SECTION 08 87 33

ARCHITECTURAL WINDOW FILM

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\*\* NOTE TO SPECIFIER \*\* 3M Commercial Solutions; sun control window films, safety and security window films, architectural window films.  
This section is based on the products of 3M Commercial Solutions, which is located at:  
3M Center, Bldg. 223  
St. Paul, MN 55144-1000  
Toll Free Tel: 888-650-3497  
Tel: 651-737-1081  
Fax: 651-737-8241  
Email: [request info (apeters2@mmm.com)](https://arcat.com/rfi?action=email&company=3M%252BCommercial%252BSolutions&message=RE%253A%2520Spec%2520Question%2520(08872mmm)%253A%2520&coid=47922&spec=08872mmm&rep=&fax=651-737-8241)  
Web: [http://www.3m.com/3M/en\_US/architectural-design-us/?utm\_medium=redirect&amp;utm\_source=vanity-url&amp;utm\_campaign=www.3M.com/AMD](http://www.3m.com/3M/en_US/architectural-design-us/?utm_medium=redirect&utm_source=vanity-url&utm_campaign=www.3M.com/AMD) | <http://www.3m.com/3M/en_US/building-window-solutions-us>   
  
 [ [Click Here](https://arcat.com/company/3m-commercial-solutions-47922) ] for additional information.  
  
As a leader in both adhesive and film technologies, 3M brings together these disciplines to create the finest products available for both commercial and residential use. Our line of films provides an elegant means for solving many of the most challenging aspects of managing the energy use of your business or home.  
Our films reduce up to 99 percent of the sun's ultraviolet rays and reject up to 79 percent of the solar heat that may otherwise come through a window, and can redirect daylight to increase occupant comfort, and overall energy efficiency. It also helps reduce winter heat loss by reflecting up to 17 percent of indoor heat back into the room.   
They are also easy on the eyes. On the outside, they give your home or business a more pleasing, unified look. On the inside, our films reduce the level of glare for you and others.   
3M Sun Control and 3M Ultra Safety & Security Window Films not only save energy, they help protect your furnishings, drapes, carpet, woodwork and artwork from destructive ultraviolet rays that cause fading; help to seal out the water, the primary cause of property damage; and have a toughness that allows these films to withstand day-to-day abuse.   
3M Fasara Interior, Decorative, Privacy Films are made of thin 2ml, durable polyester with a decorative matte surface, are perfect for privacy, decorative and Interior Design/Architectural Applications. Intended for use on interior glass and the inside surface of exterior windows, Fasara films can easily be used to create a custom solution for commercial and residential projects. Fasara Interior Films once applied function as a permanent solution; however, can easily be removed or repositioned when design changes are needed.

1. GENERAL
   1. SECTION INCLUDES

\*\* NOTE TO SPECIFIER \*\* Delete items below not required for project.

* + 1. 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. RELATED SECTIONS

\*\* NOTE TO SPECIFIER \*\* Delete any sections below not relevant to this project; add others as required.

* + 1. Section 08 54 13 - Fiberglass Windows.
    2. Section 08 60 00 - Roof Windows and Skylights.
    3. Section 08 83 13 - Mirrored Glass Glazing.
    4. Section 08 44 23 - Structural Sealant Glazed Curtain Wall.
  1. REFERENCES

\*\* NOTE TO SPECIFIER \*\* Delete references from the list below that are not actually required by the text of the edited section.

* + 1. ASHRAE - American Society for Heating, Refrigeration, and Air Conditioning Engineers; Handbook of Fundamentals.
    2. 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.

\*\* NOTE TO SPECIFIER \*\* Delete performance requirements not applicable to products selected

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

\*\* NOTE TO SPECIFIER \*\* Flammability properties are important to ensure the film is properly rated for interior use. Class A rated for Interior Use requires a Flame Spread Index no greater than 25; and Smoke Developed Index no greater than 450. Verify Flammability properties through submittal of 3rd Party Test reports.

