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SNO-SAFE SNOW GUARDS, LLC
TEST REPORT

SCOPE OF WORK
SHEAR PERFORMANCE EVALUATION OF POLYCARBONATE SNOW GUARDS

REPORT NUMBER
N6309.01-106-31 R0

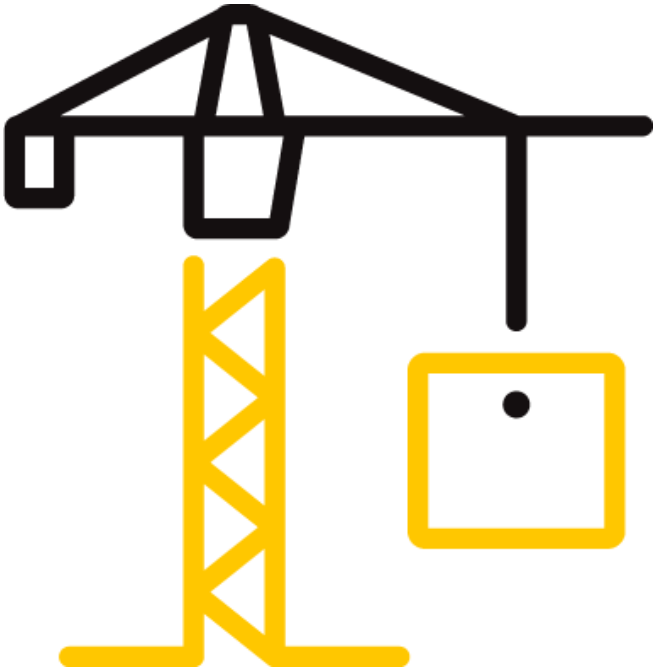
TEST DATE
04/29/22

ISSUE DATE
05/10/22

RECORD RETENTION END DATE
04/29/26

PAGES
12

DOCUMENT CONTROL NUMBER
RT-R-AMER-Test-2827 (09/09/21)



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TEST REPORT FOR SNO-SAFE SNOW GUARDS, LLC
Report No.: N6309.01-106-31 R0
Date: 05/10/22

REPORT ISSUED TO

SNO-SAFE SNOW GUARDS, LLC
P.O. Box 541
Chicopee, Massachusetts 01021

SECTION 1

SCOPE

Products: Polycarbonate Snow Guards

Architectural Testing, Inc. (an Intertek company) dba Intertek Building & Construction (B&C) was contracted by Sno-Safe Snow Guards, LLC to evaluate polycarbonate snow guards in accordance with general engineering principles and client specified instructions for Shear Performance. Results obtained are tested values and were secured by using the designated test methods. Testing was conducted at the Intertek B&C test facility in York, Pennsylvania.

This report does not constitute certification of this product nor an opinion or endorsement by this laboratory.

Unless differently required, Intertek reports apply the "Simple Acceptance" rule, also called “Shared Risk approach,” of ILAC-G8:09/2019, Guidelines on Decision Rules and Statements of Conformity.

For INTERTEK B&C:

COMPLETED BY:	Joshua A. Kennedy	**REVIEWED BY:**	Joseph M. Brickner
TITLE:	Technician III Materials Laboratory	**TITLE:**	Laboratory Supervisor Materials Laboratory
SIGNATURE:	Joshua A Kennedy Digitally Signed by: Joshua Kennedy	**SIGNATURE:**	Joseph M. Brickner Digitally Signed by: Joseph M. Brickner
DATE:	05/10/22	**DATE:**	05/10/22

JAK:jmb/alts

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SECTION 2
SUMMARY OF TEST RESULTS

PRODUCT	ATTACHMENT DETAIL	AVERAGE MAXIMUM FORCE
Polycarbonate Wide Snow Guards	Adhesion only	2,480 lb_f
	Adhesion and fasteners	2,410 lb_f

SECTION 3
TEST METHODS

The specimens were evaluated in accordance with the general engineering principles and client specified instructions for shear performance.

