

# TEXAS DEPARTMENT OF INSURANCE

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## PRODUCT EVALUATION SHU-144

Effective February 1, 2007

*The following product has been evaluated for compliance with the wind loads specified in the **International Residential Code (IRC)** and the **International Building Code (IBC)**. This product shall be subject to reevaluation 3 years after the effective date.*

*This product evaluation is not an endorsement of this product or a recommendation that this product be used. The Texas Department of Insurance has not authorized the use of any information contained in the product evaluation for advertising, or other commercial or promotional purpose.*

*This product evaluation is intended for use by those individuals who are following the design wind load criteria in Chapter 3 of the IRC and Section 1609 of the IBC. The design loads determined for the building or structure shall not exceed the design load rating specified for the products shown in the limitations section of this product evaluation. This product evaluation does not relieve a Texas licensed engineer of his responsibilities as outlined in the Texas Insurance Code, the Texas Administrative Code and the Texas Engineering Practice Act.*

### **ES55SUP End Retention Aluminum Roll Up Shutters, Impact Resistant, manufactured by**

**Croci North America**  
**6360 Topaz Court**  
**Fort Myers, Florida 33912**  
**(800) 951-1195**

will be accepted for use in designated catastrophe areas along the Texas Gulf Coast when installed in accordance with this product evaluation and the design drawings referenced in this evaluation report.

### **PRODUCT DESCRIPTION**

The ES55SUP roll up shutters are manufactured from extruded aluminum. The roll up shutters are assembled using interlocking extruded aluminum slats. The components of the roll up shutter system are as follows:

**Slats:** 55 mm slats manufactured from 6063-T6 aluminum alloy. The slat size is 0.335" by 2.170" x 2.513". The slats have a 0.75" notch at each end.

**Aluminum side rails:** Manufactured from 6063-T6 aluminum. The aluminum side rails are 3.150" in length and 1.150" in depth.

**End connectors:** Nylon with metal inserts. The end connectors are 2.480" x 0.992". The end connectors are attached to the end of every other slat with two (2) No. 10 x 2" sheet metal screws per end connector.

**Aluminum tubes:** Manufactured of 6063-T6 aluminum. The tubes are 2" x 2", 2" x 3", or 3" x 3". The wall thickness is 0.125" or 0.25".

**Sill Angle:** Manufactured of 6063-T6 aluminum. The sill angle is 1" x 2" x 0.125". The sill angle is used with when the shutter is mounted directly to the outside of the wall opening.

**Mullion Clip Angle:** Manufactured of 6063-T6 aluminum. The mullion clip angle is 2" x 3" x 0.1875". The mullion clip angle is used to secure each end of the mullion to the structure.

**Mullion tubes:** Manufactured of 6063-T6 aluminum. The mullions are 4" wide. The mullions are available in 4" and 6" depths. The wall thickness is 0.125" or 0.25".

## LIMITATIONS

**Design Drawings:** The ES55SUP roll up shutters shall be installed in accordance with Drawing No. ES 55 SUP, sheets 1 through 7 of 7, dated July 17, 2006, titled "Aluminum 55 mm End Retention Roll-Up Hurricane Shutter," signed and sealed by Richard W. Arnold, P.E. on September 17, 2006. The stated drawings will be referred to as "approved drawings" in this report. A copy of the approved drawings shall be available at the job site.

**Design Pressure Rating:** The design pressure rating for the roll up shutters is dependant on several factors, including the span, the mounting condition, and the mullion span. Refer to the approved drawings to determine the allowable design pressure rating for the shutter assembly based on the configuration of the roll-up shutter assembly used. In no case shall the design pressure rating exceed 70 psf.

**Separation Distance from Glazed Openings:** Roll up shutters mounted directly to the outside of the wall opening (see page 3 of 7 of the approved drawings) shall have a minimum separation distance of 1 inch. The remaining mounting conditions have no required minimum separation distance from glazed openings.

**Span Configurations:** The shutters can be installed as a single span configuration or a multiple span configuration. Multiple span configurations require a mullion.

**Mounting Configurations:** The shutters may be mounted directly to the outside of the wall opening (see page 3 of 7 of the approved drawings); mounted inside the wall opening using aluminum tubes (see page 4 of 7 of the approved drawings); and built-out from the outside of the wall opening using aluminum tubes (see page 5 of 7).