* + - 1. Flame Spread Index: no greater than 25.
      2. Smoke Developed Index: no greater than 450.
  1. SUBMITTALS
     1. Submit under provisions of Section 01 30 00 - Administrative Requirements.
     2. 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.
     3. Verification Samples: For each film specified, two samples representing actual film color and pattern.
  2. QUALITY ASSURANCE
     1. Manufacturer Qualifications: All primary products specified in this section will be supplied by a single manufacturer with a minimum of ten years experience.
     2. 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:
           1. Name of building.
           2. The name and telephone number of a management contact.
           3. Type of glass.
           4. Type of film and/or film attachment system.
           5. Amount of film and/or film attachment system installed.
           6. Date of completion.

\*\* NOTE TO SPECIFIER \*\* Include a mock-up if the project size and/or quality warrant taking such a precaution. The following is one example of how a mock-up on a large project might be specified. When deciding on the extent of the mock-up, consider all the major different types of work on the project.

* + 1. 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. DELIVERY, STORAGE, AND HANDLING
     1. Follow Manufacturer's instructions for storage and handling.
     2. Store products in manufacturer's unopened packaging until ready for installation.
     3. Store and dispose of hazardous materials, and materials contaminated by hazardous materials, in accordance with requirements of local authorities having jurisdiction.
  2. PROJECT CONDITIONS
     1. 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.
  3. WARRANTY
     1. 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.
     2. 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.

1. PRODUCTS
   1. MANUFACTURERS
      1. Acceptable Manufacturer: 3M Commercial Solutions, which is located at:  
         3M Center, Bldg. 223  
         St. Paul, MN 55144-1000  
         Toll Free Tel: 888-650-3497  
         Tel: 651-737-1081  
         Fax: 651-737-8241  
         Email: [request info (apeters2@mmm.com)](https://arcat.com/rfi?action=email&company=3M%252BCommercial%252BSolutions&message=RE%253A%2520Spec%2520Question%2520(08872mmm)%253A%2520&coid=47922&spec=08872mmm&rep=&fax=651-737-8241);Web: [http://www.3m.com/3M/en\_US/architectural-design-us/?utm\_medium=redirect&amp;utm\_source=vanity-url&amp;utm\_campaign=www.3M.com/AMD](http://www.3m.com/3M/en_US/architectural-design-us/?utm_medium=redirect&utm_source=vanity-url&utm_campaign=www.3M.com/AMD) | <http://www.3m.com/3M/en_US/building-window-solutions-us>
      2. Substitutions: Not permitted.

\*\* NOTE TO SPECIFIER \*\* Delete the next article if Combination Patterned Film is not required. Retain only films required from the included options.

* 1. COMBINATION PATTERNED FILM
     1. 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.
     2. 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.

\*\* NOTE TO SPECIFIER \*\* Delete the next article if Line Patterned Film is not required. Retain only films required from the included options.

* 1. LINE PATTERNED FILM
     1. 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.
     2. 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.
     3. 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.

\*\* NOTE TO SPECIFIER \*\* Delete the next article if Single Patterned Film is not required. Retain only films required from the included options.

* 1. SINGLE PATTERNED FILM
     1. 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.
     2. 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.
     3. 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.

\*\* NOTE TO SPECIFIER \*\* 3M FASARA Glass Finishes. Delete if not required.

* 1. ARCHITECTURAL FINISH FILMS
     1. Architectural Finish Films: 3M FASARA Glass Finishes Film as manufactured by 3M Company - Commercial Solutions.
     2. 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:
           1. Flame Spread: 25 maximum.
           2. Smoke Developed: 450 maximum.

\*\* NOTE TO SPECIFIER \*\* Delete any series and patterns not required.

