



SECTION 08872

ARCHITECTURAL WINDOW FILM

GENERAL

1.1 SECTION INCLUDES

- A. Interior Window Film.
- B. Decorative Window Film.
- C. Privacy Window Film.

1.2 RELATED SECTIONS

- A. Section 08500 - Windows: Windows to receive architectural window film.
- B. Section 08600 - Skylights: Glass Skylights to receive architectural window film.
- C. Section 08800 - Glazing: General Glazing applications to receive architectural window film.
- D. Section 08900 - Glazed Curtain Walls: Curtain Walls to receive architectural window film.

1.3 REFERENCES

- A. ASHRAE - American Society for Heating, Refrigeration, and Air Conditioning Engineers; Handbook of Fundamentals, 1997 Edition.
- B. ASTM E 84 - Standard Method of Test for Surface Burning Characteristics of Building Materials.
- C. ASTM E 308 - Standard Recommended Practice for Spectrophotometry and Description of Color in CIE 1931 System.
- D. ASTM E 903 - Standard Methods of Test for Solar Absorbance, Reflectance and Transmittance of Materials Using Integrating Spheres.
- E. ASTM G 26 - Standard Practice for Performing Accelerated Outdoor Weatherizing for Non-metallic Materials Using Concentrated Natural Sunlight.

1.4 PERFORMANCE REQUIREMENTS

- A. Fire Performance: Surface burning characteristics when tested in accordance ASTM E 84:
 - 1. Flame Spread: 25, maximum.
 - 2. Smoke Developed: 450, maximum.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01300.

- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
- C. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- D. Verification Samples: For each finish product specified, two samples representing actual product, color, and patterns.

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 (10) years experience.
- B. Installer Qualifications: All products listed in this section are to be installed by a single installer with a minimum of five (5) 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. Provide Authorized Dealer # on all documents.
 - 2. Provide a commercial building reference list of 5 properties where the installer has applied 3M Fasara 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.
 - e. Amount of film installed.
 - f. Photographs of design work.
 - g. Date of completion.
 - 3. Provide a Glass Stress Analysis of the existing glass and proposed glass/film combination as recommended by the film manufacturer.
- C. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques, design draft (for logo and design work) 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. Store products in manufacturer's unopened packaging until ready for installation.
- B. 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 absolute limits.

1.9 WARRANTY

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

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: 3M Window Film , which is located at: 3M Center Bldg. 0223-02-S-24 ; St. Paul, MN 55144-1000; Web: www.3m.com/windowfilm - **Contact the Authorized 3M Window Film Dealer:**
- B. 3M Authorized Dealer of 3M Window Film Products: APG Energy & Security Solutions located at: 12 Desbrosses Street New York, NY 10013; NY Tel: 212-929-8081 or 28 Bowling Green Parkway Lake Hopatcong, NJ, 07849; NJ Tel: 973-663-1100; Fax: 973-663-5817 Email: fasara@apgwindowfilm.com; Web: www.apgwindowfilm.com
- C. Substitutions: Not permitted.
- D. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 GRADATION PATTERNED FILM

- A. Fasara – Aerina SH2FG AR Decorative / Privacy Glazing Film:
 - 1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
 - 2. Visible Light Transmission (ASTM E 903, ASTM E308): Not more than 75 percent.
 - 3. Visible Light Rejected (ASTM E 903): Not less than 12 percent.
 - 4. Solar Heat Reduction: Not less than 10 percent.
 - 5. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): Not less than 0.86.
 - 6. 3M Window Film Point of Contact – Sena Tinaz with APG Energy & Security Solutions 3M Authorized Window Film Dealer 212-929-8081. Email: sena@apgwindowfilm.com.
- B. Fasara - Illumina SH2FG IM Decorative / Privacy Glazing Film:
 - 1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
 - 2. Visible Light Transmission (ASTM E 903, ASTM E308): 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 0.70.
 - 6. 3M Window Film Point of Contact – Sena Tinaz with APG Energy & Security Solutions 3M Authorized Window Film Dealer 212-929-8081. Email: sena@apgwindowfilm.com.
- C. Fasara – Illumina Glace SH2FG IM g Decorative/Privacy Glazing Film:
 - 1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
 - 2. Visible Light Transmission (ASTM E 903, ASTM E308): 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.
 - 6. 3M Window Film Point of Contact – Sena Tinaz with APG Energy & Security Solutions 3M Authorized Window Film Dealer 212-929-8081. Email: sena@apgwindowfilm.com.

