TILTECO INC.
TILLIT TESTING & ENGINEERING COMPANY

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FL P.E. License No. 44167
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PRODUCT EVALUATION REPORT

REPORT NO.:	11-1206.03
DATE:	December 6, 2011
PRODUCT CATEGORY:	Hurricane Shutters
PRODUCT SUB-CATEGORY:	Accordions
PRODUCT NAME:	Bertha H.V. Accordion Shutter System HV Blade 3 W/ or W/O HV Window Blade# 3
SUBMITTED BY:	American Shutter Systems Association, Inc. (ASSA) 4268 Westroads Drive West Palm Beach, Florida 33407

1. PURPOSE OF EVALUATION:

This is a Product Evaluation Report issued by **Walter A. Tillit, Jr., P.E.** (System ID # 1906) to the **American Shutter Systems Association, Inc. (A.S.S.A.)**, based on Rule Chapter No. 9B-72.070, Method 1d of the State of Florida Product Approval, Department of Community Affairs-Florida Building Commission.

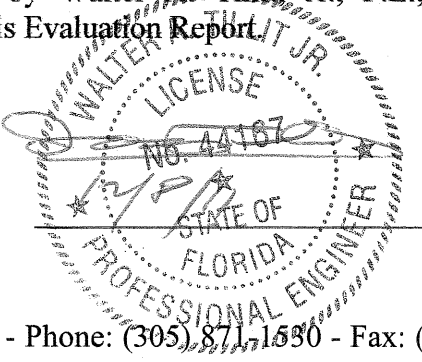
This product is being issued an Evaluation Report as described herein, and has been verified for compliance in accordance with the 2010 edition of the Florida Building Code, and to verify that the product is for the purpose intended at least equivalent to that required by the Code.

This Product Evaluation Report shall be subject to review and revision in case of a Building Code change that may affect its limitations and conditions.

2. EVIDENCE SUBMITTED:

2.1. PRODUCT EVALUATION DOCUMENT (P.E.D.):

Drawing No. 11-191, titled "BERTHA H.V. ACCORDION SHUTTER SYSTEM",HV Blade #3 W/ or W/O HV Window Blade # 3, sheets 1 thru 18 of 18, including 10A, prepared by Tilteco, Inc.; signed and sealed by Walter A. Tillit, Jr., P.E.; dated 11/28/2011. This drawing is an integral part of this Evaluation Report.



2.2. TEST REPORTS:
For HV Blade # 3

Large missile impact and cyclic Loadings under ASTM E 1886 and ASTM E 1996-05 as well as Protocols TAS 201 and 203, as per section 1609.1.2 of the Florida Building Code.

Uniform Static loads in accordance with Protocol TAS 202 and ASSSTM E 330-02 Test reports prepared by American Testing Lab of South Florida, Reports No. 0403.01-08 dated September 5,2008 and 0403.01-08 (addendum), dated October 17,2008 signed and sealed by William R. Mehner, P.E., and Henry Hatten, P.E., and report # 0825.01-10(addendum to 403.01-08), dated October 7, 2010 signed and sealed by Julio E. Gonzales P.E. report # 1220.01-10 dated February 1, 2011 signed and sealed by Julio E. Gonzales P.E.

Tensile test as per QC Metallurgical Report No.8GM-692 dated July 21, 2008 signed and sealed and Report # 8JM-1019, dated October 22, 2008 signed and sealed by Frank E. Grate Jr., P.E., as per ASTM E 8. Report No. 0825.01-10 dated 10/06/2010, signed and sealed by Frank E. Grate Jr., P.E., per ASTM E-8.

Tensile Test as per QC Metallurgical report # 11AM-09 dated January 11,2011 signed and sealed by Frank Grate Jr. P.E. as per ASTM E8 and report #11AM-40 dated January 17,2011, signed and sealed by Frank Grate Jr, P.E. as per ASTM E-8

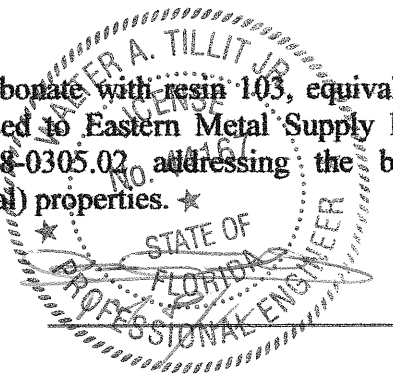
For HV Window Blade #3

Large missile impact and cyclic loading under TAS 201 and 203and ASTM E -1996-05 and ASTM E 1886-05, as per section 1609.1.2 of the Florida Building Code. Uniform Static Loads in Accordance with protocol TAS 202 and ASTM E-330-02. Test reports prepared by American Testing Lab of South Florida, report # 0829.01-08 dated October 17, 2008 signed and sealed by William R. Mehner, P.E., and Henry Hatten P.E. Testing for Polycarbonate Bayer Makrolon 3103 for fire burning characteristics, per sections 2601, 2602, 2607 and 2612 the Florida Building Code, per ETC Laboratories report # ETC -07-1095-19015.1, dated 12/14/07, signed and sealed by Joseph Labora Doldan P.E.