* + 1. Optical Performance: Gradation Series.
       1. FASARA - Illumina Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
          1. Ultraviolet Transmittance: 0.1 percent.
          2. Visible Light Transmittance: 51 percent.
          3. Visible Light Reflectance - Interior - Interior: 20 percent.
          4. Solar Heat Transmittance: 53 percent.
          5. Solar Heat Reflectance: 20 percent.
          6. 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):
          1. Ultraviolet Transmittance: 0.1 percent.
          2. Visible Light Transmittance: 66 percent.
          3. Visible Light Reflectance - Interior: 14 percent.
          4. Solar Heat Transmittance: 1 percent.
          5. Solar Heat Reflectance: 13 percent.
          6. 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):
          1. Ultraviolet Transmittance: 0.1 percent.
          2. Visible Light Transmittance: 66 percent.
          3. Visible Light Reflectance - Interior: 14 percent.
          4. Solar Heat Transmittance: 53 percent.
          5. Solar Heat Reflectance: 13 percent.
          6. 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):
          1. Ultraviolet Transmittance: 0.1 percent.
          2. Visible Light Transmittance: 36 percent.
          3. Visible Light Reflectance - Interior: 59 percent.
          4. Solar Heat Transmittance: 33 percent.
          5. Solar Heat Reflectance: 50 percent.
          6. 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):
          1. Ultraviolet Transmittance: 0.1 percent.
          2. Visible Light Transmittance: 20 percent.
          3. Visible Light Reflectance - Interior: 6 percent.
          4. Solar Heat Transmittance: 19 percent.
          5. Solar Heat Reflectance: 6 percent.
          6. 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):
          1. Ultraviolet Transmittance: 0.1 percent.
          2. Visible Light Transmittance: 79 percent.
          3. Visible Light Reflectance - Interior: 13 percent.
          4. Solar Heat Transmittance: 76 percent.
          5. Solar Heat Reflectance: 12 percent.
          6. 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):
          1. Ultraviolet Transmittance: 0.1 percent.
          2. Visible Light Transmittance: 54 percent.
          3. Visible Light Reflectance - Interior: 23 percent.
          4. Solar Heat Transmittance: 55 percent.
          5. Solar Heat Reflectance: 18 percent.
          6. 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):
          1. Ultraviolet Transmittance: 0.1 percent.
          2. Visible Light Transmittance: 35 percent.
          3. Visible Light Reflectance - Interior: 31 percent.
          4. Solar Heat Transmittance: 39 percent.
          5. Solar Heat Reflectance: 23 percent.
          6. 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):
          1. Ultraviolet Transmittance: 0.1 percent.
          2. Visible Light Transmittance: 61 percent.
          3. Visible Light Reflectance - Interior: 22 percent.
          4. Solar Heat Transmittance: 57 percent.
          5. Solar Heat Reflectance: 20 percent.
          6. 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):
           1. Ultraviolet Transmittance: 0.1 percent.
           2. Visible Light Transmittance: 83 percent.
           3. Visible Light Reflectance - Interior: 10 percent.
           4. Solar Heat Transmittance: 77 percent.
           5. Solar Heat Reflectance: 9 percent.
           6. 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):
           1. Ultraviolet Transmittance: 0.1 percent.
           2. Visible Light Transmittance: 61 percent.
           3. Visible Light Reflectance - Interior: 21 percent.
           4. Solar Heat Transmittance: 58 percent.
           5. Solar Heat Reflectance: 19 percent.
           6. Shading Coefficient at 90 Degrees (Normal Incidence): 0.75.
    2. Optical Performance: Stripe Series.
       1. FASARA - Nokto Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
          1. Ultraviolet Transmittance: 0.1 percent.
          2. Visible Light Transmittance: 13 percent.
          3. Visible Light Reflectance - Interior: 7 percent.
          4. Solar Heat Transmittance: 12 percent.
          5. Solar Heat Reflectance: 7 percent.
          6. 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):
          1. Ultraviolet Transmittance: 0.1 percent.
          2. Visible Light Transmittance: 6 percent.
          3. Visible Light Reflectance - Interior: 7 percent.
          4. Solar Heat Transmittance: 7 percent.
          5. Solar Heat Reflectance: 7 percent.
          6. 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):
          1. Ultraviolet Transmittance: 0.1 percent.
          2. Visible Light Transmittance: 59 percent.
          3. Visible Light Reflectance - Interior: 22 percent.
          4. Solar Heat Transmittance: 60 percent.
          5. Solar Heat Reflectance: 17 percent.
          6. 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):
          1. Ultraviolet Transmittance: 0.1 percent.
          2. Visible Light Transmittance: 51 percent.
          3. Visible Light Reflectance - Interior: 29 percent.
          4. Solar Heat Transmittance: 53 percent.
          5. Solar Heat Reflectance: 21 percent.
          6. 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):
          1. Ultraviolet Transmittance: 0.1 percent.
