



SECTION 08625

TUBULAR DAYLIGHTING SYSTEM

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**** NOTE TO SPECIFIER ** Solatube International, Inc.; residential and commercial reflective tube skylights.**

This section is based on the products of Solatube International, Inc., which is located at:
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2210 Oak Ridge Way
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[[Click Here](#)] for additional information.

Solatube Daylighting Systems (DS) use advanced optics to significantly improve the way daylight is harnessed. Solatube International has added breakthrough technology throughout the system to capture more sunlight on the roof, transfer more sunlight through the tubing and effectively diffuse the light in the building interior. Solatube Daylighting Systems set performance standards never seen before. Highly effective and simple to install, these models can transform dark interior rooms and light more expansive spaces when used in multiples, creating a unique architectural effect.

Solatube Daylighting Systems can accommodate virtually any ceiling configuration including suspended ceilings, finished drywall ceilings, and open ceilings making them appropriate for a wide variety of commercial and residential applications, including office, retail, warehouse, industrial, education, healthcare facilities, multifamily housing, and custom homes. These Daylighting Systems provide significant energy savings, improved environments, and high-quality lighting.

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PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Tubular daylighting system, consisting of roof dome, reflective tube, and diffuser assembly; configuration as indicated on the drawings.

**** NOTE TO SPECIFIER ** Delete the following paragraph if no daylight dimmers, security bars, light fixtures or ventilation accessories are specified.**

- B. Accessories.

1.2 RELATED SECTIONS

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

- A. Section 07311 - Asphalt Shingles: Flashing of skylight base.
- B. Section 07320 - Roof Tiles: Flashing of skylight base.
- C. Section 07510 - Built-Up Bituminous Roofing: Flashing of skylight base.
- D. Section 07530 - Electrometric Membrane Roofing: Flashing of skylight base.
- E. Section 07550 - Modified Bituminous Membrane Roofing: Flashing of skylight base.
- F. Section 08620 - Unit Skylights: Skylights without reflective tube.
- G. Section 08630 - Metal Framed Skylights.
- H. Section 16150 - Equipment Wiring: Electrical connections.
- I. Section 16500 - Lighting Equipment and Controls.

1.3 REFERENCES

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

- A. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2001.
- B. ASTM A 463/A 463M - Standard Specification for Steel Sheet, Aluminum Coated, by the Hot Dip Process; 2001a.
- C. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc Coated (Galvanized), by the Hot Dip Process; 2001a.
- D. ASTM E 283 - Test Method for Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
- E. ASTM E 308-95 - Standard Practice for Computing the Colors of Objects by Using the CIE System
- F. ASTM E 330 - Structural Performance of Exterior Windows, Curtain Walls and Doors.
- G. ASTM E 331 - Test Method for Water Penetration of Exterior Windows, Curtain walls and Doors by Static Air Pressure Difference.
- H. ASTM D 635 - Test Method for Rate of Burning and/or Extent of Time of Burning of Self-Supporting Plastics in a Horizontal Position.
- I. ASTM D-1929 - Test Method for Ignition Properties of Plastics.
- J. UL 181 - Factory Made Air Ducts and Air Connectors; 1998
- K. UL 790 - Standard for Tests for Fire Resistance of Roof Covering Materials; 1997.
- L. ICBO/ICC AC-16 - Acceptance Criteria for Plastic Skylights; 2003.

1.4 PERFORMANCE REQUIREMENTS

- A. Completed tubular daylighting system assemblies shall be capable of meeting the following performance requirements:
1. Air Infiltration Test: Air infiltration will not exceed .30 cfm/sf aperture with a pressure delta of 1.57 psf across the tube when tested in accordance with ASTM E 283.
 2. Water Resistance Test: No uncontrolled water leakage at 16.5 psf pressure differential with water rate of 5 gallons/hours/sf when tested in accordance with ASTM E 331.
 3. Uniform Load Test:

**** NOTE TO SPECIFIER ** Select the following Paragraph for use with Solatube Model 160 DS or 290 DS. Delete if not required.**