Testing for Polycarbonate Bayer Markrolon 3103 for Weathering /(UV exposure) per ASTM G-155 and ASTM D-638, per section 2612 of the Florida Building Code, per ETC Laboratories report # ETC-07-1095-19015.1, dated 12/14/07, signed and sealed by Joseph Labora Doldan P.E.

Tensile test as per QC metallurgical Report # 8JM-1020, dated October 22, 2008, signed and sealed by Frank E. Grate P.E. as per ASTM E 8

Qualifications for Sabic Innovative Plastic Polycarbonate with resin 103, equivalent as per letter issued by Sabic, dated 7/17/08, addressed to Eastern Metal Supply Inc. to approved # 9034 sheet grade with NOA# 08-0305.02, addressing the burning characteristics, weathering and structural (mechanical) properties.



2.3. STRUCTURAL ENGINEERING CALCULATIONS:

On Bertha H.V. Accordion Shutter System for maximum shutter span vs. design wind load, as well as maximum anchor spacing vs. design wind load and shutter span based on rational and comparative analysis, and in accordance with section 1604 of the Florida Building Code. Calculations prepared by Tilteco, Inc., July 31, 2006, May 23, 2008, July 1, 2011, October 27, 2010 April 27, 2011 and August 8, 2011 signed and sealed by Walter A. Tillit, Jr., P.E.

3. MISSILE IMPACT RESISTANCE:

Large missile impact under section 1609.1.2 of The Florida Building Code, as per ASTM E 1886-05 and ASTM E 1996, as well as Protocol TAS 201 (for HV blade 3as well as HV Window Blade #3).

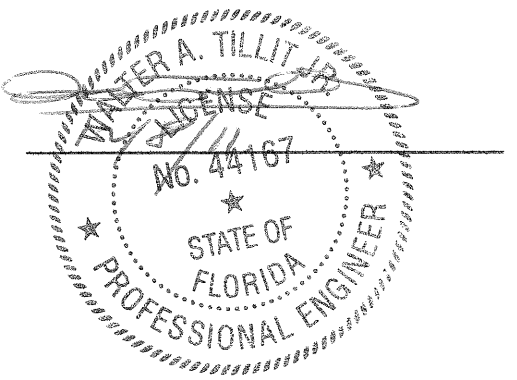
4. WIND LOADS RESISTANCE:

Accordion Shutter System has been verified to sustain wind pressures. Maximum Shutter Span for HV Blade #3 shall be as indicated on sheet 5 of 18 of product Evaluation Document (P.E.D.), Drawing # 11-191 .Maximum anchor spacing shall be as indicated on sheet 6, 7 and 8 of 18 of product Evaluation Document (P.E.D.) drawing #11-191.Maximum Shutter Span and Design load for HV Blade # 3 working in unison with HV Window Blade # 3 shall be ass indicated on sheet 18 of drawing 11-191.

5. INSTALLATION:

For HV Blade 3 Shall be performed strictly in accordance with the details indicated on sheets 4, 9 thru 16 of 18 including 10A of Product Evaluation Document (P.E.D.), drawing No. 11-191. Minimum separation to glass shall be as indicated on sheets 5 of 18 of Product Evaluation Document (P.E.D.), drawing No.11-191. Requirements for use of locks and/or locking rods shall be as indicated on Notes 4 of 18 and note 9 on sheet 1 of 18 of Product Evaluation Document (P.E.D.), drawing No.11-191.

The HV Blade # 3 Working in unison with HV Blade #3 shall be performed strictly in accordance with limitations included on sheet 18 of drawing # 11-191. Minimum separation to glass shall be as indicated on sheet 19of drawing 11-191.



6. MATERIAL CHARACTERISTICS AND SPECIFICATIONS:

Shall be strictly in accordance with General Notes and Components indicated on sheets 1 through 3 of 18 of Product Evaluation Document (P.E.D.), drawing No.11-191. Anchor specifications for HV Blade 3 with or without HV Window Blade #3 shall be as indicated on sheets 6, 7,8 and 10 of 18 of Product Evaluation Document (P.E.D.), drawing No. 11-191.

7. LIMITATIONS AND CONDITIONS OF USE:

7.1. Shall be strictly in compliance with General Notes No. 1,8,9,10,11and 12 Indicated on sheet 1 of 18, of Product Evaluation Document (P.E.D.), drawing No. 11-191 prepared by Tilteco, Inc. and signed and sealed by Walter A. Tillit, Jr., P.E.

7.2. Product **may be** installed within HIGH VELOCITY HURRICANE ZONES as defined on section 1620.2 of the Florida Building Code.

7.3. Product shall only be installed into poured concrete, concrete block, wood frame structures, and Metal stud walls..

Product Evaluation Report prepared by Walter A. Tillit, Jr., P.E. (Florida License No. 44167), President of Tilteco, Inc. (Florida EB-0006719).