and 6 mm (1/4 in.) exterior.
- Type of glass: Interior laminated glass (3 mm clear + PVB 0.030 + 3 mm clear) and exterior tempered glass with Low-E Energy Advantage (PPG) on surface 2.
- Type of spacer: Aluminium
- Type of filling gas: Air

Drainage system:

Drainage of interior cavities by the mullions, thru the exterior between the flashings.

Hardware:

Opening and closing mechanism for Vision Control sides: (1) Electric motor (Baldor Industrial Motor) per side with activating arm to operate the blades.

Video & full testing report available upon request.

Pictures