          2. Visible Light Transmittance: 67 percent.
          3. Visible Light Reflectance - Interior: 22 percent.
          4. Solar Heat Transmittance: 61 percent.
          5. Solar Heat Reflectance: 17 percent.
          6. 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):
          1. Ultraviolet Transmittance: 0.1 percent.
          2. Visible Light Transmittance: 22 percent.
          3. Visible Light Reflectance - Interior: 8 percent.
          4. Solar Heat Transmittance: 25 percent.
          5. Solar Heat Reflectance: 8 percent.
          6. 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):
          1. Ultraviolet Transmittance: 0.1 percent.
          2. Visible Light Transmittance: 74 percent.
          3. Visible Light Reflectance - Interior: 22 percent.
          4. Solar Heat Transmittance: 70 percent.
          5. Solar Heat Reflectance: 16 percent.
          6. 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):
          1. Ultraviolet Transmittance: 0.1 percent.
          2. Visible Light Transmittance: 68 percent.
          3. Visible Light Reflectance - Interior: 25 percent.
          4. Solar Heat Transmittance: 71 percent.
          5. Solar Heat Reflectance: 16 percent.
          6. 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):
          1. Ultraviolet Transmittance: 0.1 percent.
          2. Visible Light Transmittance: 48 percent.
          3. Visible Light Reflectance - Interior: 27 percent.
          4. Solar Heat Transmittance: 46 percent.
          5. Solar Heat Reflectance: 22 percent.
          6. Shading Coefficient at 90 Degrees (Normal Incidence): 0.65.
    3. Optical Performance: Border/Horizontal Series.
       1. FASARA - Lattice Decorative / Privacy Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
          1. Ultraviolet Transmittance: 0.1 percent.
          2. Visible Light Transmittance: 36 percent.
          3. Visible Light Reflectance - Interior: 28 percent.
          4. Solar Heat Transmittance: 41 percent.
          5. Solar Heat Reflectance: 22 percent.
          6. 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):
          1. Ultraviolet Transmittance: 0.1 percent.
          2. Visible Light Transmittance: 60 percent.
          3. Visible Light Reflectance - Interior: 14 percent.
          4. Solar Heat Transmittance: 62 percent.
          5. Solar Heat Reflectance: 13 percent.
          6. 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):
          1. Ultraviolet Transmittance: 0.1 percent.
          2. Visible Light Transmittance: 36 percent.
          3. Visible Light Reflectance - Interior: 28 percent.
          4. Solar Heat Transmittance: 41 percent.
          5. Solar Heat Reflectance: 22 percent.
          6. 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):
          1. Ultraviolet Transmittance: 0.1 percent.
          2. Visible Light Transmittance: 56 percent.
          3. Visible Light Reflectance - Interior: 16 percent.
          4. Solar Heat Transmittance: 58 percent.
          5. Solar Heat Reflectance: 14 percent.
          6. 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):
          1. Ultraviolet Transmittance: 0.1 percent.
          2. Visible Light Transmittance: 60 percent.
          3. Visible Light Reflectance - Interior: 18 percent.
          4. Solar Heat Transmittance: 62 percent.
          5. Solar Heat Reflectance: 16 percent.
          6. 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):
          1. Ultraviolet Transmittance: 0.1 percent.
          2. Visible Light Transmittance: 50 percent.
          3. Visible Light Reflectance - Interior: 20 percent.
          4. Solar Heat Transmittance: 53 percent.
          5. Solar Heat Reflectance: 17 percent.
          6. 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):
          1. Ultraviolet Transmittance: 0.1 percent.
          2. Visible Light Transmittance: 88 percent.
          3. Visible Light Reflectance - Interior: 9 percent.
          4. Solar Heat Transmittance: 81 percent.
          5. Solar Heat Reflectance: 9 percent.
          6. Shading Coefficient at 90 Degrees (Normal Incidence): 0.96.
    4. 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):
          1. Ultraviolet Transmittance: 0.1 percent.
          2. Visible Light Transmittance: 42 percent.
          3. Visible Light Reflectance - Interior: 7 percent.
          4. Solar Heat Transmittance: 42 percent.
          5. Solar Heat Reflectance: 7 percent.
          6. 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):
          1. Ultraviolet Transmittance: 0.1 percent.
          2. Visible Light Transmittance: 53 percent.
          3. Visible Light Reflectance - Interior: 31 percent.
          4. Solar Heat Transmittance: 49 percent.
          5. Solar Heat Reflectance: 28 percent.
          6. 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):
          1. Ultraviolet Transmittance: 0.1 percent.
          2. Visible Light Transmittance: 30 percent.
          3. Visible Light Reflectance - Interior: 51 percent.
          4. Solar Heat Transmittance: 28 percent.
          5. Solar Heat Reflectance: 44 percent.
          6. 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):
          1. Ultraviolet Transmittance: 0.1 percent.
          2. Visible Light Transmittance: 56 percent.
          3. Visible Light Reflectance - Interior: 26 percent.
