



HURRICANE TEST LABORATORY, LLC
TESTING AND EVALUATION SOLUTIONS
6655 Garden Rd.
Riviera Beach, FL 33404
www.htltest.com

Report #: 0470-0514-07
Specimen #s: 1, 2 & 3
Test Date: See section 5.0
Report Expires on: 8/15/12
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MANUFACTURER'S IDENTIFICATION

- 1.0 NAME OF APPLICANT:** American Hurricane Panel, Inc.
 500 Seminole Blvd. Unit A
 Largo, FL 33770
 727.394.8782
- 2.0 CONTACT PERSON:** Larry Ford
- 3.0 HTL TEST NOTIFICATION #:** HTL07033
- 4.0 HTL LAB CERTIFICATION #:** Miami-Dade County (05-1014.01); Florida Building Code (TST1527); IAS-ES (TL-244); AAMA; WDMA; Keystone Certifications; Texas Department of Insurance
- 5.0 REPORT INFORMATION:**

Report #	Specimen #	Test Dates
0470-0514-07	1	5/8/07 – 5/10/07
	2	5/8/07 – 5/9/07
	3	5/8/07 – 5/10/07

PRODUCT IDENTIFICATION

- 6.0 Product Type:** Plywood Attachment System
- 7.0 Model:** Eagle Clamp
- 8.0 Performance Class:** +/-50 psf
- 9.0 Overall Size:** 99.50" (w) x 51.63" (h)
- 10.0 Drawing:** This report is incomplete if not accompanied by the drawings listed in the below table bearing the raised seal of Hurricane Test Laboratory, LLC.

Manufacturer	Drawing #	Sheets
American Hurricane Panels	sk-4-11-07-03	1 sheet
American Hurricane Panels	sk-4-11-07	1 sheet
American Hurricane Panels	sk-4-11-07-01	1 sheet
American Hurricane Panels	062306-1	1 sheet
American Hurricane Panels	sk-4-11-07-02	1 sheet
American Hurricane Panels	sk-4-12-07-02	1 sheet
American Hurricane Panels	sk-7907-1	1 sheet
American Hurricane Panels	sk-71307-1	1 sheet

- 11.0 Sample Source:** Samples provided by American Hurricane Panel, Inc.

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FL Reg. #53280
8/16/2007



PRODUCT DESCRIPTION

12.0 Frame Construction: The test panel frame was fabricated using the following wood components:

Name	Size	Material
Surround Frame	2.000" x 6.000"	Wood
Inside Frame	2.000" x 2.000"	Wood
Corner Brace	22.000" x 22.000" x 0.750" (thick)	Wood

The following procedures (typical) were utilized when assembling the test panel frame:

Surround Frame Corner Construction: At each corner, the adjacent surround frame members were square cut, butted and mechanically attached using four (4), #8 x 3" coarse thread drywall screws.

Inside Frame: Each inside frame member end was square cut and the member was mechanically attached to the surround frame using six (6), #8 x 3" coarse thread drywall screws spaced 6" from each end and evenly spaced thereafter.

Corner Brace: Each corner brace was mechanically attached to the inside frame using three (3), #8 x 1-5/8" coarse thread drywall screws per side. The fasteners were spaced 6" from the corner and 6" on center thereafter.

13.0 Clamp Assembly & Test Panel: The clamp assembly and test panel were made up of the following materials:

Name	Overall Cross Section	Material
Eagle Clamp Front	1.272" x 0.910" x 2.125"	LEXAN® 141
Eagle Clamp Back	1.750" x 1.470" x 2.125"	LEXAN® 141
Test Panel	48.000" x 96.000" x 0.750"	Plywood

Clamp Assembly: The clamp front was secured to the clamp back using two (2), 8-32 x 1/2" SS screws with matching brass inserts.

INSTALLATION

14.0 This sample was installed into the wood surround frame as follows:

Location	Fastener Description	Schedule
Top & Bottom	One (1) eagle clamp pin passed through each clamp assembly into a 0.44" diameter LDPE sleeve located on the surround frame.	6" from each panel edge and 12" on center thereafter
Sides		6" from each panel edge and 24" (maximum) on center thereafter
Plywood to Clamp	The plywood was attached at each clamp location using one (1), 1/4-20 x 1-1/2" SS bolt with matching nut	N/A

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TEST RESULTS

15.0 SUMMARY OF RESULTS:

Test Method	Test Conditions	Passed Specimen #s
Static Load Test (ASTM E330 and TAS 202)	+/- 50 psf Design Pressure	3
Large Missile Impact Test (ASTM E1886/E1996 and TAS 201)	--	1, 2 & 3
Cyclic Load Test (ASTM E1886/E1996 and TAS 203)	+/- 50 psf Design Pressure	1, 2 & 3

