



SECTION 08 87 33
ARCHITECTURAL WINDOW FILM

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PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Architectural Window Film of the Following Types:
1. Combination patterned film (Fasara). (Illumina Glace) (Illumina Glace 2)
 2. Single patterned film (Fasara). (Mat Crystal) (Milky White) (Milky Milky)
 3. Gradation pattern film (Fasara). (Illumina) (Illumina-g) (Illumina-P) (Illumina Silver) (Illumina Black) (Aerina) (Venetian) (Robe) (Lontano) (Sabrina) (Tsurugi)
 4. Stripe pattern film (Fasara). (Nokto) (Radius) (Shutie) (Shutie Black) (Arpa) (Arpa Black) (Seattle) (Seattle Fine) (Fine)
 5. Border/Horizontal pattern film (Fasara). (Lattice) (Lattice-g) (Slat) (Slat-g) (Pixela) (Paracell) (Leise)
 6. Prism/Dot pattern film (Fasara). (Prism Noir) (Prism Silver) (Astral Silver) (Cielo) (Luna 6) (Luna 9) (Aura 9) (Vista) (SHIZUKU) (KANON)
 7. Fabric/Japan Paper pattern film (Fasara). (Linen) (Altair) (Vega) (SAGANO) (SAFU) (YAMOTO) (KEN-UN) (RIKYU)
 8. Frost/Matte and Mirror pattern film (Fasara). (ESSEN) (LAUSANNE) (OSLO) (OSLO-P) (CHAMONIX) (Opaque White) (Fine Crystal) (Luce) (Mat Crystal-1) (Mat Crystal 2) (Milky White (Milano)) (Milky Milky (San Marino)) (Glace) (Milky Crystal) (Mare) (Opaque Black) (Silver 1)
 9. Single patterned film (3M CRYSTAL Glass Finishes). (Dusted) (Frosted).
 10. Decorative Pattern: Custom-Printed per project (by other than Manufacturer) (3M Decorative Polyester Glass Finish Film).
 11. Transmissive/Reflective Color Pattern: 3M DICHROIC DF-PA Film. (Blaze) (Chill).

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.

1.4 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 450.

1.5 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.

1.6 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.
- 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.
- 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.

1.7 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.

1.8 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.

1.9 WARRANTY

- A. At project closeout, provide to Owner or Owner's Representative an executed current copy of the manufacturer's standard limited warranty against manufacturing defect, outlining its terms, conditions, and exclusions from coverage.
- B. In order to validate warranty, installation must be performed by an Authorized 3M dealer and according to Manufacturer's installation instructions. Verification of Authorized 3M dealer can be confirmed by submission of active 3M dealer code number.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: 3M Company, 3M Commercial Solutions Division, which is located at: 3M Center Bldg. 220-12-E-04; St. Paul, MN 55144-1000
- B. Purchased through Energy Products Distribution, www.epdwindowfilm.com, Contact Manny Hondroulis at rhondroulis@epdwindowfilm.com or 1-800-537-3911
- C. Substitutions: Not permitted.

2.2 COMBINATION PATTERNED FILM

- A. Fasara - Illumina Glace Decorative / Privacy Glazing Film:
 - 1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
 - 2. Visible Light Transmission (ASTM E 903, ASTM E 308): Not more than 49 percent.
 - 3. Visible Light Rejected (ASTM E 903): Not less than 19 percent.
 - 4. Solar Heat Reduction: Not less than 14 percent.
 - 5. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): Not less than 0.62.
- B. Fasara - Illumina Glace Decorative / Privacy Glazing Film:
 - 1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
 - 2. Visible Light Transmission (ASTM E 903, ASTM E 308): Not more than 63 percent.
 - 3. Visible Light Rejected (ASTM E 903): Not less than 13 percent.
 - 4. Solar Heat Reduction: Not less than 11 percent.
 - 5. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): Not less than 0.74.