          4. Solar Heat Transmittance: 58 percent.
          5. Solar Heat Reflectance: 19 percent.
          6. 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):
          1. Ultraviolet Transmittance: 0.1 percent.
          2. Visible Light Transmittance: 46 percent.
          3. Visible Light Reflectance - Interior: 22 percent.
          4. Solar Heat Transmittance: 48 percent.
          5. Solar Heat Reflectance: 17 percent.
          6. 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):
          1. Ultraviolet Transmittance: 0.1 percent.
          2. Visible Light Transmittance: 39 percent.
          3. Visible Light Reflectance - Interior: 24 percent.
          4. Solar Heat Transmittance: 43 percent.
          5. Solar Heat Reflectance: 19 percent.
          6. 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):
          1. Ultraviolet Transmittance: 0.1 percent.
          2. Visible Light Transmittance: 87 percent.
          3. Visible Light Reflectance - Interior: 8 percent.
          4. Solar Heat Transmittance: 89 percent.
          5. Solar Heat Reflectance: 8 percent.
          6. 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):
          1. Ultraviolet Transmittance: 0.1 percent.
          2. Visible Light Transmittance: 72 percent.
          3. Visible Light Reflectance - Interior: 17 percent.
          4. Solar Heat Transmittance: 67 percent.
          5. Solar Heat Reflectance: 15 percent.
          6. 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):
          1. Ultraviolet Transmittance: 0.1 percent.
          2. Visible Light Transmittance: 71 percent.
          3. Visible Light Reflectance - Interior: 16 percent.
          4. Solar Heat Transmittance: 68 percent.
          5. Solar Heat Reflectance: 13 percent.
          6. 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):
           1. Ultraviolet Transmittance: 0.1 percent.
           2. Visible Light Transmittance: 78 percent.
           3. Visible Light Reflectance - Interior: 14 percent.
           4. Solar Heat Transmittance: 73 percent.
           5. Solar Heat Reflectance: 13 percent.
           6. Shading Coefficient at 90 Degrees (Normal Incidence): 0.88.
    5. 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):
          1. Ultraviolet Transmittance: 0.1 percent.
          2. Visible Light Transmittance: 65 percent.
          3. Visible Light Reflectance - Interior: 23 percent.
          4. Solar Heat Transmittance: 73 percent.
          5. Solar Heat Reflectance: 17 percent.
          6. 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):
          1. Ultraviolet Transmittance: 0.1 percent.
          2. Visible Light Transmittance: 60 percent.
          3. Visible Light Reflectance - Interior: 23 percent.
          4. Solar Heat Transmittance: 60 percent.
          5. Solar Heat Reflectance: 17 percent.
          6. 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):
          1. Ultraviolet Transmittance: 0.1 percent.
          2. Visible Light Transmittance: 60 percent.
          3. Visible Light Reflectance - Interior: 21 percent.
          4. Solar Heat Transmittance: 60 percent.
          5. Solar Heat Reflectance: 16 percent.
          6. 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):
          1. Ultraviolet Transmittance: 0.1 percent.
          2. Visible Light Transmittance: 68 percent.
          3. Visible Light Reflectance - Interior: 18 percent.
          4. Solar Heat Transmittance: 66 percent.
          5. Solar Heat Reflectance: 14 percent.
          6. 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):
          1. Ultraviolet Transmittance: 0.1 percent.
          2. Visible Light Transmittance: 54 percent.
          3. Visible Light Reflectance - Interior: 27 percent.
          4. Solar Heat Transmittance: 54 percent.
          5. Solar Heat Reflectance: 20 percent.
          6. 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):
          1. Ultraviolet Transmittance: 0.1 percent.
          2. Visible Light Transmittance: 79 percent.
          3. Visible Light Reflectance - Interior: 15 percent.
          4. Solar Heat Transmittance: 74 percent.
          5. Solar Heat Reflectance: 12 percent.
          6. 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):
          1. Ultraviolet Transmittance: 0.1 percent.
          2. Visible Light Transmittance: 51 percent.
          3. Visible Light Reflectance - Interior: 28 percent.
          4. Solar Heat Transmittance: 54 percent.
          5. Solar Heat Reflectance: 21 percent.
          6. 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):
          1. Ultraviolet Transmittance: 0.1 percent.
          2. Visible Light Transmittance: 72 percent.
          3. Visible Light Reflectance - Interior: 8 percent.
          4. Solar Heat Transmittance: 67 percent.
          5. Solar Heat Reflectance: 7 percent.
          6. Shading Coefficient at 90 Degrees (Normal Incidence): 0.86.
    6. 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):
          1. Ultraviolet Transmittance: 0.1 percent.
          2. Visible Light Transmittance: 55 percent.
          3. Visible Light Reflectance - Interior: 26 percent.
          4. Solar Heat Transmittance: 50 percent.
          5. Solar Heat Reflectance: 23 percent.
          6. 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):
          1. Ultraviolet Transmittance: 0.1 percent.