- D. Fasara - Lontano SH2FG LO Decorative / Privacy Glazing Film:
1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
 2. Visible Light Transmission (ASTM E 903, ASTM E308): Not more than 58 percent.
 3. Visible Light Rejected (ASTM E 903): Not less than 21 percent.
 4. Solar Heat Reduction: Not less than 17 percent.
 5. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): Not less than 0.66.
 6. 3M Window Film Point of Contact – Sena Tinaz with APG Energy & Security Solutions
3M Authorized Window Film Dealer 212-929-8081. Email: sena@apgwindowfilm.com.
- E. Fasara - Tsurugi SH2FG TG Decorative / Privacy Glazing Film:
1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
 2. Visible Light Transmission (ASTM E 903, ASTM E308): Not more than 58 percent.
 3. Visible Light Rejected (ASTM E 903): Not less than 20 percent.
 4. Solar Heat Reduction: Not less than 16 percent.
 5. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): Not less than 0.67.
 6. 3M Window Film Point of Contact – Sena Tinaz with APG Energy & Security Solutions
3M Authorized Window Film Dealer 212-929-8081. Email: sena@apgwindowfilm.com.

2.3 PRISM AND DOT PATTERNED FILM

- A. Fasara – Astral Silver SH2CS AS Decorative / Privacy Glazing Film:
1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
 2. Visible Light Transmission (ASTM E 903, ASTM E308): Not more than 11 percent.
 3. Visible Light Rejected (ASTM E 903): Not less than 63 percent.
 4. Solar Heat Reduction: Not less than 51 percent.
 5. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): Not less than 0.19.
 6. 3M Window Film Point of Contact – Sena Tinaz with APG Energy & Security Solutions
3M Authorized Window Film Dealer 212-929-8081. Email: sena@apgwindowfilm.com.
- B. Fasara - Aura 9 SH2PC A9 Decorative / Privacy Glazing Film:
1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
 2. Visible Light Transmission (ASTM E 903, ASTM E308): Not more than 83 percent.
 3. Visible Light Rejected (ASTM E 903): Not less than 8 percent.
 4. Solar Heat Reduction: Not less than 7 percent.
 5. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): Not less than 0.94.
 6. 3M Window Film Point of Contact – Sena Tinaz with APG Energy & Security Solutions
3M Authorized Window Film Dealer 212-929-8081. Email: sena@apgwindowfilm.com.
- C. Fasara – Cielo SH2FG CE Decorative / Privacy Glazing Film:
1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
 2. Visible Light Transmission (ASTM E 903, ASTM E308): Not more than 45 percent.
 3. Visible Light Rejected (ASTM E 903): Not less than 19 percent.
 4. Solar Heat Reduction: Not less than 15 percent.
 5. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): Not less than 0.69.
 6. 3M Window Film Point of Contact – Sena Tinaz with APG Energy & Security Solutions
3M Authorized Window Film Dealer 212-929-8081. Email: sena@apgwindowfilm.com.
- D. Fasara - Luna 6 SH2PC L6 Decorative / Privacy Glazing Film:
1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
 2. Visible Light Transmission (ASTM E 903, ASTM E308): Not more than 44 percent.

3. Visible Light Rejected (ASTM E 903): Not less than 21 percent.
4. Solar Heat Reduction: Not less than 15 percent.
5. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): Not less than 0.67.
6. 3M Window Film Point of Contact – Sena Tinaz with APG Energy & Security Solutions
3M Authorized Window Film Dealer 212-929-8081. Email: sena@apgwindowfilm.com.

E. Fasara - Luna 9 SH2PC L9 Decorative / Privacy Glazing Film:

1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
2. Visible Light Transmission (ASTM E 903, ASTM E308): Not more than 39 percent.
3. Visible Light Rejected (ASTM E 903): Not less than 23 percent.
4. Solar Heat Reduction: Not less than 16 percent.
5. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): Not less than 0.63.
6. 3M Window Film Point of Contact – Sena Tinaz with APG Energy & Security Solutions
3M Authorized Window Film Dealer 212-929-8081. Email: sena@apgwindowfilm.com.

G. Fasara – Prism Noir SH2CS PN Decorative / Privacy Glazing Film:

2. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
3. Visible Light Transmission (ASTM E 903, ASTM E308): Not more than 29 percent.
4. Visible Light Rejected (ASTM E 903): Not less than 7 percent.
5. Solar Heat Reduction: Not less than 6 percent.
6. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): Not less than 0.48.
7. 3M Window Film Point of Contact – Sena Tinaz with APG Energy & Security Solutions
3M Authorized Window Film Dealer 212-929-8081. Email: sena@apgwindowfilm.com.

