

**SOLAR CONTROL FILMS**  
**LLumar<sup>®</sup> Low-E 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. Solar control films.
- B. [Insert item description.]

**1.3 RELATED SECTIONS**

- A. Section 08 80 00 - Glazing: Substrate for application of solar control 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. 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.
- B. Low Emissivity (Low-E) Solar Control Films: Film products with improved far-infrared heat reflection, with the ability to reduce winter heat loss through windows. The reflection of far-infrared heat also reduces the need for summer cooling by reducing the transmission of far-infrared heat from outdoor objects through windows into the interior of a home or building.

## 1.6 PERFORMANCE REQUIREMENTS

- A. Ultraviolet Transmission: Provide solar control films with UV absorbing materials that limit the weighted UV Transmission to one (1) percent or less when measured according to ASTM E903.
- B. Provide solar control 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 solar control film specified, two (2) samples, 12 inches square.
- D. Qualification Data: Submit documentation indicating qualifications of solar control film manufacturer.
- E. Operation and Maintenance Data: Submit for solar 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 solar control films similar to be used for this project.
- B. Installer Qualifications: A firm that is authorized by solar control film manufacturer to install film in accordance with guidelines set forth by the manufacturer.
- C. Source Limitations: Obtain each type of solar control 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 solar control 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 Low-E solar control films is based on LLumar® Low-E Series Solar Control 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 SOLAR CONTROL FILMS**

- A. Solar Control Film: LLumar® Low-E E1220SRCDF Solar Control Film with the following performance characteristics when applied to the interior surface of single-pane, 1/4-inch clear glass:

% Total Solar Transmittance	8
% Total Solar Reflectance	49
% Total Solar Absorptance	43
% Visible Light Transmission	12
% Visible Light Reflection - Exterior	60
% Visible Light Reflection - Interior	66
Winter U-Value	0.78
Shading Coefficient	0.21
% Ultraviolet Ray Protection (280nm-380nm)	>99
Emissivity	0.38
Solar Heat Gain Coefficient	0.18
% Total Solar Energy Rejected	82
Light-to-Solar Heat Gain Ratio	0.67
% Summer Solar Heat Reduction	78
% Winter Heat Loss Reduction	24
% Glare Reduction	86
Thickness without Liner	42 μ
Film Color	Silver

- B. Solar Control Film: Vista™ by LLumar® Low-E Ambiance VE35SRCDF Solar Control Film with the following performance characteristics when applied to the interior surface of single-pane, 1/4-inch clear glass:

% Total Solar Transmittance	19
% Total Solar Reflectance	36
% Total Solar Absorptance	45
% Visible Light Transmission	28
% Visible Light Reflection - Exterior	35
% Visible Light Reflection - Interior	39
Winter U-Value	0.72
Shading Coefficient	0.33
% Ultraviolet Ray Protection (280nm-380nm)	>99
Emissivity	0.29
Solar Heat Gain Coefficient	0.28
% Total Solar Energy Rejected	72
Light-to-Solar Heat Gain Ratio	1.00
% Summer Solar Heat Reduction	66
% Winter Heat Loss Reduction	30
% Glare Reduction	68
Thickness without Liner	42 μ
Film Color	Neutral
NFRC Certification Number	CPF-K-037

- C. Solar Control Film: Vista™ by LLumar® Low-E Radiance VE50SRCDF Solar Control Film with the following performance characteristics when applied to the interior surface of single-pane, 1/4-inch clear glass:

% Total Solar Transmittance	34
% Total Solar Reflectance	27
% Total Solar Absorptance	39
% Visible Light Transmission	49
% Visible Light Reflection - Exterior	23
% Visible Light Reflection - Interior	26
Winter U-Value	0.79
Shading Coefficient	0.49
% Ultraviolet Ray Protection (280nm-380nm)	>99
Emissivity	0.41
Solar Heat Gain Coefficient	0.43
% Total Solar Energy Rejected	57
Light-to-Solar Heat Gain Ratio	1.14
% Summer Solar Heat Reduction	48
% Winter Heat Loss Reduction	23
% Glare Reduction	44
Thickness without Liner	42 μ
Film Color	Neutral
NFRC Certification Number	CPF-K-038

## 2.3 SOLAR CONTROL FILM ACCESSORIES

- D. General: Provide accessories either manufactured by or acceptable to solar control film manufacturer for application indicated, and with a proven record of compatibility with surfaces contacted in installation.
- E. 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.
- F. Cleaners, Primers, and Sealers: Types recommended by solar control film manufacturer.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates for compliance with requirements and for conditions affecting performance of solar control 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. Use Film-On or baby shampoo for the application.
- 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.

### 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 solar control 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

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**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).

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