SECTION 4
MATERIAL SOURCE

The snow guard materials were provided by Sno-Safe Snow Guards, LLC. The following were received in acceptable condition on 04/14/2022:

- Six (6) nominally 5.25-inch wide by 3.13-inch high by 3.13-inch deep polycarbonate snow guards mounted to 12-inch square by 0.75-inch thick plywood with an attached metal roofing panel by adhesion
- Six (6) nominally 5.25-inch wide by 3.13-inch high by 3.13-inch deep polycarbonate snow guards mounted to 12-inch square by 0.75-inch thick plywood with an attached metal roofing panel by adhesion and fasteners

Refer to the product description photos in Section 10. The materials were tested as received. Representative materials/test specimens will be retained by Intertek B&C for a minimum of four years from the test completion date.

SECTION 5
LIST OF OFFICIAL OBSERVERS

NAME	COMPANY
Joshua A. Kennedy	Intertek B&C
Joseph M. Brickner	Intertek B&C

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SECTION 6
TEST PROCEDURE

All conditioning of test specimens and test conditions were at standard laboratory conditions unless otherwise reported. Refer to the test photos in Section 10 and datasheets in Section 11. Calibration certificates available upon request.

Shear Properties
The shear load of the snow guards was determined utilizing a SATEC UTM (ICN: Y002011) equipped with a 5,000 lb_f load cell (ICN: 65607) operating at a crosshead speed of 2.0 in/min. A plywood board with an attached metal roofing panel was secured to the stage and a distributed shear force was applied to the snow guard until a failure mode was observed.

SECTION 7
TEST SPECIMEN DESCRIPTIONS

TEST PROCEDURE	NUMBER OF SPECIMENS	NOMINAL SPECIMEN DIMENSIONS	VISUAL CHARACTERISTICS
Shear Properties	6	5 x 3 x 3 inch	Clear white adhesive
	6	5 x 3 x 3 inch	Grey fasteners

SECTION 8
TEST RESULTS

Shear Properties

Adhesive Only

SPECIMEN	PEAK FORCE (lb_f)	DISPLACEMENT AT PEAK FORCE (in)	SHEAR MODULUS (psi)	FAILURE MODE
1	1,690	0.210	22,000	Adhesive Slid
2	2,090	0.223	23,200	Adhesive Slid
3	2,730	0.520	39,400	Metal Panel Slid
4	2,570	0.432	30,700	Metal Panel Slid
5	2,800	0.575	34,700	Metal Panel Slid
6	3,000	0.373	32,500	Metal Panel Slid
Average	**2,480**	**0.389**	**30,400**	

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Adhesive and Fasteners

SPECIMEN	PEAK FORCE (lb_f)	DISPLACEMENT AT PEAK FORCE (in)	SHEAR MODULUS (psi)	FAILURE MODE
1	2,190	0.372	22,000	Fastener Rip Out
2	2,720	0.167	34,400	Guard Rupture
3	2,230	0.125	34,800	Fastener Rip Out
4	2,460	0.222	29,800	Fastener Rip Out
5	2,440	0.612	31,400	Fastener Rip Out
6	2,430	0.615	31,000	Fastener Rip Out
Average	**2,410**	**0.352**	**30,600**	

SECTION 9
CONCLUSION

The requested test method does not contain specific performance requirements. Results are reported as obtained.