          2. Visible Light Transmittance: 84 percent.
          3. Visible Light Reflectance - Interior: 9 percent.
          4. Solar Heat Transmittance: 78 percent.
          5. Solar Heat Reflectance: 8 percent.
          6. 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):
          1. Ultraviolet Transmittance: 0.1 percent.
          2. Visible Light Transmittance: 83 percent.
          3. Visible Light Reflectance - Interior: 9 percent.
          4. Solar Heat Transmittance: 76 percent.
          5. Solar Heat Reflectance: 8 percent.
          6. 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):
          1. Ultraviolet Transmittance: 0.1 percent.
          2. Visible Light Transmittance: 83 percent.
          3. Visible Light Reflectance - Interior: 9 percent.
          4. Solar Heat Transmittance: 76 percent.
          5. Solar Heat Reflectance: 8 percent.
          6. 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):
          1. Ultraviolet Transmittance: 0.1 percent.
          2. Visible Light Transmittance: 47 percent.
          3. Visible Light Reflectance - Interior: 35 percent.
          4. Solar Heat Transmittance: 51 percent.
          5. Solar Heat Reflectance: 26 percent.
          6. 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):
          1. Ultraviolet Transmittance: 0.1 percent.
          2. Visible Light Transmittance: 10 percent.
          3. Visible Light Reflectance - Interior: 57 percent.
          4. Solar Heat Transmittance: 13 percent.
          5. Solar Heat Reflectance: 46 percent.
          6. 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):
          1. Ultraviolet Transmittance: 0.1 percent.
          2. Visible Light Transmittance: 84 percent.
          3. Visible Light Reflectance - Interior: 9 percent.
          4. Solar Heat Transmittance: 78 percent.
          5. Solar Heat Reflectance: 8 percent.
          6. 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):
          1. Ultraviolet Transmittance: 0.1 percent.
          2. Visible Light Transmittance: 34 percent.
          3. Visible Light Reflectance - Interior: 31 percent.
          4. Solar Heat Transmittance: 39 percent.
          5. Solar Heat Reflectance: 23 percent.
          6. 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):
          1. Ultraviolet Transmittance: 0.1 percent.
          2. Visible Light Transmittance: 85 percent.
          3. Visible Light Reflectance - Interior: 9 percent.
          4. Solar Heat Transmittance: 78 percent.
          5. Solar Heat Reflectance: 8 percent.
          6. 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):
           1. Ultraviolet Transmittance: 0.1 percent.
           2. Visible Light Transmittance: 86 percent.
           3. Visible Light Reflectance - Interior: 8 percent.
           4. Solar Heat Transmittance: 79 percent.
           5. Solar Heat Reflectance: 7 percent.
           6. 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):
           1. Ultraviolet Transmittance: 0.1 percent.
           2. Visible Light Transmittance: 59 percent.
           3. Visible Light Reflectance - Interior: 21 percent.
           4. Solar Heat Transmittance: 57 percent.
           5. Solar Heat Reflectance: 17 percent.
           6. 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):
           1. Ultraviolet Transmittance: 0.1 percent.
           2. Visible Light Transmittance: 21 percent.
           3. Visible Light Reflectance - Interior: 43 percent.
           4. Solar Heat Transmittance: 25 percent.
           5. Solar Heat Reflectance: 34 percent.
           6. 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):
           1. Ultraviolet Transmittance: 0.1 percent.
           2. Visible Light Transmittance: 56 percent.
           3. Visible Light Reflectance - Interior: 18 percent.
           4. Solar Heat Transmittance: 58 percent.
           5. Solar Heat Reflectance: 14 percent.
           6. 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):
           1. Ultraviolet Transmittance: 0.1 percent.
           2. Visible Light Transmittance: 19 percent.
           3. Visible Light Reflectance - Interior: 42 percent.
           4. Solar Heat Transmittance: 18 percent.
           5. Solar Heat Reflectance: 31 percent.
           6. 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):
           1. Ultraviolet Transmittance: 0.1 percent.
           2. Visible Light Transmittance: 78 percent.
           3. Visible Light Reflectance - Interior: 10 percent.
           4. Solar Heat Transmittance: 74 percent.
           5. Solar Heat Reflectance: 9 percent.
           6. 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):
           1. Ultraviolet Transmittance: 0.1 percent.
           2. Visible Light Transmittance: 0.4 percent.
           3. Visible Light Reflectance - Interior: 5 percent.
           4. Solar Heat Transmittance: 1 percent.
           5. Solar Heat Reflectance: 5 percent.
           6. 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):
           1. Ultraviolet Transmittance: 71 percent.
           2. Visible Light Transmittance: 0 percent.
           3. Visible Light Reflectance - Interior: 91 percent.
           4. Solar Heat Transmittance: 0 percent.
           5. Solar Heat Reflectance: 78 percent.
           6. Shading Coefficient at 90 Degrees (Normal Incidence): 0.08.

