

HURRICANE ENGINEERING & TESTING INC.

Computer Controlled Product Testing & Design,
.....Wind Load Analysis

Large Missile Impact & Cyclic Wind Pressure Tests (TAS 201 & TAS 203, ASTM E-1886 & ASTM E-1996) (Miami Dade Protocol PA 201 & PA 203-94)

January 13, 2004.

REPORT NUMBER: **HETI-03-1885A**

MANUFACTURER: Wayne-Dalton Corporation.
3395 Addison Dr., Pensacola, FL 32514.

TEST LOCATION: Hurricane Engineering & Testing Inc.
6120 NW 97 AVE, Miami, FL 33178.

SBCCI LISTING No.: TL - 9596B.

LAB. CERT. NUMBER: 02-0415.01 (MIAMI-DADE COUNTY).

PRODUCT: Fabric Shield™ Storm Panel

PRODUCT DESCRIPTION: 0.037" thick PVC Coated Woven Polyester fabric.
(Reference Tensile Test Reports: HETI-04-T107, & HETI-04-T108).

PRODUCT SIZE: 63" w x 110 7/8" h

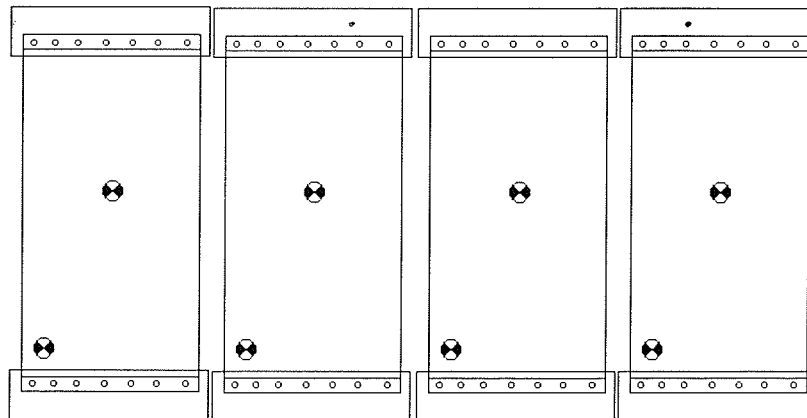
DESIGN LOADS (psf): **+62, -66**

DRAWING NUMBER: EX-04002, EX-04003, 01/09/2004, EX-03086 dated 02/17/03, and
EX-03125 dated 03/27/2003, EX02628 dated 11/05/03 by Wayne-Dalton Corporation

NOTE: *HETI stamped drawing is an integral part of this report.*

TEST WITNESSED BY: Syed Waqar Ali, Ph. D. (HETI)
Dr. Nasreen K. Ali, E.I. (HETI)

WITNESSING ENGINEER: Mr. Rafael E. Droz-Seda, P.E. (HETI)



⊗ Impact Locations

Handwritten signature and date: 2/1/04

Construction Details

PRODUCT Fabric Shield™ Storm Panel

PRODUCT SIZE 63" w x 110 7/8" h

Opening Size 62 7/8" x 106 1/4" h

Fabric Material

A 0.037" PVC coated woven polyester fabric.

Storm Panel Construction

A piece of PVC coated woven polyester fabric were cut to 63" w x 119 3/8" h. The edge was folded twice creating a 3X fold and welded to create 63" x 110 7/8" panel. The finished edge on top and bottom was 2 1/8" wide.

Grommets

(7) 1/2" hole size x 1.05" flange DIA X 0.017" thick brass, trade size#4 grommet and grommet washer installed @12" O.C and at 1 7/16" from vertical edge along the top and (7) along the bottom of the fabric. The center of the grommets was 1 3/8" from edge of the fabric.

INSTALLATION

Sample I-IV

Location	Substrate	Fastener Type	Spacing	Quantity
Bottom	Grout Filled Blocks	1/4" x 1/2" SS Side Walk Bolt & 1/4 x 1 3/4" ELCO PANELMATE (female)	1 7/16" from end and 12" O.C. 2 1/4" from edge of substrate	Seven
Top	Hollow Blocks	1/4" x 2" (3.44" overall) Elco PANELMATE plus (male) with 0.854" diameter Washer Wing Nut	1 7/16" from end and 12" O.C. 2 1/4" from edge of substrate	Seven

Test Results

Large Missile Impact Test

Impact Location	Speed (fps)	Observations
Sample I		
1) center	50	No penetration or rupture.
2) corner	50	No penetration or rupture.
Sample II		
1) center	50	No penetration or rupture.
2) corner	50	No penetration or rupture.
Sample III		
1) center	50	No penetration or rupture.
2) corner	50	No penetration or rupture.
Sample IV		
1) center	50	No penetration or rupture.
2) corner	50	No penetration or rupture.

The samples were impacted with a #2 Southern Yellow Pine S4S, 2 x 4 missile, 9 lbs 96" long. Maximum deflection due to impact was 8 5/8".

WJA
3/11/04

Cyclic Wind Pressure Test Results

Sample I

Cycles	Pressure (psf)	Deflection (in)	Set (in)	Recovery (%)	Duration (sec)
Positive Pressure Cycles					
3500	+31	----	----	----	1
300	+37	----	----	----	1
600	+50	----	----	----	1
100	+62	----	----	----	1
Negative Pressure Cycles					
50	-66	----	----	----	1
1050	-53	----	----	----	1
50	-40	----	----	----	1
3350	-33	----	----	----	1

Sample II

Cycles	Pressure (psf)	Deflection (in)	Set (in)	Recovery (%)	Duration (sec)
Positive Pressure Cycles					
3500	+31	----	----	----	1
300	+37	----	----	----	1
600	+50	----	----	----	1
100	+62	----	----	----	1
Negative Pressure Cycles					
50	-66	----	----	----	1
1050	-53	----	----	----	1
50	-40	----	----	----	1
3350	-33	----	----	----	1

Sample III

Cycles	Pressure (psf)	Deflection (in)	Set (in)	Recovery (%)	Duration (sec)
Positive Pressure Cycles					
3500	+31	----	----	----	1
300	+37	----	----	----	1
600	+50	----	----	----	1
100	+62	----	----	----	1
Negative Pressure Cycles					
50	-66	----	----	----	1
1050	-53	----	----	----	1
50	-40	----	----	----	1
3350	-33	----	----	----	1

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Sample IV

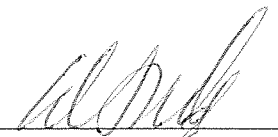
Cycles	Pressure (psf)	Deflection (in)	Set (in)	Recovery (%)	Duration (sec)
Positive Pressure Cycles					
3500	+31	----	----	----	1
300	+37	----	----	----	1
600	+50	----	----	----	1
100	+62	----	----	----	1
Negative Pressure Cycles					
50	-66	----	----	----	1
1050	-53	----	----	----	1
50	-40	----	----	----	1
3350	-33	----	----	----	1

Conclusion

The sample was tested and passed in accordance with Test Application Standard (TAS), TAS 201-94 and TAS 203-94 of the Florida Building Code & ASTM E 1886 & ASTM E 1996 and Miami Dade County Protocol PA 201-94 & PA 203-94. The samples were intact; operable/removable and all parts were securely in place at the conclusion of each test.

NOTE: The above results were obtained using the designated test methods, which indicates compliance with the performance requirements of the referenced specifications. This report does not constitute certification of the specimens tested.

Syed Waqar Ali, Ph. D.
President



Rafael E. Droz-Seda, P.E.
Resident Engineer

3/11/04