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SECTION 10
PHOTOGRAPHS

Photo No. 1
Material, As Received

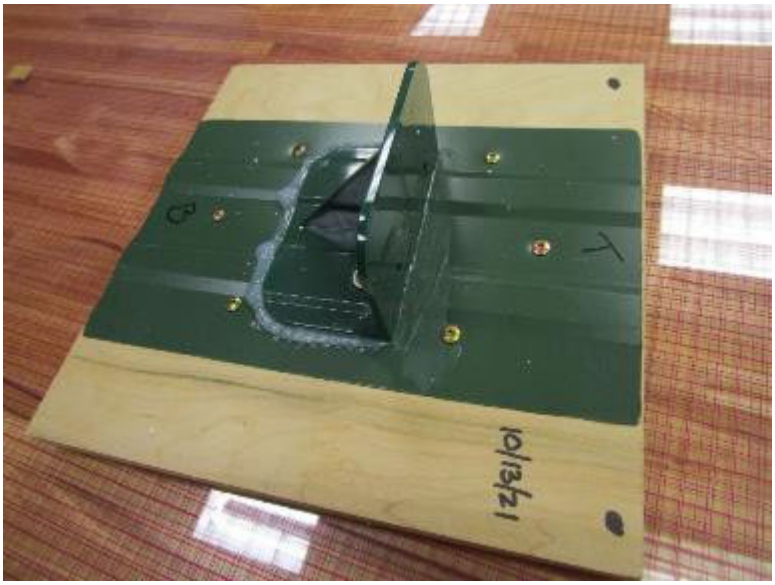

Photo No. 2
Typical Snow Guard Assembly Detail

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Photo No. 3
Typical Shear Test Setup Detail

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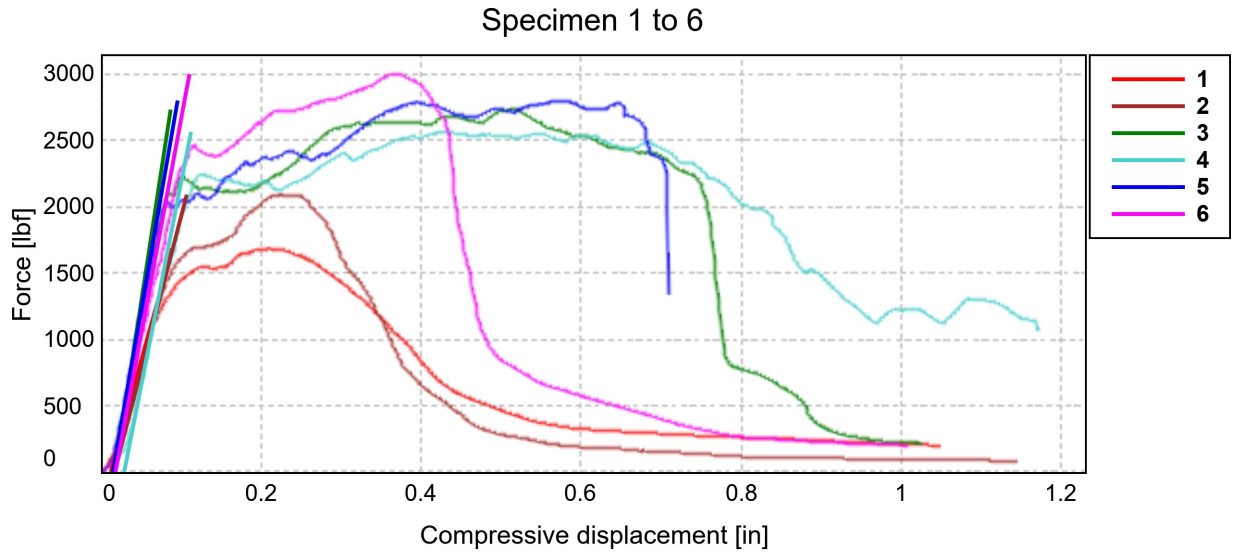
SECTION 11
DATA SHEETS

