TRIDENT S4DN35

SECTION 08 87 23

SAFETY AND SECURITY FILMS

PART 1 – GENERAL

1.1 SUMMARY

A. Optically clear, anti-fragmentation protective polymeric film for glass hazard mitigation.

1.2 RELATED SECTIONS

A. Section 08 41 13 – Aluminum-Framed Entrances and Storefronts: Glazing system to receive safety and security control film.

B. Section 08 81 00 – Glass Glazing: Glass and glazing materials to receive safety and security control film.

1.3 REFERENCES

A. Code of Federal Regulations:

1. 16 CFR 1201 -Safety Standard for Architectural Glazing Materials.

B. American National Standards Institute (ANSI):

1. Z97.1 - Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test.

C. American Society for Testing and Materials (ASTM), latest edition:

1. D635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position

2. D882 - Standard Test Method for Tensile Properties of Thin Plastic Sheeting.

3. D1044 - Standard Test Method for Resistance of Transparent Plastics to Surface Abrasion. (Taber Abrader Test)

4. D1922 / 1004 - Standard Test Method for Propagation Tear Resistance of Plastic Film and Thin Sheeting by Pendulum Method

5. D1929 - Standard Test Method for Determining Ignition Temperature of Plastics.

6. D2582 - Standard Test Method for Puncture-Propagation Tear Resistance of Plastic Film and Thin Sheeting

7. D3330 -Standard Test Method for Peel Adhesion of Pressure-Sensitive Tape.

8. D4830 - Standard Test Methods for Characterizing Thermoplastic Fabrics Used in Roofing and Waterproofing

9. E84 - Standard Test Method for Surface Burning Characteristics of Building Materials

10. E162 - Standard Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source

11. E662 - Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials.

D. British Standards Institution (BSI):

1. BS 6206 - Specification for Impact Performance Requirements for Flat Safety Glass.

2. EN 12600 - Glass in building. Pendulum test. Impact test method and classification for flat glass.

3. EN 356 - Glass in building. Security glazing. Testing and classification of resistance against manual attack.

E. GSA: US General Services Administration Explosion Resistant Standard Class 3A

F. ISO 16933, Glass in building – Explosion resistant security glazing – Test and classification for arena air blast loading.

1.4 ACTION SUBMITTALS

A. Submit in accordance with requirements of Section 01 33 00.

B. Product Data: Submit manufacturer's product data for each type of window film specified.

C. Samples: Submit 12-inch square sample of each window film [and color] specified for verification purposes.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: Submit manufacturer's maintenance data for each safety and security control film installed for inclusion in Operation and Maintenance Manuals.

1.6 QUALITY ASSURANCE

A. Mock Ups: Build mockups to verify selections made under sample submittals and to evaluate surface preparation techniques and application workmanship.

1. Construct mockups in the location and of the size indicated or, if not indicated, as directed by Architect.

2. Approved mock ups may remain as a part of the completed Work if undisturbed at time of Substantial Completion.

B. Preinstallation Conference: Conduct conference at project site to discuss methods and procedures relating to the installation of safety and security control films.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver safety and security control films to Project Site in manufacturer's unopened packaging.

B. Store and protect safety and security control films in compliance with manufacturer's directions and as required to prevent damage to materials from condensation, temperature changes, direct exposure to sun, or other causes.

1.8 FIELD CONDITIONS

A. Environmental Conditions: Do not proceed with application of safety and security control films when ambient and substrate temperature conditions are outside the limits permitted by film manufacturer or when substrates are wet from rain, frost, condensation, or other causes.

1.9 WARRANTY

A. Manufacturer's Warranty: Manufacturer's standard limited warranty in which manufacturer agrees to repair or replace materials that do not comply with requirements or fail in materials or workmanship within the specified warranty period.

1. Warranty Period: 12 Years (Interior Film applications) Limited Warranty against cracking, peeling, bubbling, delamination, or demetallization when properly installed and maintained on suitable substrates.

B. Installer's Warranty: Installer's standard form in which installer agrees to repair or replace safety and security control films that do not comply with requirements or fail in workmanship within the specified warranty period and shall be included with the contract for installation.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Johnson Laminating & Coating Inc.; 20701 Annalee, Carson, CA 90746; (310) 635-4929; www.johnsonlaminating.com

B. Substitutions: Not allowed

2.2 DESCRIPTION

A. Trident: Optically clear, anti-fragmentation protective polymeric film, with an abrasion resistant coating on one side and a mounting adhesive on the other.

1. Uniformity: No noticeable visual defects, such as pinholes, streaks, thin spots, scratches, or banding in accordance with the IWFA visual acceptance standard, after installation.

