



## SECTION 08873

### SAFETY AND SECURITY FILM

#### PART 1 GENERAL

##### 1.1 SECTION INCLUDES

- A. Safety and Security film field applied to existing glass.
- B. Safety and Security film factory applied to glazed surfaces.

##### 1.2 REFERENCES

- A. American Society for Testing Materials (ASTM)
- B. American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE)
- C. Association of Industrial Metallizers, Coaters and Laminators (AIMCAL)
- D. American National Standards Institute (ANSI)
- E. International Standards Organization (ISO)
- F. International Window Film Association (IWFA)
- G. General Services Administration (GSA)
- H. Consumer Products Safety Commission (CPSC)
- I. Code of Federal Regulations (CFR)

##### 1.3 PERFORMANCE REQUIREMENTS

- A. Safety Glazing Impact Performance:
  - 1. Meets ANSI Z97.1 Class A,-Unlimited and 16 CFR 1201 Category II 400 ft-lbs impact resistance
  - 2. Meets ANSI Z97.1 Class B and 16 CFR 1201 Category I 150 ft-lbs impact resistance
  - 3. Meets accelerated weathering requirements in accordance with ANSI Z97.1
- B. Flammability: Meets surface burning characteristics in accordance with ASTM E-84 Class A
  - 1. Flame Spread Index = 15
  - 2. Smoke Development Index = 20
- C. Blast Mitigation Performance: Independent test results when tested in accordance with GSA TS01-2003, ISO 16933, ASTM F1642 and UFC 4-010-01
  - 1. GSA TS-01-2003, GSA Performance Condition with a minimum blast pressure of 4 psi-28 psi-msec when applied with GE SCS2000 Silpruf on 1/4 inch (6 mm) single pane annealed glass: 3B.
  - 2. GSA TS-01-2003, GSA Performance Condition with a minimum blast pressure of 4 psi-28 psi-msec on 1/4 inch (6 mm) double pane annealed glass: 3B.
  - 3. GSA TS-01-2003, GSA Performance Condition with a minimum blast pressure of 4

psi-28 psi-msec on 1/4 inch (6 mm) single pane annealed glass: 3B.

- D. Volatile Organic Compound Content:
  - 1. Compliant with the performance standard established for low-emitting materials under the CDPH, the Collaborative for High Performance Schools (CHPS) and the LEED v4 programs.

#### 1.4 SUBMITTALS

- A. Submit under provisions of Section 01 30 00.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
  - 1. Physical properties and independent testing agency reports showing compliance with specified tests.
  - 2. Preparation instructions and recommendations.
  - 3. Storage and handling requirements and recommendations.
  - 4. Installation methods.
- C. Shop Drawings: Detailing installation of film, anchoring accessories, and sealant.
- D. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.
- E. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
- F. Manufacturer's warranty information.

#### 1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Products specified shall be a standard product of a manufacturer regularly engaged in the manufacturing and distribution of such products for a minimum of 10 years.
  - 1. Provide a Quality Management certificate stating the manufacturing facility's location conformance with ISO 9001:2004
  - 2. Provide an Environmental Management certificate stating the manufacturing facility's location conformance with ISO 14001:2008
- B. Installer Qualifications: Documented experience in the application of self-adhesive window films with at least 3 applications of similar size and complexity, and approved by the window film manufacturer.
- C. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
  - 1. Apply film to one window designated by Architect.
  - 2. Do not proceed with remaining work until workmanship and color, is approved by Architect.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store products indoors in manufacturer's unopened packaging until ready for installation.

#### 1.7 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

#### 1.8 WARRANTY

- A. See Section 01 78 23 - Preventative Maintenance Instructions.
- B. Provide film manufacturer's limited warranty against failure of film, including change of color, peeling, bubbling, rippling, cracking, delamination and demetallization; includes cost of material and labor for removal and reinstallation. Duration of warranty shall be as follows:
  - 1. Twelve Year Limited Warranty for the following safety and security film products:
    - a. Solar Gard Armorcoat 7-mil Clear

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Solar Gard®, which is located at: 4540 View Ridge Ave. ; San Diego, CA 92123; Toll Free Tel: 877-273-4364; Tel: 858-576-0200; Fax: 858-571-3605; Email:[info@solargard.com](mailto:info@solargard.com); Web:[www.solargard.com](http://www.solargard.com)
- B. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00.

### 2.2 SAFETY AND SECURITY FILM

- A. Solar Gard Armorcoat 7-mil clear safety film shall have the following nominal properties when applied to 1/4 inch (6 mm) clear glass with pressure sensitive adhesive.
  - 1. Film Performance Results, Nominal
    - a. Film Color: Clear
    - b. Solar Transmittance: 72 percent
    - c. Solar Absorptance : 20 percent
    - d. Solar Reflectance: 8 percent
    - e. Visible Light Transmittance: 87 percent
    - f. Visible Light Reflectance: (Exterior) 10 percent
    - g. Visible Light Reflectance: (Interior) 10 percent
    - h. Emissivity: .96
    - i. U-Factor (Winter): 1.08
    - j. Shading Coefficient: .90
    - k. Solar Heat Gain Coefficient: .79
    - l. Ultraviolet Light Blocked (300-380 nanometers): > 99 percent
    - m. Total Solar Energy Rejected: 21 percent
  - 2. Film Performance Results when applied to 1/4 inch (6 mm) clear insulated glass with pressure sensitive adhesive (Nominal)
    - a. Film Color: Clear
    - b. Solar Transmittance: 57 percent
    - c. Solar Absorptance : 31 percent
    - d. Solar Reflectance: 12 percent
    - e. Visible Light Transmittance: 78 percent
    - f. Visible Light Reflectance: (Exterior) 16 percent
    - g. Visible Light Reflectance: (Interior) 17 percent
    - h. Emissivity: .96
    - i. U-Factor (Winter): .49
    - j. Shading Coefficient: .79
    - k. Solar Heat Gain Coefficient: .69
    - l. Ultraviolet Light Blocked (300-380 nanometers): > 99 percent
    - m. Total Solar Energy Rejected: 31 percent

3. Physical and Thermal Properties, Nominal
  - a. Film Thickness: 7 mil (175 micron)
  - b. Peel Strength: >2,500 g/in (985 gm./cm).
  - c. Tensile Strength: 30,000 lbs./in<sup>2</sup> (2,110 kg/cm<sup>2</sup>)
  - d. Break Strength: 210 lbs./in (38 kg/cm)
  - e. Combustion Rate: Negligible
  - f. Melting Point: 500° F (260° C)
  - g. ASTM D 4830 Puncture Test: 115 lbs. (52 kg)

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

### 3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

### 3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions. Installation must be accomplished by a recognized professional installer of film for energy control purposes or safety and security purposes. Completed work must meet IWFA visual acceptance standard.
- B. Install without bubbles, ripples, drips, dirt, cuts, tears or gaps between film and frame.
- C. Clean newly installed film and window frames after installation.
- D. Clean up cleaning solutions, run-off cleaning water and adhesive mounting solution.

### 3.4 PROTECTION

- A. Protect installed products until completion of project.
- B. Where installed film could be damaged by subsequent construction provide tape warning strips or barricades to prevent contact.

END OF SECTION