**Wall Framing Construction:** The shutters may be mounted to concrete (minimum compressive strength specified on approved design drawings); concrete-filled concrete masonry block (minimum compressive strength specified on approved design drawings), hollow concrete masonry block (minimum compressive strength specified on approved design drawings) or wood framing with a minimum specific gravity of 0.64 (Note: this is not the specific gravity for Southern Yellow Pine lumber). For built-out mounting conditions, wood wall framing is not permitted. For mulled assemblies, wood wall framing and hollow concrete masonry block wall framing is not permitted.

**Maximum Spans:** The maximum allowable span is the horizontal distance from the end of one aluminum side rail to the end of the other aluminum side rail (hence, the span includes the aluminum side rails and the slats). The maximum allowable spans are specified on page 3 of 7 of the approved drawings (direct mount), page 4 of 7 of the approved drawings (inside mount), page 5 of 7 of the approved drawings (built out mount), or page 6 of 7 of the approved drawings (mulled assemblies). In no case shall the span exceed 231 inches.

**Maximum Mullion Height:** The maximum allowable vertical mullion height is specified in tables on page 6 of 7 of the approved drawings.

**Product Identification:** The roll up shutters shall be labeled with the manufacturer's name, large missile impact resistant shutter, and ES55SUP series roll shutters.

**Impact Resistance:** These shutter assemblies satisfies the Texas Department of Insurance's criteria for protection from windborne debris in both the **Inland I zone** and the **Seaward zone**. The shutter assemblies passed Missile Level D specified in ASTM E 1996-01. The shutter assemblies may be installed at any height on the structure as long as the design pressure rating for the assemblies is not exceeded.

## INSTALLATION INSTRUCTIONS

**General Installation Requirements:** The shutters shall be installed in accordance with the manufacturer's installation instructions, the approved drawings, and this product evaluation report.

### **Direct Mount (Page 3 of 7 of Approved Drawings)**

- Attachment of aluminum side rails specified on the right side of the page on the approved drawings.
- If a shutter sill is used, it shall be attached as specified on the approved drawings.

### **Inside Mount (Page 4 of 7 of Approved Drawings)**

- Size of aluminum tubes required shall be as specified on the approved drawings. Refer to Section B-B.
- The attachment of the aluminum tubes to the structure shall be as specified on the right side of the page on the approved drawings.
- The attachment of the aluminum side rails to the aluminum tubes shall be as specified on the approved drawings. Refer to Section B-B.

### **Built Out Mount (Page 5 of 7 of Approved Drawings)**

- Size of aluminum tubes required shall be as specified on the approved drawings. Refer to Section B-B.
- The attachment of the aluminum tubes to the structure shall be as specified on the right side of the page on the approved drawings.
- The attachment of the aluminum side rails to the aluminum tubes shall be as specified on the approved drawings. Refer to Section B-B.

### **Mulled Assemblies (page 6 of 7 of Approved Drawings):**

- The required size of the aluminum mullion tube shall be as specified in the tables on the design drawings. The required mullion size is a function of the mullion height and the span of the shutter.
- The attachment of the mullion clip angles to the top and bottom of the mullion tubes shall be as specified on the design drawings. The required length of the mullion clip angle is specified on the approved drawings. Refer to Section C-C and the "Vertical Supporting Member Connection to Bracket" table. Note: the connection capacity (in lbs) is determined using the equation on the table.
- The attachment of the mullion clip angles to the structure shall be as specified in the approved drawings. The required length of the mullion clip angle is specified on the approved drawings. Refer to Section C-C and the "Connection to Ceiling and Floor" table. Note: the connection capacity (in lbs) is determined using the equation on the table.
- The attachment of the aluminum side rail to the mullion shall be as specified on the approved drawings. Refer to Section C-C.

**INSTALLATION INSTRUCTIONS (Continued)**

- Where the aluminum side rails attach to the structure (at each extreme end of the shutter configuration), the anchor requirements specified on the right side of the page of the approved drawings shall be used.

**Note:** All fasteners shall be corrosion resistant as specified in the International Residential Code (IRC), the International Building Code (IBC), and the Texas Revisions. A copy of the approved drawings shall be available at the job site.