

## **Loss Mitigation Grant Program Wind Resistive Device (WRD) Product Evaluation**

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The product as described herein has been evaluated by the Department of Commerce and Consumer Affairs (DCCA) for compliance with the technical requirements for wind resistive devices installed in single or multi-family residential dwellings. Installation costs of approved products are partially reimbursable under the provisions of the Loss Mitigation Grant Program. The results of the product evaluation are presented in the following report.

### **1.0 Product Information**

#### **1.1 Product Name:**

LLumar Magnum 8 mil Safety/Security Film

#### **1.2 Description:**

LLumar Magnum 8 mil Safety/Security Film is a laminated film applied to the surface of glazed openings to reduce the transmission of solar energy and to provide additional impact resistance.

#### **1.3 Category:**

Submitted for evaluation as a WRD option 3- Exterior opening protection

#### **1.4 Submitted By:**

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## 2.0 Product Evaluation

### 2.1 Wind Loads:

#### a. Static Pressure:

LLumar Magnum 8 mil Safety/Security Film was tested per ASTM E330 (Static Load Test), ASTM E331 (Water Infiltration Test), and ASTM E283 (Air Infiltration Test). The results of these tests and allowable loads are given in table 1.

Table 1. Static Pressure Test Results

Test Method	Test Conditions	WRD Requirements	Test Conclusion
Air Infiltration Test	1.57 psf & 6.24 psf	n/a	PASS
Water Infiltration Test	7.50 psf	n/a	PASS
Static Load Test	+50.0 psf, -50.0 psf	IBC 1714.5.2	PASS

#### b. Cyclic Wind Pressure Loading:

Following large missile impact testing, units were tested under ASTM E1886 and E1996 (Cyclic Wind Pressure Loading). The results of the test are included in table 2.

Table 2. Cyclic Loading Test Results

Test Method	Test Conditions	WRD Requirements	Test Conclusion
Cyclic Load Test	+80.0 psf, -80.0 psf	+25.0 psf, -35.0 psf	PASS

### 2.2 Impact Resistance:

LLumar Magnum 8 mil Safety/Security Film was tested per ASTM E1886 and ASTM E1996 (Large missile impact test) using a 2x4 weighing 4.5 lbs. fired at 40 feet per second.

Table 3. Impact Test Results

Test Method	Test Conditions	WRD Requirements	Test Conclusion
Impact Test	Missile Type C	Missile Type C	PASS

### 2.3 Installation:

LLumar Magnum 8 mil Safety/Security Film is to be installed in accordance with the manufacturer's published installation instructions and engineering drawings.

The manufacturer's published installation instructions shall be strictly adhered to and a copy of these shall be available at all times on the job site during installation.

According to the test report submitted June 27, 2007, the glazing of the test assembly had 5/8" of glass bite. Approval of this product based solely upon these results requires that the installed openings conform to the test assembly and also have 5/8" of glass bite.

**2.4 Substantiating Data:**

- a. Manufacturer's descriptive literature, specifications and installation instructions
- b. Technical Bulletin TBF-15, Flat Glass Installation Guidelines
- c. Technical Bulletin TBF-44, Llumar Magnum Edge Grip Installation Instructions
- d. Test Report on Large Missile Impact Test, Cyclic Wind Pressure Test, and Uniform Static Pressure Test on 8 mil Llumar Magnum film, prepared by Hurricane Test Laboratory, LLC., Test Report No. G286-0807-06 dated 12/18/06, Signed and Sealed by Vinu J. Abraham, P.E., F.L. Reg. #53820

**3.0 Findings**

Original review of data submitted on Oct. 3, 2006 indicated that the LLumar Magnum 8 mil Safety/Security Film did not conform to the requirements of the loss mitigation grant program. However, further test data submitted on June 27, 2007 substantiates its approval at this time.

The June 27, 2007 submission of test results indicate that this product meets missile level rating C (results submitted on Oct. 3, 2006 indicated only a missile rating of A). Per the technical specifications, a minimum missile level rating of C is required to meet the WRD requirements for all fixed or operable windows, sliding doors, and skylights. The LLumar Magnum 8 mil Safety/Security Film may be approved for use on operable windows, sliding doors, and skylights of all construction types provided that the windows, sliding doors, or skylights has been installed per approved details and designed to meet the wind load requirements of IBC 1714.5.2.

**3.1 Limitations:**

- a. LLumar Magnum 8 mil Safety/Security Film qualifies as an approved WRD product for use on operable windows, sliding doors, and skylights.
- b. The windows, sliding doors, or skylight must be designed and installed per Engineer certified details to meet the wind load requirements of IBC 1714.5.2.
- c. LLumar Magnum 8 mil Safety/Security Film must be installed in accordance with the installation requirements of this report and the manufacturer's published installation instructions.
- d. To satisfy the conditions of this approval solely based upon test results a minimum glass bite dimension of 5/8" shall be provided in the installation details.

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October 8, 2007