



Product Evaluation Report

Date:	May 31, 2023
Code:	Current Edition of the Florida Building Code including 8 th Edition (2023) FBC
Report #:	2108-PER
Report Revision No.:	4
Project #:	422-0613
Product Mfg.:	Storm Depot of America, Inc. DBA Storm Busters® 720 N. Harbor City Blvd. Melbourne, FL 32925
Product Description:	16MM Clearview® Polycarbonate Storm Panels – HVHZ and Non-HVHZ
Product Category:	Shutters
Product Sub-Category:	Storm Panels
Compliance Method:	Product Approval Rule 61G20-3.005(1)(d) – Product Evaluation Report by a Licensed Professional Engineer
Prepared By:	Robert J. Amoruso, P.E. Florida P.E. No. 49752 PTC Product Design Group, LLC, PO Box 520775, Longwood, FL 32752-0775 Florida C of A No. 25935

CERTIFICATE OF INDEPENDENCE

PTC Product Design Group, LLC and Robert J. Amoruso, P.E. do not have, nor will acquire, any financial interest in the company manufacturing or distributing product(s) covered by this Product Evaluation Report. PTC Product Design Group, LLC and Robert J. Amoruso, P.E. do not have, nor will acquire any financial interest in any other entity involved in the approval process or testing of the product(s) covered by this Product Evaluation Report.

Evaluated by:
Robert J. Amoruso, P.E.
FL PE License No. 49752



SCOPE

Evaluate Storm Depot of America, Inc. DBA Storm Busters® 16MM Clearview® Polycarbonate Storm Panels for conformance to the current edition of the Florida Building Code – Building and Residential Volumes for the following:

- Drawing No. STB0022 for use in Wind Borne Debris Regions **excluding** the High Velocity Hurricane Zone (HVHZ)
- Drawing No. STB0013 for use in Wind Borne Debris Regions **including** the High Velocity Hurricane Zone (HVHZ)

The engineering analysis (Reference 3) determines the anchorage of the product to the supporting substrate and the product evaluation report (this document) summarizes FBC compliance verification and appropriate Limitations and Conditions of Use.

DESCRIPTION OF PRODUCT – INSTALLATION REQUIREMENTS

See Reference 1 for a description of the product, its installation and other pertinent data related to its approved use.

LIMITATIONS AND CONDITIONS OF USE

This product evaluation report contains or makes reference to specifications, technical details and installation details and/or methods that pertain to the proper use and/or installation of the product specified herein. Specific limitations and conditions of its use including but not limited to the following are contained in Reference 1 and are the subject of Product Approval in accordance with the State of Florida Product Approval Rule 61G20-3.

- Design Pressure Rating (psf)
- Installation substrate requirements.
- Installation anchor requirements.
- Installation restrictions.
- Product description.
- Product components.

PERFORMANCE AND TESTING STANDARDS

Reference 2.a conducted testing to the following standards. See Reference 3.d for equivalency evaluation of structural testing standards.

1. ASTM E330-02, Standard Test Method for Structural Performance of Exterior windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
2. ASTM E1886-02, 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.



3. ASTM E1996-02, Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes.

Reference 2.b conducted testing to the following standards. See Reference 3.d for equivalency evaluation of structural testing standards.

1. TAS201-94, Impact Test Procedures.
2. TAS202-94, Criteria for Testing Impact & Non-Impact Resistant Building Envelope Components Using Uniform Static Air Pressure.
3. TAS203-94, Criteria for Testing Products Subjected to Cyclic Wind Pressure Loading.

CODE CONFORMANCE STRUCTURAL PERFORMANCE, IMPACT & CYCLIC LOADING

DESIGN PRESSURE LIMITATIONS

- Design Pressure is based on the following requirements:
 - Chapter 6, Florida Residential Code
 - Tested at 1.5 x Design Pressure
 - Chapter 16 Florida Building Code
 - Tested at 1.5 x Design Pressure
- Testing documented in Reference 2.a and 2.b test reports was based on:
 - Static Wind Loading testing to 1.5 x Design Pressure.
 - Post-Impact Cyclic Wind Loading testing to the Design Pressure.
 - The Design Pressure limitations shown on the Installation Anchorage Details (Reference 1.a and 1.b) are based on the Design Pressure results.

CODE CONFORMANCE - LABELING

Labeling shall be in compliance with the requirements of the current edition of the Florida Building Code. See Reference 4.

CODE CONFORMANCE - INSTALLATION

Installation shall be as shown on the Installation Drawing (Reference 1.a and 1.b) in compliance with the requirements of the current edition of the Florida Building Code – Building and Residential Volumes. See Reference 4.



MATERIAL CERTIFICATION TESTING

Polycarbonate storm panel identified as Item No. 1 in the drawing Bill of Materials (STB0013 and STB0022) is manufacturer by Brett Martin LTD as Marlon ST Longlife Multiwall Polycarbonate Panel. The specific product used is a triple wall 16mm thick polycarbonate material. See Reference 3.d for equivalency evaluation of material testing standards.