H. Fasara – Prism Silver SH2CS PS Decorative / Privacy Glazing Film:

1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
2. Visible Light Transmission (ASTM E 903, ASTM E308): Not more than 34 percent.
3. Visible Light Rejected (ASTM E 903): Not less than 49 percent.
4. Solar Heat Reduction: Not less than 40 percent.
5. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): Not less than 0.80.
6. 3M Window Film Point of Contact – Sena Tinaz with APG Energy & Security Solutions
3M Authorized Window Film Dealer 212-929-8081. Email: sena@apgwindowfilm.com.

I. Fasara - Vista SH2FG VI Decorative / Privacy Glazing Film:

1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
2. Visible Light Transmission (ASTM E 903, ASTM E308): Not more than 69 percent.
3. Visible Light Rejected (ASTM E 903): Not less than 16 percent.
4. Solar Heat Reduction: Not less than 13 percent.
5. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): Not less than 0.80.
6. 3M Window Film Point of Contact – Sena Tinaz with APG Energy & Security Solutions
3M Authorized Window Film Dealer 212-929-8081. Email: sena@apgwindowfilm.com.

2.4 LINE AND STRIPE PATTERNED FILM

A. Fasara - Arpa SH2FG AP Decorative / Privacy Glazing Film:

1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
2. Visible Light Transmission (ASTM E 903, ASTM E308): Not more than 46 percent.
3. Visible Light Rejected (ASTM E 903): Not less than 22 percent.
4. Solar Heat Reduction: Not less than 17 percent.
5. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): Not less than 0.66.

6. 3M Window Film Point of Contact – Sena Tinaz with APG Energy & Security Solutions
3M Authorized Window Film Dealer 212-929-8081. Email: sena@apgwindowfilm.com.
- B. Fasara - Arpa Black SH2BK AP Decorative / Privacy Glazing Film:
1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
 2. Visible Light Transmission (ASTM E 903, ASTM E308): Not more than 30 percent.
 3. Visible Light Rejected (ASTM E 903): Not less than 7 percent.
 4. Solar Heat Reduction: Not less than 6 percent.
 5. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): Not less than 0.59.
 6. 3M Window Film Point of Contact – Sena Tinaz with APG Energy & Security Solutions
3M Authorized Window Film Dealer 212-929-8081. Email: sena@apgwindowfilm.com.
- C. Fasara - Fine SH2FG FN Decorative / Privacy Glazing Film:
1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
 2. Visible Light Transmission (ASTM E 903, ASTM E308): 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.
 6. 3M Window Film Point of Contact – Sena Tinaz with APG Energy & Security Solutions
3M Authorized Window Film Dealer 212-929-8081. Email: sena@apgwindowfilm.com.
- D. Fasara – Lattice SH2FG LT Decorative / Privacy Glazing Film:
1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
 2. Visible Light Transmission (ASTM E 903, ASTM E308): Not more than 34 percent.
 3. Visible Light Rejected (ASTM E 903): Not less than 26 percent.
 4. Solar Heat Reduction: Not less than 19 percent.
 5. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): Not less than 0.60.
 6. 3M Window Film Point of Contact – Sena Tinaz with APG Energy & Security Solutions
3M Authorized Window Film Dealer 212-929-8081. Email: sena@apgwindowfilm.com.
- E. Fasara – Lattice g Glace SH2FG LTg Decorative / Privacy Glazing Film:
1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
 2. Visible Light Transmission (ASTM E 903, ASTM E308): 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.
 6. 3M Window Film Point of Contact – Sena Tinaz with APG Energy & Security Solutions
3M Authorized Window Film Dealer 212-929-8081. Email: sena@apgwindowfilm.com.
- F. Fasara - Leise SH2FG LS Decorative / Privacy Glazing Film:
1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
 2. Visible Light Transmission (ASTM E 903, ASTM E308): Not more than 74 percent.
 3. Visible Light Rejected (ASTM E 903): Not less than 8 percent.
 4. Solar Heat Reduction Not less than 7 percent.
 5. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): Not less than 0.94.
 6. 3M Window Film Point of Contact – Sena Tinaz with APG Energy & Security Solutions
3M Authorized Window Film Dealer 212-929-8081. Email: sena@apgwindowfilm.com.

G. Fasara – Nokto SH2CS NK Decorative / Privacy Glazing Film:

1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
2. Visible Light Transmission (ASTM E 903, ASTM E308): Not more than 12 percent.
3. Visible Light Rejected (ASTM E 903): Not less than 7 percent.
4. Solar Heat Reduction: Not less than 6 percent.
5. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): Not less than 0.30.
6. 3M Window Film Point of Contact – Sena Tinaz with APG Energy & Security Solutions
3M Authorized Window Film Dealer 212-929-8081. Email: sena@apgwindowfilm.com.

