



# **TEST REPORT**

Report No.: F8966.02-109-44

# Rendered to:

VELUX America LLC Greenwood, South Carolina

**PRODUCT TYPE**: Skylight **SERIES/MODEL**: Dynamic Single Dome Skylight Polycarbonate Smooth (6' x 6') (0.150 thickness)

**SPECIFICATION(S)**: Occupational Safety and Health Administration/U.S. Department of Labor Regulations (Standards- 29 CFR) - 1910.23(e) (8)

California Code of Regulations, Title 8, Section 3212

 Test Date(s):
 09/07/16

 Report Date:
 01/09/18

 Test Record Retention Date:
 09/07/20





1.0 Report Issued To:	VELUX America LLC 1418 Evans Pond Road P.O. Box 5001 Greenwood, South Carolina 29648-5001
2.0 Test Laboratory:	Architectural Testing, Inc., an Intertek company ("Intertek-ATI") 130 Derry Court York, Pennsylvania 17406-8405 717-764-7700

### 3.0 Project Summary:

- 3.1 Product Type: Skylight
- **3.2 Series/Model**: Dynamic Single Dome Skylight Polycarbonate Smooth (6' x 6') (0.150 thickness)
- **3.3 Compliance Statement**: Results obtained are tested values and were secured by using test method(s) intended to address the designated performance specifications.
- 3.4 Test Date(s): 09/07/16
- **3.5 Test Record Retention End Date**: All test records for this report will be retained until September 7, 2020.
- **3.6 Test Location**: Intertek-ATI test facility in York, Pennsylvania.
- **3.7 Test Specimen Source**: The test specimen(s) was provided by the client. Representative samples of the test specimen(s) will be retained by Intertek-ATI for a minimum of two years from the test completion date.
- **3.8 Drawing Reference**: The test specimen drawings have been reviewed by Intertek-ATI and are representative of the test specimen(s) reported herein. Test specimen construction was verified by Intertek-ATI per the drawings located in Appendix B. Any deviations are documented herein or on the drawings.
- 3.9 List of Official Observers:

company
Intertek-ATI





### 4.0 Test Method (intended to address listed specification(s)):

Occupational Safety and Health Administration/U.S. Department of Labor Regulations (Standards- 29 CFR) - 1910.23(e) (8)

California Code of Regulations, Title 8, Section 3212

A 400 lb. weight, fabricated from a bag filled with lead shot, was placed on the center of the dome for a minimum of 60 seconds. The bag was removed and the test unit was inspected for any signs of damage or failure.

Additional Loading:

The specimen was taken to failure using sandbags placed on the center of the dome for a minimum of 60 seconds. The highest load causing penetration or damage was recorded.

#### 5.0 Evaluation Scope:

Intertek Building & Construction (B&C) was contracted by VELUX America LLC, 1418 Evans Pond Road on December 4, 2017 to evaluate the OSHA fall protection testing to the most recent referenced document. Occupational Safety and Health Administration (OSHA)/U.S. Department of Labor Regulations Standard 29 CFR §1910.29 – Fall protection systems and falling object protection-criteria and practices. Section 1910.29(e)(1) requires a cover to be capable of supporting without failure at least twice the maximum intended load that may be imposed on the cover at any one time.

Intertek Building & Construction (B&C) was contracted by VELUX America LLC, 1418 Evans Pond Road on December 4, 2017 to evaluate the Cal/OSHA fall protection testing to the most recent referenced document. California Code of Regulations, Title 8, Section 3212 §(b), which states, "covers shall be capable of safely supporting the greater of 400 lbs or twice the weight of the employees, equipment and materials that may be imposed on any one square foot area of the cover at any time."





## 6.0 Test Specimen Description:

#### 6.1 Product Sizes:

<b>Overall Area</b> : 42.1 ft <sup>2</sup>	Width (inches)	Height (inches)
Overall size	77-7/8	77-7/8

#### 6.2 Frame Construction:

Frame Member	Material	Description
Inner frame	Aluminum	Extruded
Dome clamp cover	Aluminum	Extruded

	Joinery Type	Detail
All corners	Mitered	Miter cut and welded

## 6.3 Reinforcement: No reinforcement was utilized

## 6.4 Weatherstripping:

Description	Quantity	Location
Custom-shaped gasket	1 row	Located around the interior perimeter of the inner frame
Gasket wick	1 per corner	Located at each mitered corner of the custom-shaped gasket

### 6.0 Test Specimen Description: (Continued)

**6.5 Glazing**: No conclusions of any kind regarding the adequacy or inadequacy of the poly smooth in any glazed test specimen(s) can be made.