Custom Shear

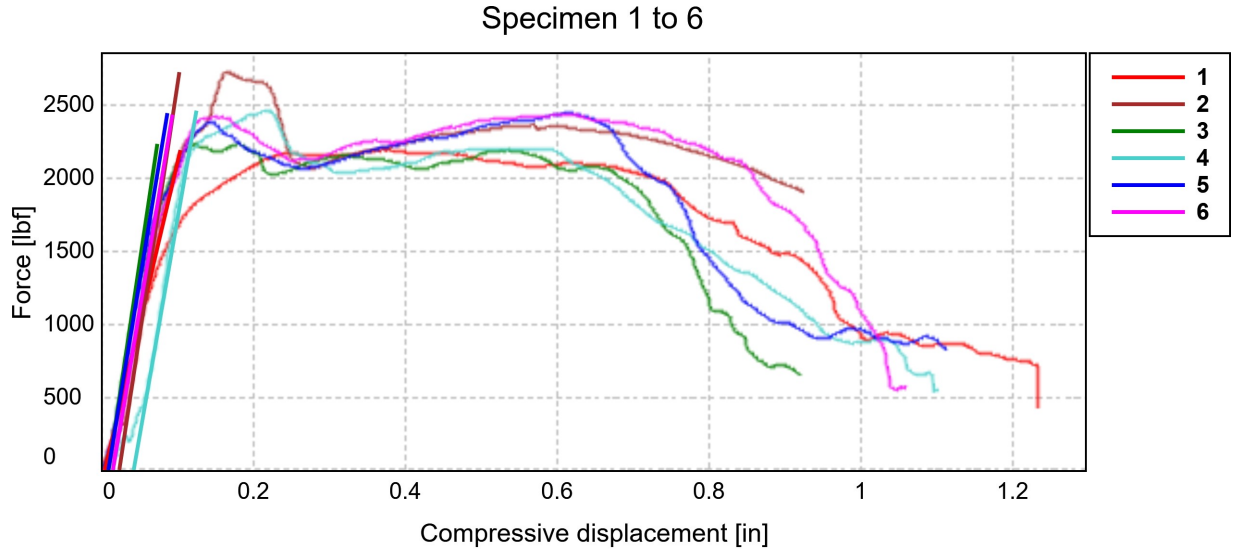
Intertek-ATI Project	N6309.01-106-31
Client Name	Sno-Safe Snow Guards, LLC
Sample Description	Polycarbonate Snow Guard, 180-Day Cure
Attachment	Adhesion Only
Rate 1	2.00 in/min
Load Cell / ICN	5,000 lbf / 65607
UTM Frame / ICN	SATEC 50UD / Y002011
Temperature	70.2 F
Humidity	45.1 %
Technician	Josh K.



	Specimen	Maximum Load [lbf]	Deflection [in]	Shear Modulus [psi]	Failure Mode
1	P-A-1	1690	0.210	22000	Adhesive Slide
2	P-A-2	2090	0.223	23200	Adhesive Slide
3	P-A-3	2730	0.520	39400	Metal Panel Slide
4	P-A-4	2570	0.432	30700	Metal Panel Slide
5	P-A-5	2800	0.575	34700	Metal Panel Slide
6	P-A-6	3000	0.373	32500	Metal Panel Slide
Mean		2480	0.389	30400	
Std Dev		495.97	0.15	6722.07	

Custom Shear

Intertek-ATI Project	N6309.01-106-31
Client Name	Sno-Safe Snow Guards, LLC
Sample Description	Polycarbonate Snow Guard, 180-Day Cure
Attachment	Adhesion and Fasteners
Rate 1	2.00 in/min
Load Cell / ICN	5,000 lbf / 65607
UTM Frame / ICN	SATEC 50UD / Y002011
Temperature	70.2 F
Humidity	45.1 %
Technician	Josh K.



	Specimen	Maximum Load [lbf]	Deflection [in]	Shear Modulus [psi]	Failure Mode
1	P-F-1	2190	0.372	22000	Fastener Rip Out
2	P-F-2	2720	0.167	34400	Guard Rupture
3	P-F-3	2230	0.125	34800	Fastener Rip Out
4	P-F-4	2460	0.222	29800	Fastener Rip Out
5	P-F-5	2440	0.612	31400	Fastener Rip Out
6	P-F-6	2430	0.615	31000	Fastener Rip Out
Mean		2410	0.352	30600	
Std Dev		190.88	0.22	4641.89	

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SECTION 12
REVISION LOG

REVISION #	DATE	PAGES	REVISION
0	05/10/22	N/A	Original Report Issue