H. Fasara - Paracell SH2FG PR Decorative / Privacy Glazing Film:

1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
2. Visible Light Transmission (ASTM E 903, ASTM E308): Not more than 48 percent.
3. Visible Light Rejected (ASTM E 903): Not less than 19 percent.
4. Solar Heat Reduction: Not less than 15 percent.
5. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): Not less than 0.69.
6. 3M Window Film Point of Contact – Sena Tinaz with APG Energy & Security Solutions
3M Authorized Window Film Dealer 212-929-8081. Email: sena@apgwindowfilm.com.

I. Fasara – Pixela SH2FG PX Decorative / Privacy Glazing Film:

1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
2. Visible Light Transmission (ASTM E 903, ASTM E308): Not more than 57 percent.
3. Visible Light Rejected (ASTM E 903): Not less than 17 percent.
4. Solar Heat Reduction: Not less than 14 percent.
5. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): Not less than 0.75.
6. 3M Window Film Point of Contact – Sena Tinaz with APG Energy & Security Solutions
3M Authorized Window Film Dealer 212-929-8081. Email: sena@apgwindowfilm.com.

J. Fasara – Radius SH2CS RD Decorative / Privacy Glazing Film:

1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
2. Visible Light Transmission (ASTM E 903, ASTM E308): Not more than 6 percent.
3. Visible Light Rejected (ASTM E 903): Not less than 7 percent.
4. Solar Heat Reduction: Not less than 6 percent.
5. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): Not less than 0.25.
6. 3M Window Film Point of Contact – Sena Tinaz with APG Energy & Security Solutions
3M Authorized Window Film Dealer 212-929-8081. Email: sena@apgwindowfilm.com.

K. Fasara – Seattle SH2DG ST Decorative / Privacy Glazing Film:

1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
2. Visible Light Transmission (ASTM E 903, ASTM E308): Not more than 73 percent.
3. Visible Light Rejected (ASTM E 903): Not less than 12 percent.
4. Solar Heat Reduction: Not less than 9 percent.
5. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): Not less than 0.86.
6. 3M Window Film Point of Contact – Sena Tinaz with APG Energy & Security Solutions
3M Authorized Window Film Dealer 212-929-8081. Email: sena@apgwindowfilm.com.

L. Fasara - Shutie SH2FG ST Decorative / Privacy Glazing Film:

1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
2. Visible Light Transmission (ASTM E 903, ASTM E308): Not more than 52 percent.
3. Visible Light Rejected (ASTM E 903): Not less than 21 percent.
4. Solar Heat Reduction: Not less than 17 percent.

5. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): Not less than 0.69.
6. 3M Window Film Point of Contact – Sena Tinaz with APG Energy & Security Solutions
3M Authorized Window Film Dealer 212-929-8081. Email: sena@apgwindowfilm.com.

M. Fasara - Shutie Black SH2BK ST Decorative / Privacy Glazing Film:

1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
2. Visible Light Transmission (ASTM E 903, ASTM E308): Not more than 49 percent.
3. Visible Light Rejected (ASTM E 903): Not less than 6 percent.
4. Solar Heat Reduction: Not less than 6 percent.
5. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): Not less than 0.70.
6. 3M Window Film Point of Contact – Sena Tinaz with APG Energy & Security Solutions
3M Authorized Window Film Dealer 212-929-8081. Email: sena@apgwindowfilm.com.

N. Fasara – Slat SH2FG SL Decorative / Privacy Glazing Film:

1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
2. Visible Light Transmission (ASTM E 903, ASTM E308): Not more than 34 percent.
3. Visible Light Rejected (ASTM E 903): Not less than 26 percent.
4. Solar Heat Reduction: Not less than 19 percent.
5. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): Not less than 0.60.
6. 3M Window Film Point of Contact – Sena Tinaz with APG Energy & Security Solutions
3M Authorized Window Film Dealer 212-929-8081. Email: sena@apgwindowfilm.com.

O. Fasara – Slat g Glace SH2FG SLg Decorative / Privacy Glazing Film:

1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
2. Visible Light Transmission (ASTM E 903, ASTM E308): 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.
6. 3M Window Film Point of Contact – Sena Tinaz with APG Energy & Security Solutions
3M Authorized Window Film Dealer 212-929-8081. Email: sena@apgwindowfilm.com.

2.5 FABRIC AND JAPANESE PAPER PATTERNED FILM

A. Fasara - Altair SH2FG AT Decorative / Privacy Glazing Film:

1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
2. Visible Light Transmission (ASTM E 903, ASTM E308): Not more than 52 percent.
3. Visible Light Rejected (ASTM E 903): Not less than 16 percent.
4. Solar Heat Reduction: Not less than 12 percent.
5. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): Not less than 0.73.
6. 3M Window Film Point of Contact – Sena Tinaz with APG Energy & Security Solutions
3M Authorized Window Film Dealer 212-929-8081. Email: sena@apgwindowfilm.com.