2.3 LINE PATTERNED FILM

- A. Fasara - Fine Decorative / Privacy Glazing Film:
 - 1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
 - 2. Visible Light Transmission (ASTM E 903, ASTM E 308): Not more than 46 percent.
 - 3. Visible Light Rejected (ASTM E 903): Not less than 25 percent.
 - 4. Solar Heat Reduction: Not less than 19 percent.
 - 5. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): Not less than 0.62.

- B. Fasara - Lattice Glace Decorative / Privacy Glazing Film:
 1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
 2. Visible Light Transmission (ASTM E 903, ASTM E 308): Not more than 57 percent.
 3. Visible Light Rejected (ASTM E 903): Not less than 13 percent.
 4. Solar Heat Reduction: Not less than 11 percent.
 5. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): Not less than 0.71.

- C. Fasara - Slat Glace Decorative / Privacy Glazing Film:
 1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
 2. Visible Light Transmission (ASTM E 903, ASTM E 308): Not more than 53 percent.
 3. Visible Light Rejected (ASTM E 903): Not less than 15 percent.
 4. Solar Heat Reduction: Not less than 12 percent.
 5. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): Not less than 0.68.

2.4 SINGLE PATTERNED FILM

- A. Fasara - Mat Crystal I Decorative / Privacy Glazing Film:
 1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
 2. Visible Light Transmission (ASTM E 903, ASTM E 308): Not more than 83 percent.
 3. Visible Light Rejected (ASTM E 903): Not less than 8 percent.
 4. Solar Heat Reduction: Not less than 8 percent.
 5. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): Not less than 0.91.

- B. Fasara - Milky White Decorative / Privacy Glazing Film:
 1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
 2. Visible Light Transmission (ASTM E 903, ASTM E 308): Not more than 59 percent.
 3. Visible Light Rejected (ASTM E 903): Not less than 17 percent.
 4. Solar Heat Reduction: Not less than 21 percent.
 5. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): Not less than 0.75.

- C. Fasara - Milky Milky Decorative / Privacy Glazing Film:
 1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
 2. Visible Light Transmission (ASTM E 903, ASTM E 308): Not more than 28 percent.
 3. Visible Light Rejected (ASTM E 903): Not less than 27 percent.
 4. Solar Heat Reduction: Not less than 42 percent.
 5. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): Not less than 0.55.

2.5 ARCHITECTURAL FINISH FILMS

- A. Architectural Finish Films: 3M FASARA Glass Finishes Film as manufactured by 3M Company - Commercial Solutions.

- B. Material Properties:
 1. General: Glass and plastic finishes field-applied application to glass or plastic material as visual opaque or decorative film.
 2. Film: Polyester.
 3. Decorative Pattern: Printed.
 4. Adhesive: Acrylic, Pressure Sensitive, Permanent.
 5. Liner: Silicone-coated Polyester.
 6. Thickness (Average): 3.2 mils (80 microns).
 7. Fire Performance: Surface burning characteristics when tested in accordance with ASTM E84: Class A:

- a. Flame Spread: 25 maximum.
 - b. Smoke Developed: 450 maximum.
- C. Optical Performance: Gradation Series.
1. FASARA - Illumina Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
 - a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 51 percent.
 - c. Visible Light Reflectance - Interior - Interior: 20 percent.
 - d. Solar Heat Transmittance: 53 percent.
 - e. Solar Heat Reflectance: 20 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.72.
 2. FASARA - Illumina-g Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
 - a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 66 percent.
 - c. Visible Light Reflectance - Interior: 14 percent.
 - d. Solar Heat Transmittance: 1 percent.
 - e. Solar Heat Reflectance: 13 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.83.
 3. FASARA - Illumina-P Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
 - a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 66 percent.
 - c. Visible Light Reflectance - Interior: 14 percent.
 - d. Solar Heat Transmittance: 53 percent.
 - e. Solar Heat Reflectance: 13 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.83.
 4. FASARA - Illumina Silver Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
 - a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 36 percent.
 - c. Visible Light Reflectance - Interior: 59 percent.
 - d. Solar Heat Transmittance: 33 percent.
 - e. Solar Heat Reflectance: 50 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.44.
 5. FASARA - Illumina Black Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
 - a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 20 percent.
 - c. Visible Light Reflectance - Interior: 6 percent.
 - d. Solar Heat Transmittance: 19 percent.
 - e. Solar Heat Reflectance: 6 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.79.
 6. FASARA - Aerina Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
 - a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 79 percent.
 - c. Visible Light Reflectance - Interior: 13 percent.
 - d. Solar Heat Transmittance: 76 percent.
 - e. Solar Heat Reflectance: 12 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.91.
 7. FASARA - Venetian Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
 - a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 54 percent.