\*\* NOTE TO SPECIFIER \*\* 3M CRYSTAL Glass Finishes. Delete if not required.

* 1. ARCHITECTURAL FINISH FILMS
     1. Architectural Finish Films: 3M CRYSTAL Glass Finishes as manufactured by 3M Company - Commercial Solutions.
     2. 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):
           1. Dusted - 3.2 mils (81 microns).
           2. Frosted - 4.7 mils (120 microns).
        7. Fire Performance: Surface burning characteristics when tested in accordance with ASTM E84, Class A:
           1. Flame Spread: 25 maximum.
           2. Smoke Developed: 450 maximum.
     3. Optical Performance:
        1. CRYSTAL Dusted Decorative / Privacy Glazing Film:
           1. Ultraviolet Transmittance (ASTM E 903): 27 percent.
           2. Visible Light Transmittance (ASTM E 903, ASTM E308): 85 percent.
           3. Visible Light Reflectance (ASTM E 903): 79 percent.
           4. Solar Heat Transmittance: 76 percent.
           5. Solar Heat Reflectance: 7 percent.
           6. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): 0.93.
        2. CRYSTAL Frosted Decorative / Privacy Glazing Film:
           1. Ultraviolet Transmittance (ASTM E 903): 20 percent.
           2. Visible Light Transmittance (ASTM E 903, ASTM E308): 72 percent.
           3. Visible Light Reflectance (ASTM E 903): 12 percent.
           4. Solar Heat Transmittance: 64 percent.
           5. Solar Heat Reflectance: 10 percent.
           6. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): 0.82.

