

IMPACT SECURITY, LLC TEST REPORT

SCOPE OF WORK

ASTM E1886 AND ASTM E1996 TESTING ON DEFENSELITE PRO, HURRICANE STORM SHUTTER

REPORT NUMBER

N2702.01-109-44

TEST DATES

04/27/22 - 04/28/22

ISSUE DATE

06/23/22

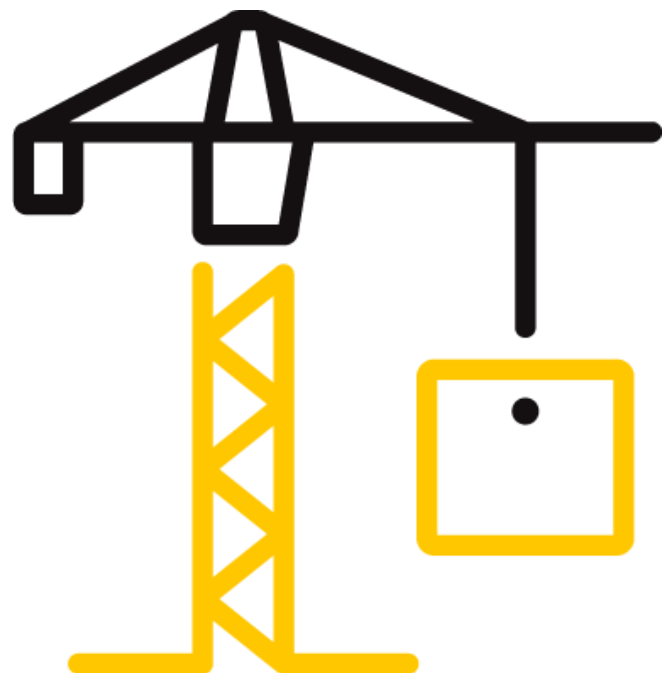
PAGES

10

DOCUMENT CONTROL NUMBER

RT-R-AMER-Test-2806 (06/15/21)

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TEST REPORT FOR IMPACT SECURITY, LLC

Report No.: N2702.01-109-44

Date: 06/23/22

REPORT ISSUED TO

IMPACT SECURITY, LLC

600 Kirk Road, #100

Marietta, Georgia 30060

SECTION 1

SCOPE

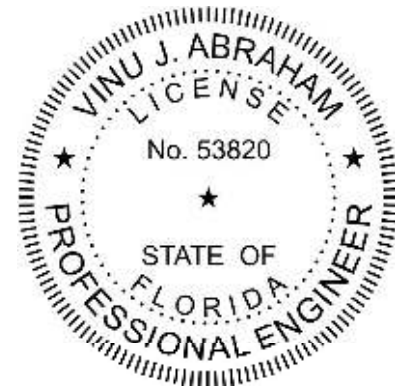
Architectural Testing, Inc. (an Intertek company), dba Intertek Building & Construction (B&C) was contracted by Impact Security, LLC to perform testing in accordance with ASTM E1886 and ASTM E1996 on their DefenseLite Pro, hurricane storm shutter. Results obtained are tested values and were secured by using the designated test method(s). Testing was conducted at Intertek B&C test facility in York, Pennsylvania.

SECTION 2

SUMMARY OF TEST RESULTS

TITLE	RESULTS
±4405 Pa (±92.0 psf) Design Pressure	Did not meet performance requirements*
Missile Impacts	Missile Level E – Wind Zone 4

*Only one specimen tested and therefore does not comply with the test standard that requires three.



For INTERTEK B&C:

COMPLETED BY:	Kenneth L. Wymer	REVIEWED BY:	Vinu J. Abraham, P.E.
TITLE:	Technician – Product Testing	TITLE:	Vice President – Products Building & Construction
SIGNATURE:		SIGNATURE:	
DATE:	06/23/22	DATE:	06/23/22 2022.06.23 11:25:21 -04'00'

KLW:nls

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SECTION 3

TEST METHOD(S)

The specimen was evaluated in general accordance with the following:

ASTM E1886-19, *Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials*

ASTM E1996-20, *Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes*

SECTION 4

MATERIAL SOURCE/INSTALLATION

Test specimen was provided by the client. Representative samples of the test specimen will be retained by Intertek B&C for a minimum of four years from the test completion date.

The specimen was installed into a Spruce-Pine-Fir wood buck. The rough opening allowed for no shim space. The interior and exterior perimeters of the window were sealed with silicone.

LOCATION	ANCHOR DESCRIPTION	ANCHOR LOCATION
Head, sill, and jambs	1" x 2" wood blind stop located on the exterior perimeter and the interior perimeter	<p>The exterior blind stop was secured at the head and sill using two #8 x 3" long drywall screws located 1-1/2" from each corner and then one #8 x 3" long drywall screws 8" on center. The jambs were secured using #8 x 3" long drywall screws 1-1/2" from each corner and then 8" on center.</p> <p>The interior blind stop was secured using #8 x 3" long drywall screws located 1-1/2" from each corner and then 8" on center.</p>

Tape and film were used to seal against air leakage during structural testing. In our opinion, the tape and film did not influence the results of the test.

