ENERLOGIC SERIES GUIDE SPECIFICATIONS

SECTION 08 87 13

SOLAR CONTROL FILMS

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 [xxxxxx] – [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.

B. National Fenestration Rating Council, Inc. (NFRC):
   1. NFRC 302 - Optical Spectral Data Verification Program.

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 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. Low Emissivity (Low-E) Films: Films 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.

E. Spectrally Selective Solar Control Films: Film products that reduce solar heat gain mainly by reducing the transmission of near-infrared solar radiation with minimal reduction of visible light transmission. Films with a light to solar heat gain ratio of above 1.00 are spectrally selective.

1.6 PERFORMANCE REQUIREMENTS

A. Scratch Resistance: Solar control films shall average less than 12 percent increase in haze when tested according to ASTM D1044 using a Teledyne Taber Abrader using CS10F Type III wheels each loaded to 0.5 kg for 100 cycles in a 70 percent vacuum.

B. Scratch resistance and emissivity 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 1.0 percent when measured according to ASTM E903.

D. Provide solar control films that do not have a masking sheet.

E. Product Standard: Comply with NFRC 302 for window film energy performance ratings.
   1. Window Film Energy Performance Certification: NFRC certified with label attached to each product package.

1.7 SUBMITTALS

A. Submit under provisions of Section [01 33 00] [_____].

B. Product Data: Submit for each product specified indicating:
   1. Physical and 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 [40] [_____] years of documented experience manufacturing solar control films similar to that 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. 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. Preinstallation 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 WARRANTY

A. Manufacturer's Warranty: Manufacturer's standard form in which manufacturer agrees to replace films that fail within specified warranty period.
   1. Warranty Period: [15] [Insert number] years from date of original installation.

2. Warranty coverage limited to owner of property at time of installation.
3. Manufacturer's obligation is limited to furnishing replacement film for any film covered by limited warranty which manufacturer determines to be defective. Manufacturer will not be liable for installation costs of replacement film or for any special, indirect, incidental or consequential damages.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Product: EnerLogic Window Films manufactured by Solutia Inc. Performance Films Division, P.O. Box 5068, Martinsville, VA 24115; telephone: 800-255-8627; Email: Vista-films@cpfilms.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 25 00.

2.2 SOLAR CONTROL FILMS

A. Solar Control Film: Vista EnerLogic 35 Low-E Solar Control Film (VEP35SRCDF) with the following performance characteristics when applied to the interior surface of single-pane, 3-mm clear glass:
1. Total Solar Transmittance: 19 percent.
2. Total Solar Reflectance: 49 percent.
3. Total Solar Absorptance: 32 percent.
4. Visible Light Transmission: 33 percent.
5. Visible Light Reflection - Exterior: 48 percent.
6. Visible Light Reflection - Interior: 30 percent.
7. U-Value, Winter Median: 0.60.
8. Shading Coefficient: 0.28.
9. Total Solar Energy Rejected (TSER): 76 percent.
10. Emissivity: 0.07.
11. Solar Heat Gain Coefficient (SHGC): 0.24.
12. Ultraviolet Rejection: 99 percent.
13. Light-to-Solar Heat Gain Ratio (LSG): 1.38.
14. Winter Heat Loss Reduction: 42 percent.
15. Summer Solar Heat Gain Reduction: 72 percent.
16. Glare Reduction: 63 percent.
17. Thickness without Liner: 60µ.
18. Film Color: Warm neutral.
19. NFRC Certification No.: CPF-K-049.

B. Solar Control Film: Vista EnerLogic 70 Low-E Solar Control Film (VEP70SRCDF) with the following performance characteristics when applied to the interior surface of single-pane, 3-mm clear glass:

[redacted] [redacted]

1. Total Solar Transmittance: 46 percent.
2. Total Solar Reflectance: 21 percent.
3. Total Solar Absorptance: 33 percent.
4. Visible Light Transmission: 70 percent.
5. Visible Light Reflection - Exterior: 8 percent.
6. Visible Light Reflection - Interior: 4 percent.
7. U-Value, Winter Median: 0.61.
8. Shading Coefficient: 0.59.
9. Total Solar Energy Rejected (TSER): 49 percent.
10. Emissivity: 0.09.
11. Solar Heat Gain Coefficient (SHGC): 0.51.
12. Ultraviolet Rejection: 99 percent.
13. Light-to-Solar Heat Gain Ratio (LSG): 1.37.
14. Winter Heat Loss Reduction: 41 percent.
15. Summer Solar Heat Gain Reduction: 41 percent.
16. Glare Reduction: 22 percent.
17. Thickness without Liner: 60µ.
18. Film Color: Warm neutral.
19. NFRC Certification No.: CPF-K-050.

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: 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 solar control film manufacturer.

D. Edge Sealant: [No edge sealant required] [Edge sealant required if within 10 kilometers (5-7 miles) of the ocean or other large body of salt water. Dow Corning 795 Clear Silicone Sealant, SpectraSeal, or similar neutral cure silicone sealant acceptable to 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.

[redacted] [redacted]

3.2 PREPARATION

A. Comply with manufacturer's written instructions for surface preparation.

B. Clean substrates thoroughly prior to installation. Provide additional scrubbing of perimeter area with X-100 solution.

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. [No edge sealant required.] [Edge seal interior solar control films with a neutral cure silicone sealant within 10km of the ocean. Use an interior type silicone sealant with good adhesion to plastics and glass.]

C. Install film continuously, but not necessarily in one (1) continuous length. Install with no gaps or overlaps.

D. If seamed, make seams non-overlapping. [No seam sealant required.] [Seal with a 0.25-inch wide band of seam sealant in accordance with sealant manufacturer's instructions if within 10km of the ocean.]

E. Do not remove release liner from film until just before each piece of film is cut and ready for installation.

F. Custom cut to the glass with neat, square corners and edges to within 1/8-inch of the window frame. [Use X-100 solution for the application.] [Install film with Film-On mounting solution and purified water. X-100 solution should never be used as the application solution for any reason.]

G. 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.

H. 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 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