B. Fasara – Linen SH2FG LN Decorative / Privacy Glazing Film:

1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
2. Visible Light Transmission (ASTM E 903, ASTM E308): Not more than 62 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 0.74.
6. 3M Window Film Point of Contact – Sena Tinaz with APG Energy & Security Solutions
3M Authorized Window Film Dealer 212-929-8081. Email: sena@apgwindowfilm.com.

C. Fasara - Rikyu SH2PT RK Decorative / Privacy Glazing Film:

1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
2. Visible Light Transmission (ASTM E 903, ASTM E308): Not more than 47 percent.
3. Visible Light Rejected (ASTM E 903): Not less than 18 percent.
4. Solar Heat Reduction: Not less than 13 percent.
5. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): Not less than 0.69.
6. 3M Window Film Point of Contact – Sena Tinaz with APG Energy & Security Solutions
3M Authorized Window Film Dealer 212-929-8081. Email: sena@apgwindowfilm.com.

D. Fasara - Sagano SH2PT SA Decorative / Privacy Glazing Film:

1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
2. Visible Light Transmission (ASTM E 903, ASTM E308): Not more than 53 percent.
3. Visible Light Rejected (ASTM E 903): Not less than 16 percent.
4. Solar Heat Reduction: Not less than 12 percent.
5. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): Not less than 0.75.
6. 3M Window Film Point of Contact – Sena Tinaz with APG Energy & Security Solutions
3M Authorized Window Film Dealer 212-929-8081. Email: sena@apgwindowfilm.com.

E. Fasara - Vega SH2FG VG Decorative / Privacy Glazing Film:

1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
2. Visible Light Transmission (ASTM E 903, ASTM E308): Not more than 49 percent.
3. Visible Light Rejected (ASTM E 903): Not less than 16 percent.
4. Solar Heat Reduction: Not less than 12 percent.
5. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): Not less than 0.71.
6. 3M Window Film Point of Contact – Sena Tinaz with APG Energy & Security Solutions
3M Authorized Window Film Dealer 212-929-8081. Email: sena@apgwindowfilm.com.

F. Fasara - Yamato SH2PT YA Decorative / Privacy Glazing Film:

1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
2. Visible Light Transmission (ASTM E 903, ASTM E308): Not more than 52 percent.
3. Visible Light Rejected (ASTM E 903): Not less than 15 percent.
4. Solar Heat Reduction: Not less than 11 percent.
5. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): Not less than 0.75.
6. 3M Window Film Point of Contact – Sena Tinaz with APG Energy & Security Solutions
3M Authorized Window Film Dealer 212-929-8081. Email: sena@apgwindowfilm.com.

2.6 FROST AND MATTE PATTERNED FILM

A. Fasara - Chamonix SH2EM CH Decorative / Privacy Glazing Film:

1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
2. Visible Light Transmission (ASTM E 903, ASTM E308): Not more than 47 percent.
3. Visible Light Rejected (ASTM E 903): Not less than 29 percent.
4. Solar Heat Reduction: Not less than 20 percent.
5. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): Not less than 0.67.
6. 3M Window Film Point of Contact – Sena Tinaz with APG Energy & Security Solutions
3M Authorized Window Film Dealer 212-929-8081. Email: sena@apgwindowfilm.com.

B. Fasara – Essen SH2EM ES Decorative / Privacy Glazing Film:

1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
2. Visible Light Transmission (ASTM E 903, ASTM E308): Not more than 55 percent.

