

**LLumar® Anti-Graffiti Series**

Note: Click on "Show/Hide ¶" button to reveal "Specifier Notes" throughout section. Delete this text when editing is complete.

**PART 1 - GENERAL****1.1 CONDITIONS AND REQUIREMENTS**

- A. The General Conditions, Supplementary Conditions, and Division 01 – General Requirements apply.

**1.2 SECTION INCLUDES**

- A. Anti-graffiti films
- B. [Insert item description.]

**1.3 RELATED SECTIONS**

- A. Section 08 80 00 - Glazing: Substrate for application of anti-graffiti film.
- B. Section [xxxxx] – [Section Title]: [Include brief description of work specified in another section that is related to the work of this section.]

**1.4 REFERENCES**

- A. ASTM International (ASTM):
  - 1. ASTM E903 - Test Method for Solar Absorptance, Reflectance, and Transmittance of Materials Using Integrating Spheres.

**1.5 DEFINITIONS**

- A. Emissivity: The ability of a surface to absorb far-infrared heat and to reflect it. The lower the emissivity, the lower the far-infrared heat absorption and the greater the far-infrared heat reflectance.
- B. Far-Infrared Heat: Heat radiated from objects at temperatures below 1300 degrees F such as heat radiated from: room objects, objects heated by the sun, or a home heating system. Far-infrared heat is different from near-infrared heat that is heat radiated from objects at highly elevated temperatures such as the sun.
- C. Light to Solar Heat Gain Ratio: Ratio of visible light transmission to Solar Heat Gain Coefficient for a glazing system.
- D. Solar Heat Gain Coefficient (SHGC): The fraction of incident solar radiation that actually passes through that window, including solar energy that is both directly transmitted and that which is absorbed and subsequently released inwardly by re-radiation and conduction. SHGC is expressed as a number between 0 and 1. The lower a window's SHGC, the less solar heat it transmits. This number is the mathematical complement of the Total Solar Energy Rejection

(TSER) value: The sum of the TSER (in decimal form) of a glazing system and its SHGC value is 1; therefore,  $1 - \text{TSER} = \text{SHGC}$ .

## 1.6 PERFORMANCE REQUIREMENTS

- A. Ultraviolet Transmission: Provide anti-graffiti films with UV absorbing materials that limit the weighted UV Transmission to less than [5.0] [1.0] percent when measured according to ASTM E903.
- B. Provide anti-graffiti films that do not have a masking sheet.

## 1.7 SUBMITTALS

- A. Submit under provisions of Section [01 33 00] [\_\_\_\_\_].
- B. Product Data: Submit for each product specified indicating:
  - 1. Performance properties.
  - 2. Preparation and installation instructions and recommendations.
  - 3. Storage and handling recommendations.
- C. Samples: For each type of safety-and-security film specified, two (2) samples, 12 inches square.
- D. Qualification Data: Submit documentation indicating qualifications of safety-and-security film manufacturer.
- E. Operation and Maintenance Data: Submit for safety-and-security control film to include in maintenance manuals.
- F. Warranty: Submit sample special warranty specified in this section.

## 1.8 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified manufacturer that has a minimum of 10 years of documented experience manufacturing anti-graffiti films similar to be used for this project.
- B. Installer Qualifications: A firm that is authorized by anti-graffiti film manufacturer to install film in accordance with guidelines set forth by the manufacturer.
- C. Source Limitations: Obtain each type of anti-graffiti film from same manufacturer.
- D. Mock-ups: Build mock-ups to verify selections made under sample submittals and to evaluate surface preparation techniques and application workmanship.
  - 1. Construct mock-ups in the location and of the size indicated or, if not indicated, as directed by Architect.
  - 2. Approved mock-ups may become part of the completed work if undisturbed at time of Substantial Completion.
- E. Pre-installation Conference: Conduct conference at project site to discuss methods and procedures relating to installation of the anti-graffiti films.

## 1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store and handle materials in manufacturer's protective packaging.
- B. Store and protect materials according to manufacturer's written recommendations to prevent damage from condensation, temperature changes, direct exposure to sun, or other causes.

## 1.10 SITE CONDITIONS

- A. Ambient Conditions: Maintain temperature, humidity, and ventilation within limits recommended by manufacturer.

## 1.11 LIMITED WARRANTY

- A. Manufacturer's Limited Warranty: Certain restrictions apply. The Manufacturer's Limited Warranty can be viewed in full by [clicking here](#).

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Basis-of-Design Product: The design for anti-graffiti films is based on LLumar® Anti-Graffiti Films manufactured by an Eastman Chemical Company business: CPFilms Inc., 575 Maryville Centre Drive, St. Louis, Missouri 63141; Telephone: 800-255-8627; Email address: commercialalerts@eastman.com; Web Site: www.llumar.com.
- B. Representative: [Insert contact information.]
- C. Substitutions will be considered, subject to compliance with requirements of this section, under provisions of Section 01 60 00.

