PRODUCT EVALUATION REPORT

1. Application Number: FL 8363

2. Date: February 20, 2012

3. Product Category: Hurricane Shutters/ Wind Abatement Systems

4. Product Sub-Category: New/ Innovative Envelope Products

5. Product Name: Armor Screen Grommet and Hemcord Series 2000 w/ pneumatic device

6. Evaluation Entity: Gary D Foreman PE, SE, AIA, PA
1239 McGregor Woods Circle
Fort Myers, Florida 33908
(239) 989-3887

7. Manufacturer: Armor Screen Corporation
1881 Old Okeechobee Road
West Palm Beach, Florida 33409
(561) 841-8890

8. Product Description: A flexible wind abatement and impact protection system. The system is anchored through grommets fabricated into the edges of the panel or via a sewn in hemchord that fits into proprietary aluminum ‘F’ or ‘C’ channels attached to structure at the edge of the opening. This system may be used for new or existing construction or for replacement of traditional hurricane protection.

9. Statement of Compliance: This product evaluation report is issued by Gary D Foreman PE, SE, AIA PA to Armor Screen Corporation in accordance with Section 9B-72.070 Method 1D, F.A.C. Department of Community Affairs, Florida Building Commission. The product covered by this report has been verified to be in compliance with the Florida Building Code, 2010 Edition and ASCE / SEI 7-10

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10. Evidence Submitted per Subsection 9B-72.070(4)(a-h)
   a. Sections 6 and 7 of this report.
   b. Section 9 of this report.
   c. Section 8 of this report.
   d. Testing Reports:

11. Fenestration Testing Laboratory, Inc.
    8148 N.W. 74th Avenue
    Medley, FL 33166
    File #: 07-482
    Lab #: 5174
    Report #: 01
    Test sample 12'-4" x 6'-6" geotextile fabric storm protection screen with grommets
    for impact and static air pressure per Sections 1619 and 1620 of the Florida Building
    Code and Test Protocol TAS 201, TAS 202, and TAS 203. Tests per ASTM E330,
    1996-05 and 1886-05. The test panel was attached, on one side, to a solid
    grouted CMU jamb via a series of fasteners spaced at 6 1/2" o.c. made up of 1/4"
    diameter machine screws with a washer or truss head machine bolt into hollow set
    drop in anchors, drop in anchors, and caulk in anchors, plus 1/4" diameter
    female panelmate screws, and 1/4" diameter male panelmate with wing nut anchors.
    On the other jamb, the anchors were attached into hollow CMU via 1/4" diameter
    machine screws with washers into hollow set drop in anchors plus 1/4" diameter
    tapcon screws and male panelmate screws with wingnut. All anchors were
    spaced at 6 1/2" o.c.

12. Fenestration Testing Laboratory, Inc.
    8148 N.W. 74th Avenue
    Medley, FL 33166
    File #: 07-482
    Lab #: 5180
    Report #: 02
    Test sample 12'-4" x 6'-6" geotextile fabric storm protection screen with hemcord
    in proprietary 10" long aluminum C channel segments for impact and static air
    pressure per Section 1619 and 1620 of the Florida Building Code and Test Protocol
    TAS 201, TAS 202, and TAS 203. Tests per ASTM E330, 1996-05 and
    1886-05. The aluminum proprietary C channels at the ends were attached, on one
    side to a solid grouted CMU jamb via a series of fasteners spaced at 6 1/2" o.c. made
    up of 1/4" diameter machine screws with a washer into hollow set drop in anchors

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   And caulk in anchors, plus ¼” diameter tapcons, and ¼” diameter mushroom head
   spike anchors. On the other jamb, the anchors were attached into hollow CMU via
   ¼” diameter machine screws with washers into several hollow set drop in anchors
   and ¼” diameter tapcon screws spaced at 6 ½” o.c.

13. Fenestration Testing Laboratory. Inc.
   8148 NW 74th Avenue
   Medley, FL 33166
   File #: 07-482
   Lab #: 5279
   Report #: 03
   Report Date: 8/25/07
   Five test samples 16’-1 ½” x 16’-3 ½” geotextile fabric storm protection screen with
   2” wide reinforced band at perimeter and a 20” diameter separate 20” diameter
   pneumatic device inflated to 3 psi. at each side of the screen between the screen and
   test frame. Four samples were tested for impact and static air pressure per Sections
   1619 and 1620 of the Florida Building Code and Test Protocol TAS 201, TAS 202,
   and TAS 203. Tests per ASTM E330, 1996-05 and 1886-05. The screen
   was attached at the left side to the 2x12 treated wood buck via 3/8” diameter by 2”
   long lag screws at 24” o.c. and key hole clips attached to straps fabricated into the
   screen. The right side was a hemchord sewn into the screen attached into a
   continuous aluminum track fastened at 24” o.c. to hollow CMU via 3/8” diameter
   machine screws into drop in anchors and 3/8” sidewalk bolts. On one sample the left
   side was attached to the 2x12 wood buck with a hemchord into an aluminum track.
   The track was attached to the wood buck via 3/8” by 2 ½” lag screws at 24” o.c.
   The right side was attached to the hollow CMU jamb via 3/8” diameter machine
   bolts into drop in anchors and 3/8” diameter sidewalk bolts at 24” o.c.