Glazing Type	Glazing Method
5/32" poly smooth	The glazing was set from the exterior onto a custom-shaped gasket against the extruded aluminum frame. The glazing was secured using an aluminum extruded dome clamp cover with a bead of sealant on the glazing. The dome clamp cover was secured using spring clips and #10 x 5/8" self-tapping screws located 2" from all corners and 12" on center.

Location	Quantity	Daylight Opening (inches)	Glazing Bite (inches)
Dome	1	72-1/2 x 72-1/2	7/8





**7.0 Installation:** The specimen was installed into a Spruce-Pine-Fir wood buck.

Location	Anchor Description	Anchor Location
Aluminum framo	$#10 \times 1.1/2"$ pap boad corow	8-1/2" from corners, 12" on
Aluminum trame	#10 x 1-1/2 part head screw	center

8.0 Test Results: The results are tabulated as follows:

## 8.1 California (and OSHA) minimum loading:

Test Load	Load Location	Results
400 lbf	Center of dome	No visible damage

*Note*: The 400 lbf weight was gently applied perpendicular to the center of the dome. After 60 seconds of rest time, there was no visible damage to the glazing.

## 8.2 Additional loading (applied on the same unit in the listed order):

Test Load	Load Location	Results
501 lbf at rest	Center of dome	No visible damage
604 lbf at rest	Center of dome	No visible damage
706 lbf at rest	Center of dome	No visible damage
807 lbf at rest	Center of dome	No visible damage
909 lbf at rest	Center of dome	No visible damage
1009 lbf at rest	Center of dome	No visible damage
1112 lbf at rest	Center of dome	No visible damage
1215 lbf at rest	Center of dome	Corner welds cracked
1317 lbf at rest	Center of dome	No visible damage
1418 lbf at rest	Center of dome	No visible damage
1520 lbf at rest	Center of dome	No visible damage
1622 lbf at rest	Center of dome	Deglazing around corners
1723 lbf at rest	Center of dome	See Note #1

*Note #1*: At 1723 *lbf, the load created on opening larger than one square foot.* 





## 9.0 Conclusion:

The specimen was evaluated in accordance with Occupational Safety and Health Administration (OSHA)/U.S. Department of Labor Regulations Standard 29 CFR §1910.29(e)(1) to be capable of supporting twice the maximum intended load, up to (760) ft-lb.

The specimen was evaluated in accordance with California Code of Regulations, Title 8, Section 3212 §(b) to be capable of safely supporting loads exceeding 400 ft-lb.

Intertek-ATI will service this report for the entire test record retention period. Test records such as detailed drawings, datasheets, representative samples of test specimens, or other pertinent project documentation, will be retained by Intertek-ATI for the entire test record retention period.

This report does not constitute certification of this product nor an opinion or endorsement by this laboratory. It is the exclusive property of the client so named herein and relates only to the specimen(s) tested. This report may not be reproduced, except in full, without the written approval of Intertek-ATI.

For ARCHITECTURAL TESTING, Inc.

Joel Chronister
Technician

Timothy J. McGill Manager – Product Testing

JC:asm/abo

Attachments (pages): This report is complete only when all attachments listed are included. Appendix-A: Photograph(s) (1) Appendix-B: Drawing(s) (16)

This report produced from controlled document template ATI 00514, revised 06/26/14.





# Appendix A Photograph(s)



Photo No. 1 View of Tested Specimen



Photo No. 2 View of Tested Specimen





Appendix B

Drawing(s)



8

	PART SCHEDULE									
ITEM	QTY.	PART	PART NO.	DESCRIPTION	Categor	DRAWING NC	). Operatio	n Edition	COMMENTS	
Α	1	Dynamic exterior dome		Polycarbonate, or acrylic, or impact modified acrylic	21	3036150AC	32	02	Thermoformed exterior dome	
		Inner frame			21	302359000	oc	01	Profile	
	4		302359	6063/T5 Aluminum	21	3023590AC	31	02	Cutting and punching	
	-		002000	Powder coat color: NCS S 7500-N (Grey)	21	3023590AC	39	02	Powder coat	
					21	3023590AC	42	02	Welding	
N/A	N/A	Primer	N/A	Clamp cover, Inner Frame, & Domes	21	3023590AC	52	01	Primer placement	
		Dome clamp cover		6063/T5 Aluminum Powder coat color: NCS S 7500-N (Grey)	21	302361000	oc	01	Profile	
D	4		302360		21	3023610AC	31	02	Cutting and drilling	
					21	3023610AC	39	02	Powder coat	
					21	3023600AC	42	01	Welding	
E	N/A	Commercial sealant	305660	Silicone for commercial application	21	3036600AC	52	02	Silicone placement	
					21	303612000	oc	01	Profile	
F	4	Hiah profile aasket	303612	TPF Color: Black	21	303611000	39	01	Gasket groove cutting	
					21	3036110AC	31	01	Gasket cutting	
					21	3036110AC	42	02	Gasket welding	
∥ н*	4	Gasket wick	305659	Polyethelene felt for wicking	21	305659000	oc	02	Profile/cutting	
					21	3056590AC	52	02	Wick placement	
	#	Spring clip	306222	301 Spring Temper Stainless Steel	21	306222000	oc	01		
	"				21	3062220AC	52	02	Spring clip placement	