2. Variation in Solar Specifications across Width: +/- 3 % average at any portion of the length.

3. Thickness: Nominal 5 mils (127 microns) with no evidence of coating voids, after the removal of the release liner.

4. Identification: Labeled in accordance with manufacturer's specifications.

2.3 SAFETY AND SECURITY FILM PERFORMANCE CRITERIA

A. General: Performance specifications represent film mounted to 1/4 inch (6mm) clear glass, unless noted otherwise.

B. Trident S4DN35:

1. Film Color: Neutral

2. Film Gauge: 0.005

3. Plies: 2

4. Visible Light Transmission: 37%.

5. UV Reduction: 99%.

5. ASTM D882 - Tensile Stress

Coated Product:
Machine Direction: 22,900 PSI
Transverse Direction: 32,600 PSI

Base Films: 4 mil polyester
Machine Direction: 27,000 PSI
Transverse Direction: 29,000 PSI

ASTM D882 – Break Strength

Machine Direction: 96 PLI
Transverse Direction: 137 PLI

ASTM D882 - % Elongation at Break

Coated Product:
Machine Direction: 102%
Transverse Direction: 99%

Base Film: 4 mil polyester
Machine Direction range: 180%
Transverse Direction range: 140%

7. Peel Strength: ASTM D3330: >5 lbs/inch.

8. Puncture Strength: ASTM D2582: > 65 lbs.

9. Haze Change: ASTM D1044: < 4.4%

10. Impact Tests:

a. ANSI Z97.1: 2004: Class B

b. 16 CFR 1201 US Gov. Standard Test: CAT I

c. BS 6206; 1981: Class B

d. EN12600 Pendulum Test: Class 2B.

11. Combustion Tests: ASTM E84-98 Surface Burning Test

a. Smoke Density: 20

b. Flame Spread Rating (NFPA Class A • UBC Class 1): 5

c. Time to Ignite: 205 seconds

d. Flame Front: 1 foot maximum

e. Rate of Burning: 0.1 in/sec.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine glazing system for upgrade viability prior to installation of window film.

B. Verify satisfactory glass quality, sufficient edge bite and spacing, and elasticity of gasket material. Glass substrate should be free of defects, imperfections or damage of any kind including broken, chipped, cracked, or abraded areas.

C. Verify frame and gasket are of satisfactory condition so as to not interfere with installation or typical thermal expansion and contraction of glazing system.

D. Any unsatisfactory conditions must be corrected prior to proceeding with installation.

3.2 PREPARATION

A. Comply with manufacturer's instructions for recommended surface preparation, cleaning and protection of the entire fenestration system.

B. Prior to installation, clean glass thoroughly. Use mounting solution (recommended content: one capful of baby shampoo to 1 gallon of water) along with tools such as; squeegees, scrub pads, lint free towels and scrapers to ensure the glass surface is clean and smooth.

1. Ensure surface is free of any decals, debris, and dirt.
2. Clean frames and gasket material with towels and solution.
3. Use a final "spray and squeegee" cleaning to control dust as needed.

C. Protect window frames and adjacent surfaces to prevent damage from water used during cleaning and installation. Use towels, tape, drop cloths and any other means recommended by manufacturers of adjacent materials to protect floors, walls and frames.

3.3 SAFETY AND SECURITY FILM APPLICATION

A. Install window film in accordance with manufacturer instructions.

B. Thoroughly clean and dry glazing system.

C. Cut film neatly and square to a slightly larger size than the exposed glass area.

D. Remove release liner and spray both adhesive and glass surface with mounting solution to permit positioning on glass. Place film with adhesive side on glass, ensuring entire glass surface is covered.

E. Spray outside surface with solution and squeegee film into place working from the center outward and from the top down, stopping a few inches from the edges.

F. For a daylight installation trim film to align with edges of exposed glazing, leaving approximately 1/16" to 1/8" gap from the edge of the film to the gasketing of the window system to permit edge lay down. Use sharp blades recommended for this purpose. Replace blade after approximately 4 cuts.

G. If using an anchoring system, trim film to appropriate size, larger than glass surface, as specified by the manufacturer of the retention system.

H. Repeat spraying and squeegee procedure, vigorously moving water from center to right and left edges working from top down to bottom.

I. "Bump" edges by applying firm pressure to force water out the edge using a hard card wrapped with a paper towel to ensure anchorage of the film edges..

J. Once installation is complete, clean work area thoroughly.

K. While some water may remain between the film and glass surface for up to 30 days, excessive amounts must be addressed immediately according to manufacturer's instructions.

3.4 SITE QUALITY CONTROL

A. After installation and dry out period, film shall meet the IWFA visual acceptance standard. In general, the film shall appear uniform and unobtrusive when viewed from 10 feet. The film shall be free of physical defects such as wrinkles, creases, cuts or pinholes. The edges shall be consistent and appropriately distanced from frame.

B. If installed film does not meet visual acceptance standard criteria, remove and replace with new film.

3.5 CLEANING

A. Dry and thoroughly clean work area.

B. Window film may be cleaned with standard household glass cleaners following the 30 day dry out period. Do not use abrasives or chemicals not specifically intended for glass. The soap based mounting solution described above is recommended.

Soft cloths or synthetic sponges are recommended; use a squeegee for removing the solution.

C. Construction Waste Management: Manage construction waste in accordance with provisions of Division 1 Section 'Construction Waste Management'.

D. Replace damaged safety and security film before substantial completion.

END OF SECTION