- c. Visible Light Reflectance - Interior: 23 percent.
 - d. Solar Heat Transmittance: 55 percent.
 - e. Solar Heat Reflectance: 18 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.73.
8. FASARA - Robe Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
- a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 35 percent.
 - c. Visible Light Reflectance - Interior: 31 percent.
 - d. Solar Heat Transmittance: 39 percent.
 - e. Solar Heat Reflectance: 23 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.59.
9. FASARA - Lontano Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
- a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 61 percent.
 - c. Visible Light Reflectance - Interior: 22 percent.
 - d. Solar Heat Transmittance: 57 percent.
 - e. Solar Heat Reflectance: 20 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.74.
10. FASARA - Sabrina Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
- a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 83 percent.
 - c. Visible Light Reflectance - Interior: 10 percent.
 - d. Solar Heat Transmittance: 77 percent.
 - e. Solar Heat Reflectance: 9 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.93.
11. FASARA - Tsurugi Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
- a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 61 percent.
 - c. Visible Light Reflectance - Interior: 21 percent.
 - d. Solar Heat Transmittance: 58 percent.
 - e. Solar Heat Reflectance: 19 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.75.
- D. Optical Performance: Stripe Series.
1. FASARA - Nokto Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
- a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 13 percent.
 - c. Visible Light Reflectance - Interior: 7 percent.
 - d. Solar Heat Transmittance: 12 percent.
 - e. Solar Heat Reflectance: 7 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.44.
2. FASARA - Radius Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
- a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 6 percent.
 - c. Visible Light Reflectance - Interior: 7 percent.
 - d. Solar Heat Transmittance: 7 percent.
 - e. Solar Heat Reflectance: 7 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.40.
3. FASARA - Shutie Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):

- a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 59 percent.
 - c. Visible Light Reflectance - Interior: 22 percent.
 - d. Solar Heat Transmittance: 60 percent.
 - e. Solar Heat Reflectance: 17 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.77.
4. FASARA - Shutie Black Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
- a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 51 percent.
 - c. Visible Light Reflectance - Interior: 29 percent.
 - d. Solar Heat Transmittance: 53 percent.
 - e. Solar Heat Reflectance: 21 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.70.
5. FASARA - Arpa Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
- a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 67 percent.
 - c. Visible Light Reflectance - Interior: 22 percent.
 - d. Solar Heat Transmittance: 61 percent.
 - e. Solar Heat Reflectance: 17 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.78.
6. FASARA - Arpa Black Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
- a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 22 percent.
 - c. Visible Light Reflectance - Interior: 8 percent.
 - d. Solar Heat Transmittance: 25 percent.
 - e. Solar Heat Reflectance: 8 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.54.
7. FASARA - Seattle Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
- a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 74 percent.
 - c. Visible Light Reflectance - Interior: 22 percent.
 - d. Solar Heat Transmittance: 70 percent.
 - e. Solar Heat Reflectance: 16 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.85.
8. FASARA - Seattle Fine Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
- a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 68 percent.
 - c. Visible Light Reflectance - Interior: 25 percent.
 - d. Solar Heat Transmittance: 71 percent.
 - e. Solar Heat Reflectance: 16 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.85.
9. FASARA - Fine Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
- a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 48 percent.
 - c. Visible Light Reflectance - Interior: 27 percent.
 - d. Solar Heat Transmittance: 46 percent.
 - e. Solar Heat Reflectance: 22 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.65.

