

Guide Specifications

Section 08 87 13

SOLAR CONTROL FILMS **LLumar[®] Ceramic 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 RELATED DOCUMENTS

- 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 D1044 - Test for Resistance of Transparent Plastics to Surface Abrasion (Taber Abrader Test).
 - 2. ASTM E903 - Test Method for Solar Absorptance, Reflectance, and Transmittance of Materials Using Integrating Spheres.

1.5 DEFINITIONS

- A. Ceramic Solar Control Films: Film products that are corrosion-resistant without use of edge sealants and that have minimal visible light reflectance in the visible range from 380 to 780 nanometers.

1.6 PERFORMANCE REQUIREMENTS

- A. Scratch Resistance: Ceramic solar control films shall average less than 12 percent increase in haze when tested according to ASTM D1044 using a Teledyne Taber Abrader using CS-T3 wheels each loaded to 0.5 kg for 100 cycles in a 70 percent vacuum.
- B. Scratch resistance testing shall be performed by an independent third party agency.
- C. Ultraviolet Transmission: Provide solar control films with UV absorbing materials that limit the weighted UV Transmission to less than 0.1 percent when measured according to ASTM E903.

- D. 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.
- 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. Mockups: Build mockups to verify selections made under sample submittals and to evaluate surface preparation techniques and application workmanship.
 - 1. Construct mockups in the location and of the size indicated or, if not indicated, as directed by architect.
 - 2. Approved mockups 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 ceramic solar control films is based on Vista™ by LLumar® Ceramic Series Solar Control Films manufactured by an Eastman Chemical Company business: CPFilms Inc., 575 Maryville Centre Drive, St. Louis, Missouri 63141; telephone: 800-345-6088; Email: commercialalerts@eastman.com; Web Site: www.vista-films.com.
- B. Substitutions will not be considered.
- 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: Ceramic 35 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	24
% Total Solar Reflectance	11
% Total Solar Absorptance	65
% Visible Light Transmission	35
% Visible Light Reflection - Exterior	10
% Visible Light Reflection - Interior	10
Winter U-Value	1.04
Shading Coefficient	0.52
% Ultraviolet Ray Protection (280nm-380nm)	99
Emissivity	0.88
Solar Heat Gain Coefficient	0.45
% Total Solar Energy Rejected	55
Light-to-Solar Heat Gain Ratio	0.78
% Summer Solar Heat Reduction	45
% Winter Heat Loss Reduction	-1
% Glare Reduction	60
Film Color	Neutral

- B. Solar Control Film: Ceramic 45 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	35
% Total Solar Reflectance	8
% Total Solar Absorptance	57
% Visible Light Transmission	48
% Visible Light Reflection - Exterior	8
% Visible Light Reflection - Interior	9
Winter U-Value	1.05
Shading Coefficient	0.62
% Ultraviolet Ray Protection (280nm-380nm)	99
Emissivity	0.90
Solar Heat Gain Coefficient	0.53

% Total Solar Energy Rejected	47
Light-to-Solar Heat Gain Ratio	0.91
% Summer Solar Heat Reduction	35
% Winter Heat Loss Reduction	-2
% Glare Reduction	45
Film Color	Neutral

- C. Solar Control Film: Ceramic 55 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	42
% Total Solar Reflectance	10
% Total Solar Absorptance	48
% Visible Light Transmission	56
% Visible Light Reflection - Exterior	9
% Visible Light Reflection - Interior	11
Winter U-Value	1.04
Shading Coefficient	0.67
% Ultraviolet Ray Protection (280nm-380nm)	99
Emissivity	0.88
Solar Heat Gain Coefficient	0.58
% Total Solar Energy Rejected	42
Light-to-Solar Heat Gain Ratio	0.97
% Summer Solar Heat Reduction	29
% Winter Heat Loss Reduction	-1
% Glare Reduction	36
Film Color	Neutral

- D. Solar Control Film: Ceramic 65 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	52
% Total Solar Reflectance	8
% Total Solar Absorptance	40
% Visible Light Transmission	65
% Visible Light Reflection - Exterior	8
% Visible Light Reflection - Interior	10
Winter U-Value	1.05
Shading Coefficient	0.75
% Ultraviolet Ray Protection (280nm-380nm)	99
Emissivity	0.89
Solar Heat Gain Coefficient	0.64
% Total Solar Energy Rejected	36
Light-to-Solar Heat Gain Ratio	1.02
% Summer Solar Heat Reduction	22
% Winter Heat Loss Reduction	-2
% Glare Reduction	26
Film Color	Neutral

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: Pressure-sensitive adhesive system. 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 film continuously, but not necessarily in one (1) continuous length. 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. Install film with mounting solution and custom cut to the glass with neat, square corners and edges to within 1/8-inch of 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™ 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 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

EASTMAN



For inquiries inside the U.S. and Canada

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For inquiries outside the U.S. and Canada

Contact your regional technical services
representative or visit www.llumar.com.

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