16.0 TEST SEQUENCE:

Specimens #1 & #2:

- a. Uniform static load test at positive pre load
- b. Uniform static load test at positive design pressure
- c. Uniform static load test at positive over load
- d. Uniform static load test at negative pre load
- e. Uniform static load test at negative design load
- f. Uniform static load test at negative over load
- g. Large missile impact test
- h. Positive cyclic load test
- i. Negative cyclic load test
- j. Positive cyclic load test
- k. Negative cyclic load test

Specimen #3:

- a. Large missile impact test
- b. Positive cyclic load test
- c. Negative cyclic load test
- d. Positive cyclic load test
- e. Negative cyclic load test

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17.0 UNIFORM STATIC LOAD TEST RESULTS:

17.1 DEFLECTION DATA:

17.1.1 POSITIVE LOADS:

Geometric Center of Plywood (Center Panel)					
Specimen #	Pressure (psf)	Time (sec.)	Net Deflection (in.)	Permanent Set (in.)	% Recovery
3	37.5	33	0.900	0.019	97.89
	50.0	33	1.105	0.026	97.65
	75.0	30	1.480	0.038	97.43

17.1.2 NEGATIVE LOADS:

Geometric Center of Plywood (Center Panel)					
Specimen #	Pressure (psf)	Time (sec.)	Net Deflection (in.)	Permanent Set (in.)	% Recovery
3	37.5	33	0.897	0.045	94.98
	50.0	33	1.158	0.076	93.44
	75.0	30	1.566	0.094	94.00

17.3 REMARKS:

No signs of failure were found in any area of this test specimen during the uniform static load test. As such, this specimen was found to satisfy the uniform static load test requirements of ASTM E330 and TAS 202.

18.0 MISSILE IMPACT TEST RESULTS:

18.1 IMPACT DATA:

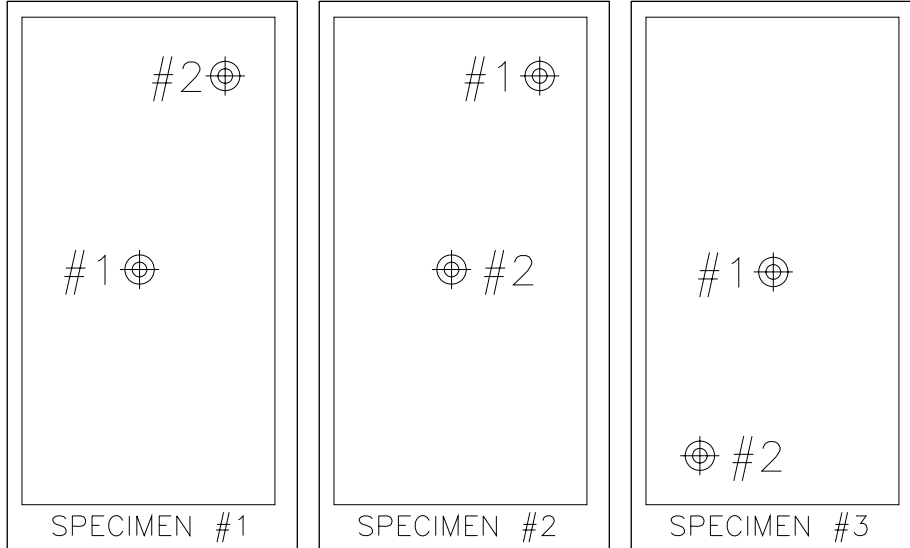
Impact #	Type of Missile	Missile Weight	Missile Length (in.)	Velocity (ft/s)	X Coordinate (in.)	Y Coordinate (in.)
Specimen #1						
1	LARGE	8 lb.	92.00	48.40	24.00	48.00
2		14 oz.		50.03	41.50	87.50
Specimen #2						
1	LARGE	8 lb.	92.00	48.78	42.00	87.50
2		14 oz.		50.13	24.00	48.00
Specimen #3						
1	LARGE	8 lb.	92.00	48.76	26.00	47.50
2		14 oz.		49.02	11.00	10.00

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18.2 IMPACT LOCATIONS:



18.3 REMARKS:

Each impact test conducted on these specimens was performed in accordance with the requirements of ASTM E1886/E1996 and TAS 201. All of the impacts hit their intended targets resulting in the recorded measurements. Upon completion of the missile impact tests, these specimens subsequently underwent the cyclic load test as specified by ASTM E1886/E1996 and TAS 203.