E. Optical Performance: Border/Horizontal Series.

1. FASARA - Lattice Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
 - a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 36 percent.
 - c. Visible Light Reflectance - Interior: 28 percent.
 - d. Solar Heat Transmittance: 41 percent.
 - e. Solar Heat Reflectance: 22 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.60.
2. FASARA - Lattice g Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
 - a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 60 percent.
 - c. Visible Light Reflectance - Interior: 14 percent.
 - d. Solar Heat Transmittance: 62 percent.
 - e. Solar Heat Reflectance: 13 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.80.
3. FASARA - Slat Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
 - a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 36 percent.
 - c. Visible Light Reflectance - Interior: 28 percent.
 - d. Solar Heat Transmittance: 41 percent.
 - e. Solar Heat Reflectance: 22 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.60.
4. FASARA - Slat g Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
 - a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 56 percent.
 - c. Visible Light Reflectance - Interior: 16 percent.
 - d. Solar Heat Transmittance: 58 percent.
 - e. Solar Heat Reflectance: 14 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.77.
5. FASARA - Pixela Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
 - a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 60 percent.
 - c. Visible Light Reflectance - Interior: 18 percent.
 - d. Solar Heat Transmittance: 62 percent.
 - e. Solar Heat Reflectance: 16 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.78.
6. FASARA - Paracell Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
 - a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 50 percent.
 - c. Visible Light Reflectance - Interior: 20 percent.
 - d. Solar Heat Transmittance: 53 percent.
 - e. Solar Heat Reflectance: 17 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.71.
7. FASARA - Leise Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
 - a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 88 percent.
 - c. Visible Light Reflectance - Interior: 9 percent.
 - d. Solar Heat Transmittance: 81 percent.
 - e. Solar Heat Reflectance: 9 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.96.

- F. Optical Performance: Prism/Dot Series.
1. FASARA - Prism Noir Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
 - a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 42 percent.
 - c. Visible Light Reflectance - Interior: 7 percent.
 - d. Solar Heat Transmittance: 42 percent.
 - e. Solar Heat Reflectance: 7 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.67.
 2. FASARA - Prism Silver Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
 - a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 53 percent.
 - c. Visible Light Reflectance - Interior: 31 percent.
 - d. Solar Heat Transmittance: 49 percent.
 - e. Solar Heat Reflectance: 28 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.64.
 3. FASARA - Astral Silver Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
 - a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 30 percent.
 - c. Visible Light Reflectance - Interior: 51 percent.
 - d. Solar Heat Transmittance: 28 percent.
 - e. Solar Heat Reflectance: 44 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.42.
 4. FASARA - Cielo Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
 - a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 56 percent.
 - c. Visible Light Reflectance - Interior: 26 percent.
 - d. Solar Heat Transmittance: 58 percent.
 - e. Solar Heat Reflectance: 19 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.74.
 5. FASARA - Luna 6 Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
 - a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 46 percent.
 - c. Visible Light Reflectance - Interior: 22 percent.
 - d. Solar Heat Transmittance: 48 percent.
 - e. Solar Heat Reflectance: 17 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.68.
 6. FASARA - Luna 9 Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
 - a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 39 percent.
 - c. Visible Light Reflectance - Interior: 24 percent.
 - d. Solar Heat Transmittance: 43 percent.
 - e. Solar Heat Reflectance: 19 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.63.
 7. FASARA - Aura 9 Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
 - a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 87 percent.
 - c. Visible Light Reflectance - Interior: 8 percent.
 - d. Solar Heat Transmittance: 89 percent.
 - e. Solar Heat Reflectance: 8 percent.