	FASTENER SCHEDULE									
ITEN	ΙQTY	. PART	PART NO.	DESCRIPTION	Category	DRAWING NO Commodity No.	• Operation	Edition	COMMENTS	
J	#	Torx screw	306225	Torx Pan head, SST, #2 drill point #10-16x5/8"	21	306225000	00	01	Commodity drawing	

# **GENERAL NOTES**

- \* Not Visible in this drawing
- 1. Unless noted otherwise, all parts listed are for CD1, CE1, CT1, CG1, CH1, CJ1 Commercial Dome skylights.
- 2. A copy of this drawing plus any other supplemental documentation regarding this skylight model will be maintained at the Skylight Technical Database in the following category location Technical Data/Submittal Data/
- 3. Horizontal and Vertical Frame Cross-Section part sizes, materials and assembly are identical.
- Inner frame.
- 5. The CDx skylight installs directly on site built or prefabricated curbs, provided by others.

Size	Throat dimension mm	Product dimension mm
2′	717	758
3′	1022	1063
4′	1326.5	1368
5′	1631.5	1672.5
6′	1936	1977.5
7′	2241	2282
8′	2546	2857
10'	3155.5	3197
225	743	784
305	946	987
345	1047.5	1088.5
465	1352.5	1393.5

3

4. #8 or larger stainless steel installation fasteners, appropriate for supporting structure. Provided by others. One fastener per hole of



THIS DRAWING IS THE SOLE PROPERTY OF VELUX AMERICA INC. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF VELUX AMERICA IS PROHIBITED.							s prohibited.			
dimensions are in $MM$ general tolerances: angular: $\pm 1$ one place decimal : $\pm 0.5$	NDTE:	VE	LUX	SKY-GPM 1418 Evans Pond Road PO Box 5001 Greenwood, South Carolina 29648-5001						
WATERIAL			Commercial Single Dome Skylight							
SPECIFICATION			CD1, CE1, CT1, CG1, CH1, CJ1							
FINISH		Typical Arrangement with								
SPECIFICATION			Product List of Parts							
STANDARDS		SIZE COM B 21.	ODITY NO. CD1CE1.0A	0.63 01	scale: 1:1	CKD/DRAWN/DATE SHEET 1	RLE/JDH 04/06/2016 OF 1			
1										



This drawing must not be copied, published or used in any other way without permission 🛛 VELUX A/S reg. office: Ådalsvej 99, DK-2970 Hørsholm. CVR-no. 30003519

	Edition	Description of chan	ge		Date
	02	Added note			3/29/16
	li	7		X	
2		õ	$\beta$	//	
	_//		K -		$\rightarrow$
2		629 - 629			≓
<sup>¬</sup> ▮					/
1				/	/
	C	DE	TAIL G		
SCALE 1	:5	Rik	Detail		
		30			
50mm f	lat				
			f		
			<b>T</b>		
		$\sim$			
	~ • • •				
(	1) W =	±3			
	SECTION	N A-A			
	_				
		VELUX Amorica I			
			<i>IC.</i>		
		CONFIDENTIAL			
	C				
		Specifications - ger	nerally		
sion	Polycarb	onate/Acrylic Alloy	309079.6	4	
	Impact r	modified acrylic (Outer dome)	309209.6	4	
	Impact r	modified acrylic (Inner dome)	309210.6	4	
	CDx.		505052.0	· r	
48		<u> </u>			
	Dome	9			
	1				
		Product instructions no.			e 197
	Category	303615	0.4.0	Operation	Edition
	Z1	202012	UAU	32	02











