TILTECO INC.
TILLIT TESTING & ENGINEERING COMPANY

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PRODUCT EVALUATION REPORT

REPORT NO.:	11-1206.02
DATE:	December 6, 2011
PRODUCT CATEGORY:	Hurricane Shutters
PRODUCT SUB-CATEGORY:	Accordions
PRODUCT NAME:	Bertha H.V. Accordion Shutter System HV Blade 1 W/ or W/O HV Window Blade
SUBMITTED BY:	American Shutter Systems Association, Inc. (ASSA) 4268 Westroads Drive West Palm Beach, Florida 33407

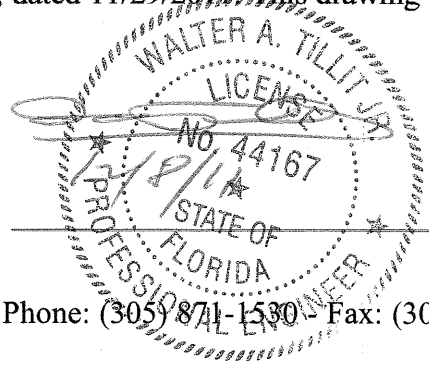
1. PURPOSE OF EVALUATION:

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. 11-193, titled "BERTHA H.V. ACCORDION SHUTTER SYSTEM",HV Blade #1 W/ or W/O HV Window Blade, sheets 1 thru 20 of 20, prepared by Tilteco, Inc.; signed and sealed by Walter A.Tillit, Jr., P.E.; dated 11/29/2011. This drawing is an integral part of this Evaluation Report.



2.2. TEST REPORTS:
For HV Blade 1

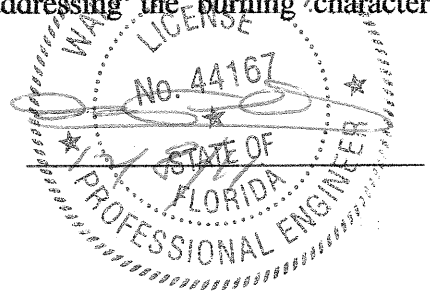
Large missile impact and cyclic Loadings under ASTM E 1886 and ASTM E 1996 as well as Protocols TAS 201 and 203, as per section 1609.1.2 of the Florida Building Code. Uniform Static loads in accordance with Protocol TAS 202. Test reports prepared by American Testing Lab of South Florida, Reports No. 0214.01-03 and 0715.01-03, dated June 27, 2003; and January 21, 2004 respectively, signed and sealed by William R. Mehner, P.E., and Henry Hatten, P.E., jointly with ATL Reports # 1004.01-05 dated 11/16/05, signed and sealed by William R. Mehner, P.E.# 1214.01-05 dated 12/20/05, signed and sealed by Henry Hattem P.E. per protocols TAS 201,202 and 203 completed with ATL Report # 0317.02-06, dated 05/23/06 Signed and Sealed by William Mehner P.E. also per Protocols TAS 201,202 and 203.

Tensile test as per QC Metallurgical Report No.3DM-388 dated May 20, 2003; signed and sealed by Frank E. Grate Jr., P.E., as per ASTM E 8. Report No. 11CM-223, dated 03/04/2011, signed and sealed by Frank E. Grate Jr.,P.E., per ASTM E-8, as well as Reports # 10FM-718, dated June 22, 2010, and Report # 11CM-233, dated 0304/2011 signed and sealed by Frank E. Grate Jr. P.E. as per ASTM E-8

Additionally, Report No. 0210.01-11, dated 02/11/2011, signed and sealed by Henry Hattem, P.E. and # 1220.01-10 dated February 1, 2011 signed and sealed by Julio E. Gonzales P.E., qualifying stronger Blade 1 with testing of HV Blade 3 (weaker) for Keystone mountings.

For HV Window Blade 1A

Large missile impact and cyclic loading under ASTM E-1886 and E 1996, as per section 1609.1.2 of the Florida Building Code. Uniform Static Loads in Accordance with ASTM E-330 per Section 1715.5.3 Test reports prepared by American Testing Lab of South Florida, report # 0505.01-08 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 # 8GM-693, dated July 21, 2008 signed and sealed by Frank E. Grate P.E. as per ASTM E 8.
Qualification 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 and ASTM E 1996, as well as Protocol TAS 201 (for Blade 1 and HV blade 1 qualified thru HV3 Blade, Weaker Blade For Keystone Mounting) And per ASTM E 1886 and E 1996 (for Blade 1A).

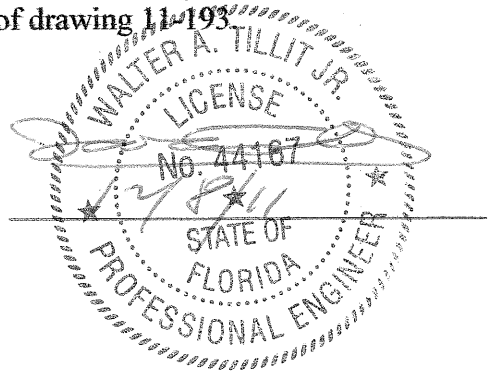
4. WIND LOADS RESISTANCE:

Accordion Shutter System has been verified to sustain wind pressures. Maximum Shutter Span for HV Blade 1 shall be as indicated on sheet 11 of 20 of product Evaluation Document (P.E.D.), Drawing # 11-193 at detail "M" on Sheet 7 (for Keystone Mounting "M"), 20 (for metals studs) and 12,13,14,15 of 20 of Product Evaluation Document (P.E.D.) , Drawing # 11-193. Maximum shutter Span and anchor spacing for Window Blade 1A shall be as indicated on sheet 19 of drawing #11-193

5. INSTALLATION:

For HV Blade 1 Shall be performed strictly in accordance with the details indicated on sheets 5, 6, 7, 8, 9, 10, 16, 17, 18, 19 and 20 of 20 of Product Evaluation Document (P.E.D.), drawing No. 11-193. Minimum separation to glass shall be as indicated on sheets 11 of 20 of Product Evaluation Document (P.E.D.), drawing No.11-193. Requirements for use of locks and/or locking rods shall be as indicated on Notes 5 of 20 and note 10 on sheet 1 of 20 of Product Evaluation Document (P.E.D.), drawing No.11-193.

The HV Blade Working in unison with Hv Blade 1A, shall be performed strictly in accordance with limitations included on sheet 19 of drawing # 11-193. Minimum separation to glass shall be as indicated on sheet 19of drawing 11-193.



6. MATERIAL CHARACTERISTICS AND SPECIFICATIONS:

Shall be strictly in accordance with General Notes and Components indicated on sheets 1 through 4 of 20 of Product Evaluation Document (P.E.D.), drawing No.11-193. Anchor specifications for HV Blade 1 shall be as indicated on sheets 13, 15, and 20 of 20 of Product Evaluation Document (P.E.D.), drawing No. 11-193.

7. LIMITATIONS AND CONDITIONS OF USE:

7.1. Shall be strictly in compliance with General Notes No. 1, 2, 9, 10, 11, 12 and 13 Indicated on sheet 1 of 20, of Product Evaluation Document (P.E.D.), drawing No. 11-193 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.
7.4 Limitations of use Blade HV1 USED in unison with blade HV1A shall be as per sheet 19 of 20 of drawing #11-193

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