- f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.96.
 - 8. FASARA - Vista Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
 - a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 72 percent.
 - c. Visible Light Reflectance - Interior: 17 percent.
 - d. Solar Heat Transmittance: 67 percent.
 - e. Solar Heat Reflectance: 15 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.83.
 - 9. FASARA - SHIZUKU Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
 - a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 71 percent.
 - c. Visible Light Reflectance - Interior: 16 percent.
 - d. Solar Heat Transmittance: 68 percent.
 - e. Solar Heat Reflectance: 13 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.84.
 - 10. FASARA - KANON Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
 - a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 78 percent.
 - c. Visible Light Reflectance - Interior: 14 percent.
 - d. Solar Heat Transmittance: 73 percent.
 - e. Solar Heat Reflectance: 13 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.88.
- G. Optical Performance: Fabric/Japan Paper Series.
- 1. FASARA - Linen Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
 - a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 65 percent.
 - c. Visible Light Reflectance - Interior: 23 percent.
 - d. Solar Heat Transmittance: 73 percent.
 - e. Solar Heat Reflectance: 17 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.79.
 - 2. FASARA - Altair Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
 - a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 60 percent.
 - c. Visible Light Reflectance - Interior: 23 percent.
 - d. Solar Heat Transmittance: 60 percent.
 - e. Solar Heat Reflectance: 17 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.77.
 - 3. FASARA - Vega Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
 - a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 60 percent.
 - c. Visible Light Reflectance - Interior: 21 percent.
 - d. Solar Heat Transmittance: 60 percent.
 - e. Solar Heat Reflectance: 16 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.77.
 - 4. FASARA - SAGANO Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
 - a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 68 percent.
 - c. Visible Light Reflectance - Interior: 18 percent.

- d. Solar Heat Transmittance: 66 percent.
 - e. Solar Heat Reflectance: 14 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.83.
5. FASARA - SAFU Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
- a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 54 percent.
 - c. Visible Light Reflectance - Interior: 27 percent.
 - d. Solar Heat Transmittance: 54 percent.
 - e. Solar Heat Reflectance: 20 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.72.
6. FASARA - YAMATO Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
- a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 79 percent.
 - c. Visible Light Reflectance - Interior: 15 percent.
 - d. Solar Heat Transmittance: 74 percent.
 - e. Solar Heat Reflectance: 12 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.89.
7. FASARA - KEN-UN Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
- a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 51 percent.
 - c. Visible Light Reflectance - Interior: 28 percent.
 - d. Solar Heat Transmittance: 54 percent.
 - e. Solar Heat Reflectance: 21 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.40.
8. FASARA - RIKYU Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
- a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 72 percent.
 - c. Visible Light Reflectance - Interior: 8 percent.
 - d. Solar Heat Transmittance: 67 percent.
 - e. Solar Heat Reflectance: 7 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.86.
- H. Optical Performance: Frost/Matte and Mirror Series.
1. FASARA - ESSEN Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
- a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 55 percent.
 - c. Visible Light Reflectance - Interior: 26 percent.
 - d. Solar Heat Transmittance: 50 percent.
 - e. Solar Heat Reflectance: 23 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.67.
2. FASARA - LAUSANNE Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
- a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 84 percent.
 - c. Visible Light Reflectance - Interior: 9 percent.
 - d. Solar Heat Transmittance: 78 percent.
 - e. Solar Heat Reflectance: 8 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.94.
3. FASARA - OSLO Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
- a. Ultraviolet Transmittance: 0.1 percent.

- b. Visible Light Transmittance: 83 percent.
 - c. Visible Light Reflectance - Interior: 9 percent.
 - d. Solar Heat Transmittance: 76 percent.
 - e. Solar Heat Reflectance: 8 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.92.
4. FASARA - OSLO-P Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
- a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 83 percent.
 - c. Visible Light Reflectance - Interior: 9 percent.
 - d. Solar Heat Transmittance: 76 percent.
 - e. Solar Heat Reflectance: 8 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.92.
5. FASARA - CHAMONIX Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
- a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 47 percent.
 - c. Visible Light Reflectance - Interior: 35 percent.
 - d. Solar Heat Transmittance: 51 percent.
 - e. Solar Heat Reflectance: 26 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.67.
6. FASARA - Opaque White Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
- a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 10 percent.
 - c. Visible Light Reflectance - Interior: 57 percent.
 - d. Solar Heat Transmittance: 13 percent.
 - e. Solar Heat Reflectance: 46 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.30.
7. FASARA - Fine Crystal Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
- a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 84 percent.
 - c. Visible Light Reflectance - Interior: 9 percent.
 - d. Solar Heat Transmittance: 78 percent.
 - e. Solar Heat Reflectance: 8 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.94.
8. FASARA - Luce Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
- a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 34 percent.
 - c. Visible Light Reflectance - Interior: 31 percent.
 - d. Solar Heat Transmittance: 39 percent.
 - e. Solar Heat Reflectance: 23 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.59.
9. FASARA - Mat Crystal-i Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
- a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 85 percent.
 - c. Visible Light Reflectance - Interior: 9 percent.
 - d. Solar Heat Transmittance: 78 percent.
 - e. Solar Heat Reflectance: 8 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.94.
10. FASARA - Mat Crystal 2 Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
- a. Ultraviolet Transmittance: 0.1 percent.

