



SECTION 08 87 00

ANTI-GRAFFITI FILM

Saint-Gobain Solar Gard is the first window film manufacturer to complete a full Life Cycle Assessment (LCA) of its architectural window film products, resulting in third-party verified Environmental Product Declarations (EPDs). These EPDs provide transparent, standardized data on the environmental impact of Solar Gard's products, reinforcing the company's commitment to sustainability and responsible manufacturing. GENERAL

1.1 SECTION INCLUDES

- A. Anti-graffiti film field applied to existing glass.
- B. Anti-graffiti film factory applied to glazed surfaces.

1.2 REFERENCES

- A. LBNL WINDOW SOFTWARE - A computer program for calculating total window thermal performance indices (i.e. U-values, solar heat gain coefficients, and visible transmittances).
- B. NFRC 100/200 - Standard Methods of Test for Solar Absorbance, Reflectance and Transmittance of Materials Using Integrating Spheres.
- C. ASTM E 903 - Standard Methods of Test for Solar Absorbance, Reflectance and Transmittance of Materials Using Integrating Spheres.
- D. ASTM D1044 - Standard Method of Test for Resistance of Transparent Plastics to Surface Abrasion (Taber Abrader Test).
- E. ASTM D1003 - Standard Test Method for Haze and Luminous Transmittance of Transparent Plastics
- F. ASTM E 84 - Standard Method of Test for Surface Burning Characteristics of Building Materials.
- G. ASTM E162 - Standard Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source
- H. ASTM E662 - Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials
- I. ISO 5660 – Standard test method for heat release, smoke production and mass loss rate — Part 1: Heat release rate (cone calorimeter method) and smoke production rate (dynamic measurement)
- J. ISO 14025:2006 - Establishes the principles and specifies the procedures for developing Type III environmental declaration programs and Type III environmental declarations.
- K. ISO 21930:2017 - Provides the principles, specifications and requirements to develop an environmental product declaration (EPD) for construction products and services, construction elements and integrated technical systems used in any type of construction

works.

1.3 PERFORMANCE REQUIREMENTS

- A. Flammability: Meets surface burning characteristics in accordance with ASTM E162
 - 1. Radiant Panel Index (I_s) = < 1
- B. Smoke Density: Meets maximum specific optical density in accordance with ASTM E162 determined by the project
- C. Flammability: Meets surface burning characteristics in accordance with ASTM E-84 Class A
 - 1. Flame Spread Index = < 25
 - 2. Smoke Development Index = < 450
- 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. Independent accredited testing agency reports showing compliance with specified tests in section 1.3.
 - 2. Preparation instructions and recommendations.
 - 3. Storage and handling requirements and recommendations.
 - 4. Installation methods.
- C. Provide a Film to Glass Stress Analysis of the existing glass and proposed glass/solar film combination as recommended by the film manufacturer.
- D. Provide energy saving simulations report using Efilm energy analyzing software application to determine available energy cost reduction and savings.
- E. Provide third-party verified Environmental Product Declaration (EPD) documentation for all window film products, compliant with ISO 14025 and ISO 21930. The EPD shall be current, publicly available, and included in the submittal package.
- F. Shop Drawings: Detailing installation of film, anchoring accessories, and sealant.
- G. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.
- H. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
- I. 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
 - 2. Provide an Environmental Management certificate stating the manufacturing facility's location conformance with ISO 14001

- 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.
- B. Dispose of any hazardous materials, and materials contaminated by hazardous materials, in accordance with requirements of local authorities.

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. 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. Three (3) Year Limited Warranty for the following anti-graffiti film products:
 - a. Solar Gard Graffitigard Anti-Graffiti Films

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: 866-572-1922; Tel: 858-576-0200; Email:info@solargard.com; Web:www.solargard.com
- B. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00.

2.2 ANTI-GRAFFITI FILM

- A. Solar Gard Graffitigard 4-mil clear anti-graffiti film with pressure sensitive adhesive shall have the following nominal properties when applied to 1/4 inch (6 mm) clear glass.
 - 1. Film Performance Results, Nominal
 - a. Film Color: Clear
 - b. Visible Light Transmittance: 86 percent
 - c. Visible Light Reflectance: (Exterior) 10 percent
 - d. Visible Light Reflectance: (Interior) 10 percent
 - e. Total Solar Energy Rejected: 22 percent
 - f. Solar Heat Gain Coefficient: .78
 - g. U-Factor Btu/h-ft² F (Winter): 1.02
 - h. Solar Transmittance: 72 percent
 - i. Solar Absorptance: 20 percent

- j. Solar Reflectance: 8 percent
 - k. Ultraviolet Light Blocked (300-380 nanometers): > 99 percent
 - l. UV Tdw-ISO @ 300 to 700 nm: 63 percent
2. Film Performance Results when applied to 1/4 inch (6 mm) clear insulated glass (Nominal)
- a. Film color: Clear
 - b. Visible Light Transmittance: 77 percent
 - c. Visible Light Reflectance: (Exterior) 16 percent
 - d. Visible Light Reflectance: (Interior) 16 percent
 - e. Total Solar Energy Rejected: 33 percent
 - f. Solar Heat Gain Coefficient: .67
 - g. U-Factor Btu/h-ft² F (Winter): .47
 - h. Solar Transmittance: 57 percent
 - i. Solar Absorptance: 30 percent
 - j. Solar Reflectance: 13 percent
 - k. Ultraviolet Light Blocked (300-380 nanometers): > 99 percent
 - l. UV Tdw-ISO @ 300 to 700 nm: 56 percent
3. Physical Properties, Nominal
- a. Film Thickness: 4-mil (100 micron)
 - b. Peel Strength: < 500 g/in (1270 g/cm)
- B. Solar Gard Graffitiard 6-mil 2-ply clear anti-graffiti film with pressure sensitive adhesive shall have the following nominal properties when applied to 1/4 inch (6 mm) clear glass.
1. Film Performance Results, Nominal
- a. Film Color: Clear
 - b. Visible Light Transmittance: 87 percent
 - c. Visible Light Reflectance: (Exterior) 10 percent
 - d. Visible Light Reflectance: (Interior) 10 percent
 - e. Total Solar Energy Rejected: 22 percent
 - f. Solar Heat Gain Coefficient: .78
 - g. U-Factor Btu/h-ft² F (Winter): 1.02
 - h. Solar Transmittance: 73 percent
 - i. Solar Absorptance: 18 percent
 - j. Solar Reflectance: 9 percent
 - k. Ultraviolet Light Blocked (300-380 nanometers): > 99 percent
 - l. UV Tdw-ISO @ 300 to 700 nm: 62 percent
2. Film Performance Results when applied to 1/4 inch (6 mm) clear insulated glass (Nominal)
- a. Film color: Clear
 - b. Visible Light Transmittance: 77 percent
 - c. Visible Light Reflectance: (Exterior) 17 percent
 - d. Visible Light Reflectance: (Interior) 17 percent
 - e. Total Solar Energy Rejected: 33 percent
 - f. Solar Heat Gain Coefficient: .67
 - g. U-Factor Btu/h-ft² F (Winter): .47
 - h. Solar Transmittance: 58 percent
 - i. Solar Absorptance: 29 percent
 - j. Solar Reflectance: 13 percent
 - k. Ultraviolet Light Blocked (300-380 nanometers): > 99 percent

- 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, safety and security or anti-graffiti 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