

SECTION 08 87 13
WINDOW FILM

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1.GENERAL

1.1. SECTION INCLUDES

- A. Sun Control Window Film:
 - 1. Clear microlayered film. (Prestige 70) (Prestige 60) (Prestige 50) (Prestige 40) (Prestige 20)

1.2. RELATED SECTIONS

- A. Section 08 54 13 - Fiberglass Windows.
- B. Section 08 60 00 - Roof Windows and Skylights.
- C. Section 08 83 13 - Mirrored Glass Glazing.
- D. Section 08 44 23 - Structural Sealant Glazed Curtain Wall.

1.3. REFERENCES

- A. ASHRAE - American Society for Heating, Refrigeration, and Air Conditioning Engineers; Handbook of Fundamentals.
- B. ASTM International (ASTM):
 - 1. ASTM E 84 - Standard Method of Test for Surface Burning Characteristics of Building Materials.
 - 2. ASTM E 308 - Standard Recommended Practice for Spectrophotometry and Description of Color in CIE 1931 System.
 - 3. ASTM E 903 - Standard Methods of Test for Solar Absorbance, Reflectance and Transmittance of Materials Using Integrating Spheres.
- C. NFRC 100/200 (Formerly ASTM E903) - Standard Methods of Test for Solar Absorbance, Reflectance and Transmittance of Materials Using Integrating Spheres.
- D. Window 6.3 - A Computer Tool for Analyzing Window Thermal Performance; Lawrence Berkeley Laboratory.

1.4. DEFINITIONS

- A. Light to Solar Gain Ratio: The ratio of visible light transmission to Solar Heat Gain Coefficient.

1.5. PERFORMANCE REQUIREMENTS

- A. Flammability: Surface burning characteristics when tested in accordance ASTM E 84, demonstrating film applied to glass rated Class A for Interior Use:

1. Flame Spread Index: no greater than 25.
2. Smoke Developed Index: no greater than 55.

1.6. SUBMITTALS

- A. Submit under provisions of Section 01 30 00 - Administrative Requirements.
- B. Product Data: Manufacturer's current technical literature on each product to be used, including:
1. Manufacturer's Data Sheets.
 2. Preparation instructions and recommendations.
 3. Storage and handling requirements and recommendations.
 4. Installation methods.

- C. Verification Samples: For each film specified, two samples representing actual film color and pattern.
- D. Performance Submittals: Provide laboratory data of emissivity and calculated window U-Factors for various outdoor temperatures based upon established calculation procedure defined by the ASHRAE Handbook of Fundamentals, Chapter 29, or Lawrence Berkeley Laboratory Window 5.2 Computer Program.

1.7. QUALITY ASSURANCE

- A. Manufacturer Qualifications: All primary products specified in this section will be supplied by a single manufacturer with a minimum of ten years experience.

1. Provide documentation that the adhesive used on the specified films is a Pressure Sensitive Adhesive (PSA).

- B. Installer Qualifications: All products listed in this section are to be installed by a single installer with a minimum of five years demonstrated experience in installing products of the same type and scope as specified.

1. Provide documentation that the installer is authorized by the Manufacturer to perform Work specified in this section.
2. Provide a commercial building reference list of 5 properties where the installer has applied window film. This list will include the following information:
 - a. Name of building.
 - b. The name and telephone number of a management contact.
 - c. Type of glass.
 - d. Type of film and/or film attachment system.
 - e. Amount of film and/or film attachment system installed.
 - f. Date of completion.
3. Provide an EFilm application analysis to determine available energy cost reduction and savings.

- C. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.

1. Finish areas designated by Architect.
2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.

3. Refinish mock-up area as required to produce acceptable work.

1.8. DELIVERY, STORAGE, AND HANDLING

- A. Follow Manufacturer's instructions for storage and handling.
- B. Store products in manufacturer's unopened packaging until ready for installation.
- C. Store and dispose of hazardous materials, and materials contaminated by hazardous materials, in accordance with requirements of local authorities having jurisdiction.

1.9. PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

1.10. WARRANTY

- A. At project closeout, provide to Owner or Owners Representative an executed current copy of the manufacturer's standard limited warranty against manufacturing defect, outlining its terms, conditions, and exclusions from coverage.