- b. Visible Light Transmittance: 86 percent.
 - c. Visible Light Reflectance - Interior: 8 percent.
 - d. Solar Heat Transmittance: 79 percent.
 - e. Solar Heat Reflectance: 7 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.95.
11. FASARA - Milky White (Milano) Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
- a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 59 percent.
 - c. Visible Light Reflectance - Interior: 21 percent.
 - d. Solar Heat Transmittance: 57 percent.
 - e. Solar Heat Reflectance: 17 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.75.
12. FASARA - Milky Milky (San Marino) Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
- a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 21 percent.
 - c. Visible Light Reflectance - Interior: 43 percent.
 - d. Solar Heat Transmittance: 25 percent.
 - e. Solar Heat Reflectance: 34 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.44.
13. FASARA - Glace Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
- a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 56 percent.
 - c. Visible Light Reflectance - Interior: 18 percent.
 - d. Solar Heat Transmittance: 58 percent.
 - e. Solar Heat Reflectance: 14 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.77.
14. FASARA - Milky Crystal Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
- a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 19 percent.
 - c. Visible Light Reflectance - Interior: 42 percent.
 - d. Solar Heat Transmittance: 18 percent.
 - e. Solar Heat Reflectance: 31 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.40.
15. FASARA - Mare Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
- a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 78 percent.
 - c. Visible Light Reflectance - Interior: 10 percent.
 - d. Solar Heat Transmittance: 74 percent.
 - e. Solar Heat Reflectance: 9 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.91.
16. FASARA - Opaque Black Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
- a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 0.4 percent.
 - c. Visible Light Reflectance - Interior: 5 percent.
 - d. Solar Heat Transmittance: 1 percent.
 - e. Solar Heat Reflectance: 5 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.39.
17. FASARA - Silver 1 Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
- a. Ultraviolet Transmittance: 71 percent.

- b. Visible Light Transmittance: 0 percent.
- c. Visible Light Reflectance - Interior: 91 percent.
- d. Solar Heat Transmittance: 0 percent.
- e. Solar Heat Reflectance: 78 percent.
- f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.08.

2.6 ARCHITECTURAL FINISH FILMS

- A. Architectural Finish Films: 3M CRYSTAL Glass Finishes as manufactured by 3M Company - Commercial Solutions.
- B. Material Properties:
 - 1. General: Glass finishes field-applied application to glass or plastic material as visual opaque or decorative film.
 - 2. Film: Vinyl.
 - 3. Option to Electrocut (by other than Manufacturer).
 - 4. Adhesive: Acrylic, Pressure Sensitive, Permanent.
 - 5. Liner: Silicone-coated Polyester.
 - 6. Thickness (Film and Adhesive without Liner):
 - a. Dusted - 3.2 mils (81 microns).
 - b. Frosted - 4.7 mils (120 microns).
 - 7. Fire Performance: Surface burning characteristics when tested in accordance with ASTM E84, Class A:
 - a. Flame Spread: 25 maximum.
 - b. Smoke Developed: 450 maximum.
- C. Optical Performance:
 - 1. CRYSTAL Dusted Decorative / Privacy Glazing Film:
 - a. Ultraviolet Transmittance (ASTM E 903): 27 percent.
 - b. Visible Light Transmittance (ASTM E 903, ASTM E308): 85 percent.
 - c. Visible Light Reflectance (ASTM E 903): 79 percent.
 - d. Solar Heat Transmittance: 76 percent.
 - e. Solar Heat Reflectance: 7 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): 0.93.
 - 2. CRYSTAL Frosted Decorative / Privacy Glazing Film:
 - a. Ultraviolet Transmittance (ASTM E 903): 20 percent.
 - b. Visible Light Transmittance (ASTM E 903, ASTM E308): 72 percent.
 - c. Visible Light Reflectance (ASTM E 903): 12 percent.
 - d. Solar Heat Transmittance: 64 percent.
 - e. Solar Heat Reflectance: 10 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): 0.82.