3. Visible Light Rejected (ASTM E 903): Not less than 23 percent.
 4. Solar Heat Reduction: Not less than 19 percent.
 5. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): Not less than 0.67.
 6. 3M Window Film Point of Contact – Sena Tinaz with APG Energy & Security Solutions
3M Authorized Window Film Dealer 212-929-8081. Email: sena@apgwindowfilm.com.
- C. Fasara - Fine Crystal SH2FN CR Decorative / Privacy Glazing Film:
1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
 2. Visible Light Transmission (ASTM E 903, ASTM E308): Not more than 83 percent.
 3. Visible Light Rejected (ASTM E 903): Not less than 8 percent.
 4. Solar Heat Reduction: Not less than 7 percent.
 5. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): Not less than 0.93.
 6. 3M Window Film Point of Contact – Sena Tinaz with APG Energy & Security Solutions
3M Authorized Window Film Dealer 212-929-8081. Email: sena@apgwindowfilm.com.
- D. Fasara – Glace SH2MA GL Decorative / Privacy Glazing Film:
1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
 2. Visible Light Transmission (ASTM E 903, ASTM E308): Not more than 77 percent.
 3. Visible Light Rejected (ASTM E 903): Not less than 9 percent.
 4. Solar Heat Reduction: Not less than 8 percent.
 5. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): Not less than 0.89.
 6. 3M Window Film Point of Contact – Sena Tinaz with APG Energy & Security Solutions
3M Authorized Window Film Dealer 212-929-8081. Email: sena@apgwindowfilm.com.
- E. Fasara - Lausanne SH2EM LA Decorative / Privacy Glazing Film:
1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
 2. Visible Light Transmission (ASTM E 903, ASTM E308): Not more than 82 percent.
 3. Visible Light Rejected (ASTM E 903): Not less than 9 percent.
 4. Solar Heat Reduction: Not less than 8 percent.
 5. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): Not less than 0.90.
 6. 3M Window Film Point of Contact – Sena Tinaz with APG Energy & Security Solutions
3M Authorized Window Film Dealer 212-929-8081. Email: sena@apgwindowfilm.com.
- F. Fasara - Luce SH2FG LU Decorative / Privacy Glazing Film:
1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
 2. Visible Light Transmission (ASTM E 903, ASTM E308): Not more than 31 percent.
 3. Visible Light Rejected (ASTM E 903): Not less than 25 percent.
 4. Solar Heat Reduction: Not less than 17 percent.
 5. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): Not less than 0.59.
 6. 3M Window Film Point of Contact – Sena Tinaz with APG Energy & Security Solutions
3M Authorized Window Film Dealer 212-929-8081. Email: sena@apgwindowfilm.com.
- G. Fasara - Mat Crystal SH2MAC RX Decorative / Privacy Glazing Film:
1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
 2. Visible Light Transmission (ASTM E 903, ASTM E308): Not more than 88 percent.
 3. Visible Light Rejected (ASTM E 903): Not less than 7 percent.
 4. Solar Heat Reduction: Not less than 6 percent.
 5. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): Not less than 0.92.
 6. 3M Window Film Point of Contact – Sena Tinaz with APG Energy & Security Solutions
3M Authorized Window Film Dealer 212-929-8081. Email: sena@apgwindowfilm.com.

- H. Fasara - Mat Crystal i SH2MA CRi Decorative / Privacy Glazing Film:
1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
 2. Visible Light Transmission (ASTM E 903, ASTM E308): 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
 6. 3M Window Film Point of Contact – Sena Tinaz with APG Energy & Security Solutions
3M Authorized Window Film Dealer 212-929-8081. Email: sena@apgwindowfilm.com.
- I. Fasara - Mat Crystal 2 SH2MA CRX2 EXTERNAL Decorative / Privacy Glazing Film:
1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
 2. Visible Light Transmission (ASTM E 903, ASTM E308): Not more than 85 percent.
 3. Visible Light Rejected (ASTM E 903): Not less than 7 percent.
 4. Solar Heat Reduction: Not less than 6 percent.
 5. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): Not less than 0.92
 6. 3M Window Film Point of Contact – Sena Tinaz with APG Energy & Security Solutions
3M Authorized Window Film Dealer 212-929-8081. Email: sena@apgwindowfilm.com.
- J. Fasara – Milky Milky - San Marino SH2MA MM Decorative / Privacy Glazing Film:
1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
 2. Visible Light Transmission (ASTM E 903, ASTM E308): 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.
 6. 3M Window Film Point of Contact – Sena Tinaz with APG Energy & Security Solutions
3M Authorized Window Film Dealer 212-929-8081. Email: sena@apgwindowfilm.com.
- K. Fasara – Milky White- Milano SH2MA ML Decorative / Privacy Glazing Film:
1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
 2. Visible Light Transmission (ASTM E 903, ASTM E308): Not more than 59 percent.
 3. Visible Light Rejected (ASTM E 903): Not less than 17 percent.
 4. Solar Heat Reduction: Not less than 13 percent.
 5. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): Not less than 0.75.
 6. 3M Window Film Point of Contact – Sena Tinaz with APG Energy & Security Solutions
3M Authorized Window Film Dealer 212-929-8081. Email: sena@apgwindowfilm.com.
- L. Fasara - Opaque White SH2MA OW Decorative / Privacy Glazing Film:
1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
 2. Visible Light Transmission (ASTM E 903, ASTM E308): Not more than 6 percent.
 3. Visible Light Rejected (ASTM E 903): Not less than 52 percent.
 4. Solar Heat Reduction: Not less than 41 percent.
 5. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): Not less than 0.29.
 6. 3M Window Film Point of Contact – Sena Tinaz with APG Energy & Security Solutions
3M Authorized Window Film Dealer 212-929-8081. Email: sena@apgwindowfilm.com.
- M. Fasara - Oslo SH2EM OS Decorative / Privacy Glazing Film:
1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
 2. Visible Light Transmission (ASTM E 903, ASTM E308): Not more than 55 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 0.69.
6. 3M Window Film Point of Contact – Sena Tinaz with APG Energy & Security Solutions
3M Authorized Window Film Dealer 212-929-8081. Email: sena@apgwindowfilm.com.