### 2.2 ANTI-GRAFFITI FILMS

- A. Anti-Graffiti Film: LLumar® GCLSRPS4 Anti-Graffiti Film with the following performance characteristics when applied to the interior surface of single-pane, 1/8-inch clear glass:

% Total Solar Transmittance	82
% Total Solar Reflectance	9
% Total Solar Absorptance	9
% Visible Light Transmission	89
% Visible Light Reflection - Exterior	9
% Visible Light Reflection – Interior	10
Winter U-Value	1.07
Shading Coefficient	0.97
% Ultraviolet Ray Protection (280nm-380nm)	97
Emissivity	0.90
Solar Heat Gain Coefficient	0.85
% Total Solar Energy Rejected	15
Light-to-Solar Heat Gain Ratio	1.05
% Summer Solar Heat Reduction	1
% Winter Heat Loss Reduction	-3
% Glare Reduction	1
Thickness without Liner	0.004 inches
Film Color	Clear

- B. Anti-Graffiti Film: LLumar® GCLSRPS6 Anti-Graffiti Film with the following performance characteristics when applied to the interior surface of single-pane, 1/8-inch clear glass:

% Total Solar Transmittance	81
% Total Solar Reflectance	9

% Total Solar Absorptance	10
% Visible Light Transmission	89
% Visible Light Reflection - Exterior	10
% Visible Light Reflection - Interior	10
Winter U-Value	1.07
Shading Coefficient	0.97
% Ultraviolet Ray Protection (280nm-380nm)	99
Emissivity	0.90
Solar Heat Gain Coefficient	0.84
% Total Solar Energy Rejected	16
Light-to-Solar Heat Gain Ratio	1.06
% Summer Solar Heat Reduction	2
% Winter Heat Loss Reduction	-3
% Glare Reduction	1
Thickness without Liner	0.006 inches
Film Color	Clear

### 2.3 ANTI-GRAFFITI FILM ACCESSORIES

- A. General: Provide accessories either manufactured by or acceptable to anti-graffiti film manufacturer for application indicated, and with a proven record of compatibility with surfaces contacted in installation.
- B. Adhesive: Water-activated, dry-adhesive system that forms a molecular bond between the film and glass. Protect adhesive from contamination by applying a release liner that will be removed and discarded at installation.
- C. Cleaners, Primers, and Sealers: Types recommended by anti-graffiti film manufacturer.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates for compliance with requirements and for conditions affecting performance of safety-and-security film including glass that is broken, chipped, cracked, abraded, or damaged in any way.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Comply with manufacturer's written instructions for surface preparation.
- B. Clean substrates thoroughly prior to installation.
- C. Prepare substrates using methods recommended by film manufacturer to achieve the best results for the substrate under project conditions.
- D. Protect window frames and surrounding surfaces to prevent damage during installation.

### 3.3 INSTALLATION

- A. Install in accordance with manufacturer's written instructions.
- B. Install with no gaps or overlaps.
- C. If seamed, make seams non-overlapping.

- D. Do not remove release liner from film until just before each piece of film is cut and ready for installation.
- E. Custom cut to the glass with neat, square corners and edges to within 1/8-inch of the window frame.
- F. Remove air bubbles, blisters, and other defects. Be careful to remove “fingers” to eliminate any contamination or excess water pockets. It is crucial to remove as much water as possible during installation.
- G. A final squeegee pass over the entire pane using a Blue Max Blade™ with an extended handle design (or Thor’s Hammer™) is recommended.

### 3.4 FIELD QUALITY CONTROL

- A. After installation, view film from a distance of 10 feet against a bright uniform sky or background. Film shall appear uniform in appearance with no visible streaks, wrinkles, banding, thin spots or pinholes.
- B. If installed film does not meet these criteria, remove and replace with new film.

### 3.5 CLEANING AND PROTECTION

- A. Remove excess mounting solution at finished seams, perimeter edges, and adjacent surfaces.
- B. Use cleaning methods recommended by safety-and-security film manufacturer.
- C. Replace films that cannot be cleaned.
- D. Protect installed products until completion of project.
- E. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

---

**EASTMAN**



**For inquiries inside the U.S. and Canada**

Eastman Chemical Company  
Advanced Materials - Performance Films  
P.O. Box 5068  
Martinsville, Virginia 24115  
1-800-2LLUMAR  
www.llumar.com

**For inquiries outside the U.S. and Canada**

Contact your regional technical services representative or visit [www.llumar.com](http://www.llumar.com).

© 2017 Eastman Chemical Company. LLumar, the LLumar logo, Vista, the Vista logo, EnerLogic, and the EnerLogic logo are trademarks of Eastman Chemical Company or one of its wholly owned subsidiaries. As used herein, ® denotes registered trademark status in the U.S. only. All other trademarks are the property of their respective owners. (03/17)