2.7 ARCHITECTURAL FINISH FILMS

- A. Architectural Finish Films: 3M Decorative Polyester Glass Finish Film as manufactured by 3M Company - Commercial Solutions.
- B. Material Properties:
 - 1. General: Glass finish field applied application to glass material as visual opaque or decorative film.
 - 2. Film: Polyester
 - 3. Decorative Pattern: Custom-Printed per project (by other than Manufacturer)
 - 4. Adhesive: Acrylic, Pressure Sensitive, Permanent
 - 5. Liner: Silicone-coated Polyester
 - 6. Thickness (Film and Adhesive without Liner): 3 mils (76 microns)
 - 7. Fire Performance: Surface burning characteristics when tested in accordance with ASTM E84, Class A:

- a. Flame Spread: 25 maximum.
 - b. Smoke Developed: 450 maximum.
- C. Optical Performance:
- 1. Decorative Polyester Glass Finish Decorative Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
 - a. Ultraviolet Transmittance: 0.1 percent.
 - b. Visible Light Transmittance: 89 percent.
 - c. Visible Light Reflectance: 10 percent.
 - d. Solar Heat Transmittance: 81 percent.
 - e. Solar Heat Reflectance: 9 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.96.

2.8 ARCHITECTURAL FINISH FILMS

- A. Architectural Finish Films: 3M DICHROIC DF-PA Film as manufactured by 3M Company - Commercial Solutions.
- B. Material Properties
- 1. General: Glass finish field applied application to glass material as visual opaque or decorative graphic.
 - 2. Film: Multi-layer polymeric.
 - 3. Protective Layer: Hardcoated Polyester.
 - 4. Base Film- Blaze:
 - a. Transmissive Color: Cyan/Blue/Magenta.
 - b. Reflective Color: Red/Gold.
 - 5. Base Film- Chill:
 - a. Transmissive Color: Blue/Magenta/Yellow.
 - b. Reflective Color: Gold/Blue.
 - 6. Adhesive: Acrylic, Pressure Sensitive, Permanent.
 - 7. Liner: Silicone-coated Polyester.
 - 8. Thickness (Film and Adhesive without Liner):
 - a. Blaze: 5.2 mils (132 microns).
 - b. Chill: 5.0 mils (127 microns).
 - 9. Fire Performance: Surface burning characteristics when tested in accordance with ASTM E84: Class A:
 - a. Flame Spread: 25 maximum.
 - b. Smoke Developed: 450 maximum.
- C. Optical Performance:
- 1. Blaze Decorative Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
 - a. Ultraviolet Transmittance: 2.6 percent.
 - b. Visible Light Transmittance: 77 percent.
 - c. Visible Light Reflectance - Interior: 22 percent.
 - d. Solar Heat Transmittance: 57 percent.
 - e. Solar Heat Reflectance: 25 percent.
 - f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.70.
 - g. Spectral Data (Left Band Edges): 590nm.
 - h. Spectral Data (Right Band Edges): 795nm.
 - 2. Chill Decorative Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
 - a. Ultraviolet Transmittance: 2.4 percent.
 - b. Visible Light Transmittance: 17 percent.
 - c. Visible Light Reflectance - Interior: 78 percent.
 - d. Solar Heat Transmittance: 62 percent.
 - e. Solar Heat Reflectance: 21 percent.

- f. Shading Coefficient at 90 Degrees (Normal Incidence): 0.77.
- g. Spectral Data (Left Band Edges): 500nm.
- h. Spectral Data (Right Band Edges): 615nm.

PART 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.

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