14. Fenestration Testing Laboratory. Inc.
   8148 NW 74th Avenue
   Medley, FL 33166
   File #: 07-48
   Lab #: 5446
   Report #: 04
   Report Date: 12/07/2007

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Five test samples 16'–6 ½” x 6’-0” geotextile fabric storm protection screen with 2” wide reinforced band at perimeter. Three samples were tested for impact and static air pressure per Sections 1619 and 1620 of the Florida Building Code and Test Protocol TAS 201, TAS 202, and TAS 203. Tests per ASTM E330, 1996-05 and 1886-05. The screen was attached at the left side to the solid grouted CMU via 3/8” diameter wedge bolts and mushroom spikes at 24” o.c. attaching 4 7/8” long C tracks holding straps with a proprietary buckle fabricated into the screen. The right side was a hemchord sewn into the screen attached into a continuous aluminum track fastened at 24” o.c. to a 4x4 wood buck with 3/8” x 4” lag screws.

15. Fenestration Testing Laboratory, Inc.
8148 NW 74th Avenue
Medley, FL 33166
File: # 08-482
Lab: # 5533
Report #: 01
Report Date: 2-10-08
Five samples 12’-4” wide by 6’-3” high geotextile fabric storm protection screen with 4 1/2” wide reinforced band at each side and 2” wide band at top and bottom edges. One 20” pneumatic device, inflated to 2 psi, was installed between the screen and a non-impact, glazed window. The device was positioned over the mullion at the center of the opening, with a 1” separation, for tests A-1, A4 and A-5. A 2” x 6” x 1/8” aluminum tube 8’-0” long storm bar was installed between the screen and window for impact test A-2. In test A-3, a 2” x 6” x ¾” storm bar 12’-0” long was installed between the screen and window. The window and glazing were undamaged at the conclusion of the impact tests. Screen deflections under positive pressure were found to be comparable to deflections expected for a 6’-0” screen span, confirming the storm bars and pneumatic device as effective in reducing the separations required for large openings. The pneumatic device deflected ½” into the 1” gap on the side adjacent to the window, therefore did not transfer load to the window. The left side of the screen was attached to grouted solid CMU via ¾” diameter sidewalk bolts through the grommets into anchor inserts at 18” o.c. The right side was attached to an 18 gage metal stud via No. 14 x14 self drilling screws at 6” o.c. through an aluminum F track and into the metal stud. The screen was attached to the F track via grommets at 18” o.c.

[Signature]
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16. Fenestration Testing Laboratory, Inc.
8148 NW 74th Avenue
Medley, FL 33166
File: # 08-482
Lab: # 5604
Report #: 02
Report Date: 4-4-08
A 20” diameter by 72” pneumatic device inflated to 2 psi was impact tested to
measure the force transferred to a structural member in contact with the back of the .
device. Two tests were performed with large missiles at 50.2 and 50.7 ft/sec. and .
force readings taken digitally. Impact was not transferred through the device. The
force on the back side of the device was measured ranging between 162.5 pounds
and 167.0 pounds with missiles striking the center of the opposite face. The
instructions note that for the device to be used in contact with the structure, the
structure, mullion, or framing element in contact with the device shall be designed to
withstand a force of 250 pounds (maximum measured test force with a 1.5 safety
factor)

17. As per ASTM standards cited, the system has been tested to pressures in excess of
rated maximum pressure and span without failure of the system. The tables included
in the Installation Instructions have been determined via rational analysis using a
variety of spans and pressures up to the rated capacity. The various tables provide
fastener options and spacing for typical spans, pressures and types of structure to
anchor to. Earlier tests were performed with fasteners spaced at 6 1/2”, 18” and 24”.
The most recent tests were performed with 3/8” diameter fasteners spaced at 24”.
The tables provide various spacing and fastener choices as would be performed for
site specific analysis within the tested parameters.

18. The system is not for use in the HVHZ. Outside of the HVHZ, the offset is not
required. However, to prevent damage to the glazing, the fabric shall be
installed with the fabric sufficiently offset from existing glazing to allow for the
deflection listed for the specific span and wind pressures in Table D1.1. The required
offset may be accomplished as noted in the various details in the Installation
Instructions including the use of storm bars (Page 11), Pneumatic Deflection System
(page 12) or Center Hem Deflection System (Page 13).

19. The storm bars and pneumatic device have been tested for wind pressure and impact
in lab #5533 Test 01 dated 2-08-08.

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20. The Center Hem Deflection System has been engineered by rational analysis for listed wind pressures and may be installed to provide separation for the fabric from the window glazing.

21. Tests have used a variety of fastener spacing from 6” to 24” o.c. into a variety of substrata including, wood (SYP or Douglas Fir), 18 gage metal studs w/ sheathing, and grouted CMU. The instructions include a variety of tables indicating the fastener spacing based upon testing results and rational analysis for pressures, strata, spans, and fastener type up to the test supported criteria.

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