19.0 CYCLIC LOAD TEST RESULTS (ASTM E1886/E1996):

19.1 TEST PRESSURE:

Specimens #1, 2 & 3	
$(P_d)_{in} = P_{max}$	$(P_d)_{out} = P_{max}$
50 psf	50 psf

19.2 TEST SPECTRUM:

19.2.1 POSITIVE:

# OF INWARD ACTING CYCLES/STAGE			
10 – 25 (psf)	0 – 30 (psf)	25 – 40 (psf)	15 – 50 (psf)
3500	300	600	100

19.2.2 NEGATIVE:

# OF OUTWARD ACTING CYCLES/STAGE			
15 – 50 (psf)	25 – 40 (psf)	0 – 30 (psf)	10 – 25 (psf)
50	1050	50	3350

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19.3 DEFLECTION DATA:

Specimen #	Geometric Center of Plywood (Center Panel)					
	INWARD (POSITIVE) LOAD			OUTWARD (NEGATIVE) LOAD		
	Net Deflection (in.)	Permanent Set (in.)	% Recovery	Net Deflection (in.)	Permanent Set (in.)	% Recovery
1	1.100	0.100	90.91	1.100	0.150	86.36
2	0.700	0.100	85.71	1.200	0.300	75.00
3	1.275	0.100	92.16	1.300	0.100	92.31

19.4 REMARKS:

These specimens were inspected carefully upon completion of the cyclic test for failures. None were found. As such, these specimens were found to satisfy the cyclic test requirements of ASTM E1886/E1996.

20.0 CYCLIC LOAD TEST RESULTS (TAS 203):

20.1 TEST PRESSURE:

Specimens #1, 2 & 3	
$(P_d)_{in} = P_{max}$	$(P_d)_{out} = P_{max}$
50 psf	50 psf

20.2 TEST SPECTRUM:

20.2.1 POSITIVE:

# OF INWARD ACTING CYCLES/STAGE		
0 – 25 (psf)	0 – 30 (psf)	0 – 65 (psf)
600	70	1

20.2.2 NEGATIVE:

# OF INWARD ACTING CYCLES/STAGE		
0 – 25 (psf)	0 – 30 (psf)	0 – 65 (psf)
600	70	1

20.3 DEFLECTION DATA:

Specimen #	Geometric Center of Plywood (Center Panel)					
	INWARD (POSITIVE) LOAD			OUTWARD (NEGATIVE) LOAD		
	Net Deflection (in.)	Permanent Set (in.)	% Recovery	Net Deflection (in.)	Permanent Set (in.)	% Recovery
1	1.175	0.000	100.00	1.750	0.030	98.29
2	1.200	0.000	100.00	1.600	0.100	93.75
3	1.500	0.000	100.00	1.400	0.000	100.00

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20.4 REMARKS:

These specimens were inspected carefully upon completion of the cyclic test for failures. None were found. As such, these specimens were found to satisfy the cyclic test requirements of TAS 203.

MISCELLANEOUS INFORMATION

21.0 CERTIFICATION & DISCLAIMER STATEMENT:

All tests performed on this test specimen were conducted in accordance with the specifications of the applicable codes, standards & test methods listed below by the Hurricane Test Laboratory, LLC located at 6655 Garden Road, Riviera Beach, FL 33404. HTL does not have, nor does it intend to acquire or will it acquire, a financial interest in any company manufacturing or distributing products tested at HTL. HTL is not owned, operated or controlled by any company manufacturing or distributing products it tests. This report is only intended for the use of the entity named in section 1.0 of this report. Detailed assembly drawings showing wall thickness of all members, corner construction and hardware applications are on file and have been compared to the test specimen submitted. A copy of this test report along with representative sections of the test specimen will be retained at HTL for a period of three (3) years. All results obtained apply only to the specimen tested and they do indicate compliance with the performance requirements of the test methods and specifications listed in the following section.

22.0 APPLICABLE CODES, STANDARDS & TEST METHODS:

ASTM E330-02 - Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.

Florida Building Code (HVHZ) Test Protocol TAS 202-94 – Criteria For Testing Impact and Non-Impact Resistant Building Envelope Components Using Uniform Static Air Pressure.

ASTM E1886-05 – Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors and Storm Shutters Impacted by Missiles and Exposed to Cyclic Pressure Differentials.

ASTM E1996-05 – Standard Specification for Performance of Exterior Walls, Glazed Curtain Walls, Doors, and Storm Shutters Impacted by Windborne Debris in Hurricanes.

Florida Building Code (HVHZ) Test Protocol TAS 201-94 – Impact Test Procedures.

Florida Building Code (HVHZ) Test Protocol TAS 203-94 – Criteria For Testing Products Subject To Cyclic Wind Pressure Loading.

23.0 LIST OF OFFICIAL OBSERVERS:

Vinu J. Abraham, P.E. – HTL, Managing Partner
Urmilla Jokhu-Sowell, P.E. – HTL, Assistant Operations Manager
John Spallina – HTL, Technician
Eric Reyes – HTL, Technician
Veron Wickham – HTL, Technician

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