N. Fasara – Clear SH2CLAR Decorative / Privacy Glazing Film:

1. Ultraviolet Rejected (ASTM E 903): Not less than 99 percent.
2. Visible Light Transmission (ASTM E 903, ASTM E308): Not more than 88 percent.
3. Visible Light Rejected (ASTM E 903): Not less than 9 percent.
4. Solar Heat Reduction: Not less than 7 percent.
5. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): Not less than 0.94.
6. 3M Window Film Point of Contact – Sena Tinaz with APG Energy & Security Solutions
3M Authorized Window Film Dealer 212-929-8081. Email: sena@apgwindowfilm.com.

2.7 FASARA NANO STYLE FILM

A. Fasara – Nano Illumina NANO FGIM Decorative / Privacy Glazing Film:

1. Ultraviolet Rejected (ASTM E 903): Not less than 100 percent.
2. Visible Light Transmission (ASTM E 903, ASTM E308): Not more than 53 percent.
3. Visible Light Rejected (ASTM E 903): Not less than 26 percent.
4. Solar Heat Reduction: Not less than 29 percent.
5. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): Not less than 0.53.
6. 3M Window Film Point of Contact – Sena Tinaz with APG Energy & Security Solutions
3M Authorized Window Film Dealer 212-929-8081. Email: sena@apgwindowfilm.com.

B. Fasara – Nano Luce NANO FGLU Decorative / Privacy Glazing Film:

1. Ultraviolet Rejected (ASTM E 903): Not less than 100 percent.
2. Visible Light Transmission (ASTM E 903, ASTM E308): Not more than 37 percent.
3. Visible Light Rejected (ASTM E 903): Not less than 34 percent.
4. Solar Heat Reduction: Not less than 34 percent.
5. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): Not less than 0.37.
6. 3M Window Film Point of Contact – Sena Tinaz with APG Energy & Security Solutions
3M Authorized Window Film Dealer 212-929-8081. Email: sena@apgwindowfilm.com.

C. Fasara – Nano Milky White Milano NANO MAML Decorative / Privacy Glazing Film:

1. Ultraviolet Rejected (ASTM E 903): Not less than 100 percent.
2. Visible Light Transmission (ASTM E 903, ASTM E308): Not more than 56 percent.
3. Visible Light Rejected (ASTM E 903): Not less than 24 percent.
4. Solar Heat Reduction: Not less than 30 percent.
5. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E 903): Not less than 0.56.
6. 3M Window Film Point of Contact – Sena Tinaz with APG Energy & Security Solutions
3M Authorized Window Film Dealer 212-929-8081. Email: sena@apgwindowfilm.com.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

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. Install in accordance with manufacturer's instructions.
- B. 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.
- C. 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.
- D. Apply film to glass and lightly spray film with slip solution.
- E. Squeegee from top to bottom of window. Spray slip solution to film and squeegee a second time.
- F. Bump film edge with lint-free towel wrapped around edge of a 5-way tool.
- G. 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.

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

3M Fasara Decorative Glass Finishes for Interiors and Exteriors Performance Chart

Specimen: Film laminated to 6mm thick float glass (Face of incidence: glass surface)