\*\* NOTE TO SPECIFIER \*\* 3M Decorative Polyester Glass Finish Film Glass Finishes. Delete if not required.

* 1. ARCHITECTURAL FINISH FILMS
     1. Architectural Finish Films: 3M Decorative Polyester Glass Finish Film as manufactured by 3M Company - Commercial Solutions.
     2. 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:
           1. Flame Spread: 25 maximum.
           2. Smoke Developed: 450 maximum.
     3. Optical Performance:
        1. Decorative Polyester Glass Finish Decorative Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
           1. Ultraviolet Transmittance: 0.1 percent.
           2. Visible Light Transmittance: 89 percent.
           3. Visible Light Reflectance: 10 percent.
           4. Solar Heat Transmittance: 81 percent.
           5. Solar Heat Reflectance: 9 percent.
           6. Shading Coefficient at 90 Degrees (Normal Incidence): 0.96.

\*\* NOTE TO SPECIFIER \*\* 3M DICHROIC DF-PA Film. Delete if not required.

* 1. ARCHITECTURAL FINISH FILMS
     1. Architectural Finish Films: 3M DICHROIC DF-PA Film as manufactured by 3M Company - Commercial Solutions.
     2. 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.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - 1. Base Film- Blaze:
         1. Transmissive Color: Cyan/Blue/Magenta.
         2. Reflective Color: Red/Gold.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - 1. Base Film- Chill:
         1. Transmissive Color: Blue/Magenta/Yellow.
         2. Reflective Color: Gold/Blue.
      2. Adhesive: Acrylic, Pressure Sensitive, Permanent.
      3. Liner: Silicone-coated Polyester.
      4. Thickness (Film and Adhesive without Liner):

\*\* NOTE TO SPECIFIER \*\* Delete film not required.

* + - * 1. Blaze: 5.2 mils (132 microns).
        2. Chill: 5.0 mils (127 microns).
      1. Fire Performance: Surface burning characteristics when tested in accordance with ASTM E84: Class A:
         1. Flame Spread: 25 maximum.
         2. Smoke Developed: 450 maximum.
    1. Optical Performance:

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - 1. Blaze Decorative Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
         1. Ultraviolet Transmittance: 2.6 percent.
         2. Visible Light Transmittance: 77 percent.
         3. Visible Light Reflectance - Interior: 22 percent.
         4. Solar Heat Transmittance: 57 percent.
         5. Solar Heat Reflectance: 25 percent.
         6. Shading Coefficient at 90 Degrees (Normal Incidence): 0.70.
         7. Spectral Data (Left Band Edges): 590nm.
         8. Spectral Data (Right Band Edges): 795nm.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - 1. Chill Decorative Glazing Film applied to 3mm thick clear glass (ASTM E 903, ASTM E 308):
         1. Ultraviolet Transmittance: 2.4 percent.
         2. Visible Light Transmittance: 17 percent.
         3. Visible Light Reflectance - Interior: 78 percent.
         4. Solar Heat Transmittance: 62 percent.
         5. Solar Heat Reflectance: 21 percent.
         6. Shading Coefficient at 90 Degrees (Normal Incidence): 0.77.
         7. Spectral Data (Left Band Edges): 500nm.
         8. Spectral Data (Right Band Edges): 615nm.

1. EXECUTION
   1. EXAMINATION
      1. 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.
            1. 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.
   2. PREPARATION
      1. Clean surfaces thoroughly prior to installation.
      2. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
   3. INSTALLATION
      1. 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.
   4. CLEANING AND PROTECTION
      1. Remove left over material and debris from Work area. Use necessary means to protect film before, during, and after installation.
      2. Touch-up, repair or replace damaged products before Substantial Completion.
      3. 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