

SOLAR CONTROL FILMS

# LLumar<sup>®</sup> Specialty Series

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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. Specialty films: Provide virtually invisible appearance, energy savings, aesthetics of high visible light transmission.
- B. Light-to-Solar Heat Gain Ratio: Ratio of visible light transmission to solar heat gain coefficient for a glazing system.
- C. Visible Light Transmission: the ratio of the amount of total visible solar energy (380-780nm) that is allowed to pass through a glazing system to the amount of total visible solar energy falling on the glazing system. The value is expressed as a percentage and is photopically weighted to account for the greater sensitivity of the human eye to the center region of the visible spectrum.

## 1.6 PERFORMANCE REQUIREMENTS

- A. Ultraviolet Transmission: Provide solar control films with UV absorbing materials that limit the weighted UV Transmission to less than one (1) percent 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 specialty solar control films is based on LLumar® Specialty 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® Specialty AIR80BLSRHPR (Clear) 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	39
% Total Solar Reflectance	6
% Total Solar Absorptance	55
% Visible Light Transmission	76
% Visible Light Reflection - Exterior	8
% Visible Light Reflection - Interior	8
Winter U-Value	1.05
Shading Coefficient	0.65
% Ultraviolet Ray Protection (280nm-380nm)	>99
Emissivity	0.89
Solar Heat Gain Coefficient	0.56
% Total Solar Energy Rejected	44
Light-to-Solar Heat Gain Ratio	1.36
% Summer Solar Heat Reduction	32
% Winter Heat Loss Reduction	-2
% Glare Reduction	14
Thickness without Liner	42 μ
Film Color	Clear

- B. Solar Control Film: LLumar® Specialty AU85UVSRHPR (UVCL – Clear) 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	75
% Total Solar Reflectance	8
% Total Solar Absorptance	17
% Visible Light Transmission	87
% Visible Light Reflection - Exterior	10

% Visible Light Reflection - Interior	10
Winter U-Value	1.06
Shading Coefficient	0.92
% Total Solar Energy Rejected	>99
Emissivity	0.90
Solar Heat Gain Coefficient	0.80
% Ultraviolet Ray Protection (280nm-380nm)	20
Light-to-Solar Heat Gain Ratio	1.09
% Summer Solar Heat Reduction	2
% Winter Heat Loss Reduction	-3
% Glare Reduction	1
Thickness without Liner	42 $\mu$
Film Color	Clear

### 2.3 SOLAR CONTROL FILM ACCESSORIES

- A. 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.
- B. Adhesive: Films with a HRP designation utilize a pressure sensitive adhesive which is activated by pressure and water. It is characterized by its permanently tacky nature and its installation ease. 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 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 a manufacturer-recommended solution 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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