



SECTION 08874

SAFETY AND SECURITY FILM

Copyright 2004 - 2008 ARCAT, Inc. - All rights reserved

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 RELATED SECTIONS

- A. Section 08110 - Steel Doors and Frames: New doors with glazing to receive film.
- B. Section 08510 - Steel Windows: New windows to receive film.
- C. Section 08520 - Aluminum Windows: New windows to receive film.
- D. Section 08590 - Window Restoration and Replacement: Existing windows to receive film.
- E. Section 08900 - Glazed Curtain Walls: New glazing to receive film.

1.3 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. Government Services Administration (GSA)

- H. Consumer Products Safety Commission (CPSC)
- I. Code of Federal Regulations (CFR)

1.4 PERFORMANCE REQUIREMENTS

- A. Storm Testing: 8 mil Solar Gard Armorcoat safety films shall be capable of meeting the following tests:
 - 1. ASTM E-1886, Standard Test Method for Missile Impact and Cycling On Exterior Windows, Shutters, Doors and Curtain Walls - Large Missile C.
 - 2. ASTM E-1996, Standard Specification for Missile Impact and Cycling On Exterior Windows, Shutters, Doors and Curtain Wall - Large Missile C.
 - 3. ASTM E-283-04, Test Method for Airflow through Exterior Windows, Shutters, Doors and Curtain Walls.
 - 4. ASTM E-330-02 Test Method for Structural Performance of Exterior Windows, Shutters, Doors and Curtain Walls by uniform Static Air Pressure Difference.
 - 5. ASTM E-331-00, Test Method for Structural Performance of Exterior Windows, Shutters, Doors and Curtain Walls by uniform Static Air Pressure Difference.
- B. Bomb Blast Simulation: Independent testing of Solar Gard safety films with results from high-explosive tests evaluating the capability of Solar Gard window film in 4 mil to 14 mil thicknesses to reduce the hazards of flying glass shards during an explosion.
 - 1. GSA TS-01-2003, GSA Performance Condition with a minimum blast pressure of 4 psi-28 psi-msec when applied as a daylight application 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 when applied as a daylight application on 1/4 inch (6 mm) single pane tempered glass: 3B.
 - 3. GSA TS-01-2003, GSA Performance Condition with a minimum blast pressure of 4 psi-28 psi-msec when applied with Dow Corning 995 on 1/4 inch (6 mm) single pane annealed glass: 3A.
 - 4. 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 tempered glass: 2.
 - 5. 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) double pane annealed glass: 2.
 - 6. ISO 16933 Hazard Rating with a minimum blast pressure of 7 psi-36 psi-msec when applied with GE SCS2000 Silpruf on 1/4 inch (6 mm) double pane tempered glass: "Hazard Rating B (EXV33(B))" .
 - 7. ISO 16933 Hazard Rating with a minimum blast pressure of 7 psi-36 psi-msec when applied with GE SCS2000 Silpruf on 1/4 inch (6 mm) double pane annealed glass: "Hazard Rating C (EXV33(C))".
 - 8. ASTM F 1642 Hazard Level with a minimum blast pressure of 4 psi-28 psi-msec when applied with GE SCS2000 Silpruf on 1/4 inch (6 mm) double pane annealed glass: "No Hazard".
 - 9. ASTM F 1642 Hazard Level with a minimum blast pressure of 7 psi-36 psi-msec when applied with GE SCS2000 Silpruf on 1/4 inch (6 mm) double pane tempered glass: "No Hazard".
 - 10. UFC 4-010-01 Protection Level with a minimum blast pressure of 4 psi-28 psi-msec when applied with GE SCS2000 Silpruf on 1/4 inch (6 mm) double pane annealed glass: "High Level of Protection".
 - 11. UFC 4-010-01 Protection Level with a minimum blast pressure of 7 psi-36 psi-msec when applied with GE SCS2000 Silpruf on 1/4 inch (6 mm) double

pane tempered glass: "High Level of Protection".

- C. Impact Resistance: Solar Gard safety films shall be capable of meeting the following tests:
 - 1. 4 mil Solar Gard safety films:
 - a. Passes ANSI Z 97.1 (100 - 150 ft lb).
 - b. Passes CFR 1201, Category I (150 ft lb impact).
 - 2. 7 mil and thicker Solar Gard safety films:
 - a. Passes ANSI Z 97.1 (100 - 150 ft lb).
 - b. Passes CFR 1201, Category II.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01300.
- 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.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Solar film manufacturer shall be the standard product of a manufacturer regularly engaged in the manufacture and distribution of such products in satisfactory use for a minimum of 5 years. Manufacturing facility shall be ISO 9001-2000 and ISO 14001-2004 standard registration.
- 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 solar 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.

1.7 DELIVERY, STORAGE, AND HANDLING

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

1.8 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.

1.9 WARRANTY

- A. See Section 01780 - Closeout Submittals for additional warranty requirements.
- B. Provide film manufacturer's limited warranty against failure of film, including change of color, peeling, bubbling, rippling, cracking, delamination and demetalization; include 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 4 mil Solar Bronze 35
 - b. Solar Gard Armorcoat 8 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; Web: www.solargard.com
- B. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 SAFETY AND SECURITY FILM

- A. Solar Gard Armorcoat 8 Mil Clear Safety and Security film shall have the following properties when applied to 1/4 inch (6 mm) clear float glass.
 - 1. Film Performance Results, Nominal:
 - a. Solar Transmittance 69 percent.
 - b. Solar Absorptance 21 percent.
 - c. Solar Reflectance 10 percent.
 - d. Visible Light Transmittance 83 percent.
 - e. Visible Light Reflectance (Exterior) 13 percent.
 - f. Visible Light Reflectance (Interior) 12 percent.
 - g. Emissivity: .88.
 - h. U-Factor (Winter) 1.11.
 - i. Shading Coefficient .87.
 - j. Solar Heat Gain Coefficient .74.
 - k. Ultraviolet Light Blocked (300-380 nanometers) greater than 99 percent.
 - l. Total Solar Energy Rejected 24 percent.
 - 2. Physical and Thermal Properties, Nominal:
 - a. Film Thickness: 8.0 mils (200 microns).
 - b. Peel Strength: 2,500 g/in (984 g/cm).
 - c. Tensile Strength; 30,000 lbs/sq in (2,110 kg/cm sq).
 - d. Break Strength; 240 lbs/in (43 kg/cm).
 - e. Elongation at Break: greater than 100 percent.
 - f. Combustion Rate: Negligible.
 - g. Melting Point: 260-265 degrees C.
 - h. ASTM D 4830 Puncture Test: 141 lbs (64 kg).
 - i. Meets GSA Level C criteria (3B at 4psi, 28 psi/milliseconds).

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.