		Ultraviolet Rejected	Visible Light Transmitted	Visible Light Rejected	Solar Heat Reduction	Shading Coefficient 90 Degrees
GRADATION PATTERNS	Product ID	(not less than)	(not more than)	(not less than)	(not less than)	
Aerina	SH2FG AR	99%	75%	12%	10%	0.86
Illumina	SH2FG IM	99%	49%	19%	14%	0.70
Illumina g	SH2FG IMg	99%	63%	13%	11%	0.74
Lontano	SH2FG LO	99%	58%	21%	17%	0.66
Tsurugi	SH2FG TG	99%	58%	20%	16%	0.67
		Ultraviolet Rejected	Visible Light Transmitted	Visible Light Rejected	Solar Heat Reduction	Shading Coefficient 90 Degrees
LINE/STRIPE PATTERNS	Product ID	(not less than)	(not more than)	(not less than)	(not less than)	
Arpa	SH2FG AP	99%	46%	22%	17%	0.66
Arpa Black	SH2BK AP	99%	30%	7%	6%	0.59
Fine	SH2FG FN	99%	46%	25%	19%	0.62
Lattice	SH2FG LT	99%	34%	26%	19%	0.60
Lattice g	SH2FG LTg	99%	57%	13%	11%	0.71
Leise	SH2FG LS	99%	74%	8%	7%	0.94
Nokto	SH2CS NK	99%	12%	7%	6%	0.30
Paracell	SH2FG PR	99%	48%	19%	15%	0.69
Pixela	SH2FG PX	99%	57%	17%	14%	0.75
Radius	SH2CS RD	99%	6%	7%	6%	0.25
Seattle	SH2DG ST	99%	73%	12%	9%	0.86
Shutie	SH2FG ST	99%	52%	21%	17%	0.69
Shutie Black	SH2BK ST	99%	49%	6%	6%	0.70
Slat	SH2FGSL	99%	34%	26%	19%	0.60
Slat g	SH2FG SLg	99%	53%	15%	12%	0.68
		Ultraviolet Rejected	Visible Light Transmitted	Visible Light Rejected	Solar Heat Reduction	Shading Coefficient 90 Degrees
PRISM/DOT/SILVER PATTERNS	Product ID	(not less than)	(not more than)	(not less than)	(not less than)	
Astral Silver	SH2CS AS	99%	11%	63%	51%	0.19
Aura 9	SH2PC A9	99%	83%	8%	7%	0.94
Cielo	SH2FG CE	99%	45%	19%	15%	0.69
Kanon	SH2FG KN	99%	0%	0%	0%	0.00
Luna 6	SH2PC L6	99%	44%	21%	15%	0.67
Luna 9	SH2PC L9	99%	37%	23%	16%	0.63
Prism Noir	SH2CS PN	99%	29%	7%	6%	0.48
Prism Silver	SH2CS PS	99%	34%	49%	40%	0.40
Shizuku	SH2FG SK	99%	0%	0%	0%	0.00
Vista	SH2FG VI	99%	69%	16%	13%	0.80

		Ultraviolet Rejected	Visible Light Transmitted	Visible Light Rejected	Solar Heat Reduction	Shading Coefficient 90 Degrees
FABRIC/JAPANESE PATTERNS	Product ID	(not less than)	(not more than)	(not less than)	(not less than)	
Altair	SH2FG AT	99%	52%	16%	12%	0.73
Linen	SH2FG LN	99%	62%	15%	12%	0.74
Rikyu	SH2PT RK	99%	47%	18%	13%	0.69
Sagano	SH2PT SA	99%	53%	16%	12%	0.75
Vega	SH2FG VG	99%	48%	16%	12%	0.71
Yamato	SH2PT YA	99%	52%	15%	11%	0.75
		Ultraviolet Rejected	Visible Light Transmitted	Visible Light Rejected	Solar Heat Reduction	Shading Coefficient 90 Degrees
FROST/MAT PATTERNS	Product ID	(not less than)	(not more than)	(not less than)	(not less than)	
Chamonix	SH2EM CH	99%	47%	29%	20%	0.67
Essen	SH2EM ES	99%	55%	23%	19%	0.67
Fine Crystal	SH2FN CR	99%	83%	8%	7%	0.93
Glace	SH2MA GL	99%	55%	15%	12%	0.69
Lausanne	SH2EM LA	99%	82%	9%	8%	0.90
Luce	SH2FG LU	99%	31%	27%	17%	0.59
Mat Crystal 2 (exterior film)	SH2MA CRX2	99%	85%	7%	6%	0.92
Mat Crystal i	SH2MA CRi	99%	83%	8%	8%	0.91
Milky Milky - San Marino	SH2MA MM	99%	28%	25%	20%	0.55
Milky White - Milano	SH2MA ML	99%	59%	17%	13%	0.75
Opaque White	SH2MA OW	99%	6%	52%	41%	0.29
Oslo	SH2EM OS	99%	77%	9%	8%	0.89
Clear	SH2CLAR	99%	88%	9%	7%	0.94
		Ultraviolet Rejected	Visible Light Transmitted	Visible Light Rejected	Solar Heat Reduction	Shading Coefficient 90 Degrees
NANO STYLES	Product ID	(not less than)	(not more than)	(not less than)	(not less than)	
Nano Illumina	Nano FGIM	100%	53%	26%	29%	0.53
Nano Luce	Nano FGLU	100%	37%	34%	34%	0.37
Nano Milky White - Nano Milano	Nano MAML	100%	56%	24%	30%	0.56