					02	Added CG2 sizes		3/22/16
are typ.				ETAIL A ALE 2 : 1	Reg 35	gardless of tolerance `cut must extend pas	t this leg	
		2 2 3 4 5 6 7 8 10	Size         foot         foot <t< th=""><th>L 757 1062 1366 1671 1976 2281 2586 3195 719 922 1024 1329</th><th></th><th>Number of holes         2         3         4         5         6         7         8         10         2         3         4</th><th></th><th></th></t<>	L 757 1062 1366 1671 1976 2281 2586 3195 719 922 1024 1329		Number of holes         2         3         4         5         6         7         8         10         2         3         4		
erica Inc. VTIAL	VELUX 450 Old Brid Approvals Checked by/drawn /REC/21.03.2 Scale 1:1 This drawing must pot	SKY ckyard Rd., Gree by/date 2016 Unspec. meas. mm be copied, publisher	-PRS enwood, South Card General tolerance ±1 dor used in any other	blina 29648 Size C vay without permission	CDx,C Inner Cuttir	CEx,CTx,CGx,CHx,CJx frame ng and punching Product instructions no. <b>302359</b> VELUX A/S reg. office: Ådalsvei 99. DK-7	0A0 Operation 31	Edition 02

Edition

Description of change

Date



	21	302359	0A0	42	02
	Category			Operation	Edition
		Draduct instructions			
7040	Dome Weldi	inner frame ng			
9648	<u>CDx,C</u>	CEx,CTx,CGx,CHx,CJx			
: 1					
D					
			)		
			D		
$\square$	— Max. 1m	m misalignment allowed			
	0				
5mm		$\sim$			
			1		
			k		
		<b>TII</b> -II-			
	/-				
			7		
	02	Added view "Detail	D"		3/28/16
	Edition	Description of chan	ge		Date



This drawing must not be copied, published or used in any other way without permission







9648	CDx,CEx,CTx,CHx,CGx,CJx         Dome clamp cover Cutting and drilling         Product instructions no.         Operation Edition         21       302361       0A0       31       02				
		Product instructions no.			
	Category			Operation	Edition
	21	302361	0A0	31	02
out permissior	ם ו	VELUX A/S reg. office: Ådalsvej 99, DK-2	970 Hørsho	lm. CVR-no.	30003519





	Report #:	F8966.01-109-18
ntertek	Date:	09/08/16
	Verified by:	Jul Chromits



Measure	Tol.
< 2.5	0.35
2.5-4	0.4
4-6.3	0.5
6.3-10	0.7
10-16	0.8
16-54	1

Angles ± 1°



This drawing must not be copied, published or used in any other way without permission

VELUX A/S reg. office: Ådalsvej 99, DK-2970 Hørsholm. CVR-no. 30003519



Edition	Description of change	Date



SolidWorks

This drawing must not be copied, published or used in any other way without permission

Ŋ								1
Nork					Edition	Description of chan	ge	Date
olid/		Poport #.	E8066 01 -	109-18	02	Revised material descrip	otion	3/29/16
	ertek 🔺	neport #:	09/08/	/16				-
		Verified h	v: Jul Chr	mit				
				_				
			25	5 ±2		6.35		
						(1/4)		
		<b>—</b>					<u> </u>	
							Ţ	
							6	
						VELUX Ameri	ca Inc.	
						CONFIDENT	ΙΔΙ	
						CONTIDENT		
	r	Mater	ial		_	Specifications - ge	nerally	
Wool felt	tor wicking (grey		DC		Foam gas	Ket wick mat'l commercial dom	es 309212.64	
<b>VEL</b> 450	UA Old Brickvard R	Jr ۲-۲ d., Greenwo	へ <b>う</b> ood, South Card	olina 29648				
Approvals					Gasket	wick		
	TMA-B				Drofile/	cutting		
Checked I	oy/drawn by/date				FIOHIe/	cutting		
/MM/2	9.03.2016				Catacany	Product instructions no.	Onerotic	n Edition
Scale	Unspec.	meas. O	General tolerance	Size		305659		
2:1	mm		<b>-</b> T	A		505055		UΖ

				Edition	Description of chan	nge Do	
	Repor	t #: F8966.01-	109-18	02	Added note	3/2	
Interte	Date:	09/08	/16				
	Verifie	ed by: Jul Ch	mit				
				Wic bey	k must not extend rond this surface		
					Wick must contac	ct all 4 posts	
		E SC	Detail a				
		Place wick	s in all four cor	ners			
					VELUX Ame CONFIDEN	erica Inc. ITIAL	
VELUX	SKY-	-PRS	-line 20649	CDx,CE	x,CTx,CGx,CHx,CJx		
450 Old E Approvals	опскуага ка., Greei	iwoou, South Car	אווום 29648	Gasket			
				Wick placement			
Checked by/drav	Checked by/drawn by/date /MM/29.03.2016				Product instructions po		
Scale	Unspec. meas.	General tolerance	Size	Category		Operation Edit	
1:10	mm	±1	A	21	202029	0A0 52 0	



This drawing must not be copied, published or used in any other way without permission