2. PRODUCTS

2.1. MANUFACTURERS

- A. Acceptable Manufacturer: 3M Window Film , which is located at: 3M Center Bldg. 0235-02-S-27; St. Paul, MN 55144-1000; Toll Free Tel: 866-499-8857; Tel: 651-737-0196; Fax: 651-737-3446; Email:[request info \(jwtaapl@mmm.com\)](mailto:request_info@jwtaapl@mmm.com); Web:www.3m.com/windowfilm
- B. Substitutions: Not permitted.

2.2. 3M PRESTIGE SUN CONTROL FILM

- A. Physical Properties:
 1. Composition: Optically clear polyester film containing at least 220 layers and incorporating pressure sensitive adhesive on one side and an acrylic abrasion resistant coating on the other. Nanotechnology represents a breakthrough in technology due to the enhanced heat, UV and IR rejection, without the presence of any metals. The film does not contain dyes.
 2. Uniformity: No noticeable pin holes, streaks, thin spots, scratches, banding or other optical defects.
 3. Variation in Total Transmission across the Width: Less than 2 percent over the average at any portion along the length.
 4. Thickness: Nominal 2.0 mils (0.1mm) with no evidence of coating voids.
 5. Identification: Labeled as to Manufacturer as listed in this Section.
- B. Performance, Prestige 20 - Lightly Tinted Film, nanotechnology, no metal and at least 220 plus layers applied to 1/4 Inch (6.4 mm) Thick Clear Glass:
 1. Visible Light Transmission (NFRC 100/200): 21 percent.
 2. Visible Reflection - Exterior (NFRC 100/200): 6 percent.
 3. Visible Reflection - Interior (NFRC 100/200): 5 percent.
 4. Ultraviolet Rejected (NFRC 100/200): 99.9 percent.
 5. Infrared Energy Rejected (NFRC 100/200): Up to 97 percent; as measured between 900-1000 nm.
 6. Light to Solar Gain Ratio: 0.6.
 7. Solar Heat Gain Coefficient at 90 Degrees (Normal Incidence) (NFRC 100/200): 0.38.
 8. Total Solar Energy Rejected (TSER) at 90 Degrees (Normal Incidence) (NFRC

- 100/200): 62 percent.
9. Total Solar Energy Rejected (TSER) at 65 Degrees (NFRC 100/200): 66 percent.

3.EXECUTION

3.1. EXAMINATION

- A. Film Examination:
1. If preparation of glass surfaces is the responsibility of another installer, notify Architect in writing of deviations from manufacturer's recommended installation tolerances and conditions.
 - a. Glass surfaces receiving new film should first be examined to verify that they are free from defects and imperfections, which will affect the final appearance.
 2. Do not proceed with installation until glass surfaces have been properly prepared and deviations from manufacturer's recommended tolerances are corrected. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result under the project conditions.
 3. Commencement of installation constitutes acceptance of conditions.

3.2. PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Refer to Manufacturer's installation instructions for methods of preparation for Impact Protection Adhesive or Impact Protection Profile film attachment systems.

3.3. INSTALLATION

- A. Film Installation, General:
1. Install in accordance with manufacturer's instructions.
 2. Cut film edges neatly and square at a uniform distance of 1/8 inch (3 mm) to 1/16 inch (1.5 mm) of window sealant. Use new blade tips after 3 to 4 cuts.
 3. Spray the slip solution, composed of one capful of baby shampoo or dishwashing liquid to 1 gallon of water, on window glass and adhesive to facilitate proper positioning of film.
 4. Apply film to glass and lightly spray film with slip solution.
 5. Squeegee from top to bottom of window. Spray slip solution to film and squeegee a second time.
 6. Bump film edge with lint-free towel wrapped around edge of a 5-way tool.
 7. Upon completion of film application, allow 30 days for moisture from film installation to dry thoroughly, and to allow film to dry flat with no moisture dimples when viewed under normal viewing conditions.
 8. If completing an exterior application, check with the manufacturer as to whether edge sealing is required.

3.4. CLEANING AND PROTECTION

- A. Remove left over material and debris from Work area. Use necessary means to protect film before, during, and after installation.
- B. Touch-up, repair or replace damaged products before Substantial Completion.
- C. After application of film, wash film using common window cleaning solutions, including ammonia solutions, 30 days after application. Do not use abrasive type cleaning agents and bristle brushes to avoid scratching film. Use synthetic sponges or soft cloths.

END OF SECTION