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SECTION 5 EQUIPMENT

Canon: Constructed from steel piping utilizing compressed air to propel the missile – A1207

Missile: 2x4 Southern Pine

Timing Device: Electronic Beam Type

Cycling Mechanism: Computer controlled centrifugal blower with electronic pressure measuring device – 005644

Tape Measure Verification: 63788

SECTION 6 LIST OF OFFICIAL OBSERVERS

NAME	COMPANY
Steve Champlin	Impact Security, LLC
Timothy J. McGill	Intertek B&C
Tanya A. Dolby, P.E.	Intertek B&C
Kenneth L. Wymer	Intertek B&C

SECTION 7 TEST SPECIMEN DESCRIPTION

Product Type: Hurricane Storm Shutter

Series/Model: DefenseLite Pro

Product Size:

OVERALL AREA:	WIDTH		HEIGHT	
	millimeters	inches	millimeters	inches
2.0 m ² (22.0 ft ²)				
Overall size	1022	40-1/4"	2000	78-3/4"

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Frame Construction:

FRAME MEMBER	MATERIAL	DESCRIPTION
Head, sill, and jambs	Aluminum	Extruded

	JOINERY TYPE	DETAIL
All corners	Butted	Fastened with two #12 x 1-1/4" pan head screws through the head and sill into the jamb screw bosses and sealed with silicone.

Reinforcement: No reinforcement was utilized.

Weatherstripping: No weatherstripping was utilized.

Glazing: No conclusions of any kind regarding the adequacy or inadequacy of the glass in any glazed test specimen can be made.

GLASS TYPE	SPACER TYPE	INTERIOR LITE	EXTERIOR LITE	GLAZING METHOD
1/4" IG	Aluminum box tube	1/4" tempered glass	3/8" polycarbonate	Exterior glazed. Interior lite was glazed against a rubber gasket. The exterior lite was glazed against glazing tape on an aluminum square tube that measured 1" by 1" by 1/8" thick and secured with #11 x 1" countersunk self-drilling screw.

LOCATION	QUANTITY	DAYLIGHT OPENING		GLASS BITE
		millimeters	inches	
Centered in frame	1	876 x 1861	34-1/2 x 73-1/4	1/4"

Drainage: No drainage was utilized.

Hardware: No hardware was utilized.

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SECTION 8

TEST RESULTS

The temperature during testing was 16°C (61°F). The results are tabulated as follows:

ASTM E1886, LARGE MISSILE IMPACT

Conditioning Temperature: 16°C (61°F)

Missile Weight: 4060 g (8.95 lbs)

Missile Length: 2.5 m (8' 4")

Muzzle Distance from Test Specimen: 3.7 m (12')

Test Specimen #1: Orientation within ±5° of horizontal

IMPACT	#1	#2
MISSILE VELOCITY	24.6 m/s (80.7 fps)	24.1 m/s (79.1 fps)
IMPACT AREA	Center	Top right corner
OBSERVATIONS	Missile hit target area, interior glass shattered, no damage to polycarbonate panel.	Missile hit target area and bounced off polycarbonate panel. No further damage.
RESULTS	Pass	Pass

Note: See Intertek B&C Sketch #1 for impact locations.

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ASTM E1886, AIR PRESSURE CYCLING**Design Pressure:** ± 4405 Pa (± 92.0 psf)**Positive Pressure:**

PRESSURE RANGE Pa (psf)	NUMBER OF CYCLES	AVERAGE CYCLE TIME (seconds)	OBSERVATIONS
881 to 2202 (18.4 to 46.0)	3500	2.64	No further damage
0 to 2643 (0 to 55.2)	300	2.83	No further damage
2202 to 3524 (46.0 to 73.6)	600	2.59	No further damage
1321 to 4405 (27.6 to 92.0)	100	2.76	No further damage

Negative Pressure:

PRESSURE RANGE Pa (psf)	NUMBER OF CYCLES	AVERAGE CYCLE TIME (seconds)	OBSERVATIONS
1321 to 4405 (27.6 to 92.0)	50	2.95	No damage
2202 to 3524 (46.0 to 73.6)	1050	2.72	Stopped at 791 cycles to go. Tape and film added to interior to seal against air leakage due to the glazing deflection. No further damage.
0 to 2643 (0 to 55.2)	50	2.98	No further damage
881 to 2202 (18.4 to 46.0)	3350	2.75	No further damage

Result: Pass

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SECTION 9

CONCLUSION

This report does not constitute certification of this product nor an opinion or endorsement by this laboratory. Intertek B&C will service this report for the entire test record retention period. The test record retention period ends four years after the test date. Test records, such as detailed drawings, datasheets, representative samples of test specimens, or other pertinent project documentation, will be retained for the entire test record retention period.

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.

SECTION 10

SKETCH(ES)

REV	DATE	DESCRIPTION	BY
PROJECT NO: N2702.01 109-44		PROJECT NAME: ASTM E1886 & ASTM E 1996 CLIENT: Impact Security, LLC	
		DRAWING TITLE: SKETCH #1 - IMPACT LOCATIONS	
		DATE: 6/23/22	
		SHEET: 1 OF 1	

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SECTION 11

PHOTOGRAPHS



Photo No. 1
Test Specimen Before Cycles



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SECTION 12

DRAWING

The client did not provide accurate dimensional drawings.

SECTION 13

REVISION LOG

REVISION #	DATE	PAGES	REVISION
0	06/23/22	N/A	Original Report Issue