The Polycarbonate has undergone material testing as follows:

- ATI Test Report Number ATI 67803.01-106-18, dated 11/28/2006
 - ASTM D638-03 Testing
 - Tensile Strength, UV Side = 8533 psi (average result)
 - Tensile Strength, Non-UV Side = 8621 psi (average result)
 - ASTM D1929-96 (Reapproved 2001)e1
 - Self-Ignition Temperature > 500°C which equates to 982°F
 - Flash-Ignition Temperature = 459°C which equates to 858°F
 - ASTM D2843-99 (Reapproved 2004)e1
 - Smoke Density Rating = 53.1
 - ASTM D635-03
 - Linear Rate of Burn – Class C1 rating.
- PRI Construction Materials Test Report Number BML-001-02-01, dated July 23, 2007
 - TAS 110-2000 accelerated weathering testing using the following:
 - ASTM G26-96 (withdrawn in 2000 and replaced by ASTM G155)
 - ASTM G155-00a, 04a, 05
 - MD Checklist Number 0445 plastics approval using the following:
 - ASTM D638 (revision not recorded in report)
 - ASTM G26-96 (withdrawn in 2000 and replaced by ASTM G155)
 - ASTM G155-00a, 04a, 05
 - Tensile Strength change due to weathering test:
 - Before testing – mean = 8730 psi
 - After testing – mean = 9223 psi
 - The percent change in strength = 5.6%

The current edition of the FBC, Section 2606.4 requires the following for Light-Transmitting Plastics for HVHZ and non-HVHZ areas.

- Self-Ignition Temperature of 650°F (343°C) or greater tested in accordance with ASTM D1929.
 - >500°C per Reference 2.c.ii
- Smoke Density Rating not greater than 75 when tested in accordance with ASTM D2843.
 - 53.1 per Reference 2.c.i
- Combustibility classification of CC1 or CC2 when tested in accordance with ASTM D635.
 - CC1 per Reference 2.c.i



Though not specifically required in non-HVHZ areas by the FBC, Tensile Strength change due to UV exposure (accelerated weathering) was determined. A maximum 10% change is allowed in Chapter 19 of the current edition of the FBC Code, Chapter 26 for the HVHZ.

Based on a review of the test results, it is determined that the material certification requirements of the Florida Building Code have been met.

REFERENCES & SUPPORTING DOCUMENTS

1. Drawings:

- a. STB0022, Rev. B, dated October 1, 2015, signed and sealed by Robert J. Amoruso, Storm Depot of America, Inc. DBA Storm Busters® 16MM Clearview® Polycarbonate Storm Panels for Non-HVHZ – Installation Anchorage Details
- b. STB0013, Rev. C, dated October 1, 2015, signed and sealed by Robert J. Amoruso, Storm Depot of America, Inc. DBA Storm Busters® 16MM Clearview® Polycarbonate Storm Panel for HVHZ – Installation Anchorage Details

2. Test Reports:

- a. Testing by Certified Testing Laboratories for non-HVHZ to ASTM E330-02, ASTM E1886-02 and ASTM E1996-02 – applicable to Drawing No. STB0022
 - i. CTLA-1570W-1, dated September 11, 2006
 - ii. CTLA-1632W, dated February 9, 2007
 - iii. CTLA-1632W-1, dated February 9, 2007
 - iv. Revisions to CTLA-1632W and CTLA-1632W-1, dated March 12, 2007
- b. Testing by Certified Testing Laboratories for HVHZ to TAS 201-94, TAS 202-94 (Structural Loads only) and TAS 203-94
 - i. CTLA-1570W, dated 9/11/2006, signed and sealed by Ramesh Patel, FL PE License No. 20224 on 9/14/06 – applicable to Drawing No. STB0013
- c. Brett Martin Ltd. Marlon ST Longlife 16mm Triplewall Polycarbonate Sheet Material testing to the following – applicable to Drawing No. STB0013 and STB0022
 - i. ATI Test Report Number ATI 67803.01-106-18, dated 11/28/2006
 1. ASTM D638-03 Testing
 2. ASTM D1929-96 (Reapproved 2001e1)
 3. ASTM D2843-99 (Reapproved 2004e1)
 4. ASTM D635-03
 - ii. PRI Construction Materials Test Report Number BML-001-02-01, dated July 23, 2007
 1. ASTM D638 (revision not recorded in report)
 2. ASTM G26-96 (withdrawn in 2000 and replaced by ASTM G155)
 3. ASTM G155-00a, 04a, 05

3. Calculations and Reports

- a. PTC Report No. 1310, Rev. 2, Anchorage Engineering for Storm Depot of America, INC. DBA Storm Busters® 16MM Clearview® Polycarbonate Storm Panels – 96” x 80” and 96” x 48”, signed and sealed by Robert J. Amoruso, P.E.



- b. PTC Report No. 1311, Rev. 2, Anchorage Engineering for Storm Depot of America, INC. DBA Storm Busters® 16MM Clearview® Polycarbonate Storm Panels – 75” x 66”, signed and sealed by Robert J. Amoruso, P.E.
 - c. PTC PDG Report No. 645, Rev. 1, Anchorage Engineering for Storm Depot of America, INC. DBA Storm Busters® 16MM Clearview® Polycarbonate Storm Panels – HVHZ – 48” x 96”, signed and sealed by Robert J. Amoruso, P.E.
 - d. PTC Report No. 2108-EER, Rev. 4, Testing Standards Equivalency Evaluation Report for Storm Depot of America, Inc. DBA Storm Busters® 16MM Clearview® Polycarbonate Storm Panels for conformance to the current edition of the Florida Building Code – Building and Residential Volumes, signed and sealed by Robert J. Amoruso.
4. Current Edition of the Florida Building Code & Current Edition of the Florida Residential Code.
- a. 8th Edition (2023) Florida Building Code
 - b. 8th Edition (2023) Florida Residential Code