- a. No breakage, permanent damage to fasteners, hardware parts, or damage to make system inoperable or cause permanent deflection of any section in excess of 1 percent of its span at a Positive Load of 110 psf (5.27 kPa) or Negative Load of 60 psf (2.87 kPa).
 - b. All units shall be tested with a safety factor of (3) for positive pressure and (2) for negative pressure, acting normal to plane of roof in accordance with ASTM E 330.
4. Fire Testing:
- a. Class B Burning Brand - The burning brand shall self-extinguish without transferring the fire to the dome Per: U.B.C. Standard 15-2 Class B Burning Brand Test. See ASTM E 108 and UL 790.
 - b. Self-Ignition Temperature - Greater than 650 degrees F Per: U.B.C. Standard 26-6. See ASTM D-1929-68 (1975).
 - c. Smoke Density - Rating no greater than 75 Per: U.B.C. Standard 26-5. (See ASTM D-2843-70) or no greater than 450 Per U.B.C. 8-1 (See ASTM Standard E 84-91A) in way intended for use.
 - d. Rate of Burn - Minimum Burning Rate: 2.5 inches/min (64 mm/min) Classification CC-2: U.B.C. Standard 26-7. See ASTM D 635-74.

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. Shop Drawings.
- D. Verification Samples: As requested by Architect.
- E. Test Reports: Independent testing agency or evaluation service reports verifying compliance with specified performance requirements.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Engaged in manufacture of tubular skylights for minimum 10 years.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.

- B. Store and dispose of solvent-based materials, and materials used with solvent-based 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. Tubular Daylighting System: Manufacturer's standard warranty for 10 years.

**** NOTE TO SPECIFIER ** Delete if optional electric components are not required.**

- B. Electrical Parts: Manufacturer's standard warranty for 5 years, unless otherwise indicated.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Solatube International, Inc.; 2210 Oak Ridge Way, Vista, CA 92081. ASD. Toll Free: (888) 765-2882. Tel: (760) 477-1120. Fax: (760) 597-4488. Email: commsales@solatube.com. Web: www.solatube.com.

**** NOTE TO SPECIFIER ** Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.**

- B. Substitutions: Not permitted.
- C. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 TUBULAR DAYLIGHTING SYSTEM

- A. Tubular Daylighting System General : Transparent roof-mounted skylight dome and self-flashing curb, reflective tube, and ceiling level diffuser assembly, transferring sunlight to interior spaces; complying with ICBO/ICC AC-16.

- B. Brighten Up Series: Solatube Model 160 DS, 10 Inch (250 mm) Daylighting System.

**** NOTE TO SPECIFIER ** Acrylic Shock Inner Dome meets Florida Building Code High Velocity Wind Zone requirements. Use Shock Inner Domes only in high velocity wind zones.**

1. Roof Dome Assembly: Transparent, UV and impact resistant dome with flashing base supporting dome and top of tube.
 - a. Outer Dome Glazing: 0.125 inch (3 mm) minimum thickness injection molded acrylic classified as CC2 material and meeting characteristics of DR-101 blend.
 - b. Optional Shock Inner Dome Glazing: 0.115 inch (2.9 mm) minimum thickness high impact injection molded acrylic required for high velocity wind zones.
 - c. Raybender 3000: Prismatic pattern molded into dome to capture low angle sunlight.
 - d. LightTracker Reflector: Aluminum sheet, thickness 0.015 inch (0.4 mm) with Spectralight Infinity. Positioned in dome to capture low angle sunlight.

2. Flashing Base: One piece, seamless, leak-proof flashing functioning as base support for dome and top of tube.
 - a. Base Material: Sheet steel, corrosion resistant, meeting ASTM A 653/A 653M or ASTM A 463/A 463M, 0.028 inch (0.7 mm) thick.

**** NOTE TO SPECIFIER ** Delete one of the following two paragraphs. Steel bases are available both flat and pitched. For a different roof slope use the base that is the closest fit but be aware that the dome will not be mounted precisely level.**

- b. Base Pitch (Slope): Flat, no pitch 4 inches (102 mm) and 6 inches (152 mm) high.
 - c. Base Pitch (Slope): 22.5 degrees slope from horizontal.
3. Dome Ring: Attached to top of base section; 0.090 inch (2.3 mm) nominal thickness injection molded high impact acrylic; to prevent thermal bridging between base flashing and tubing and channel condensed moisture out of tubing.
4. Reflective Extension Tube: Aluminum sheet, thickness 0.015 inch (0.4 mm).
 - a. Interior Finish: Spectralight Infinity high reflectance specular finish on exposed reflective surface Visible spectrum (400 nm to 760 nm) greater than 99 percent. Total solar spectrum (400 nm to 2500 nm) less than 93 percent.
 - b. Color: a* and b* (defined by CIE L*a*b* color model) shall not exceed plus 2 or be less than minus 2 as determined in accordance to ASTM E 308.
 - c. Tube Diameter: Approximately 10 inches (250 mm).
5. Reflective 30 degree Adjustable tube: Aluminum sheet, thickness .015 inch (0.4 mm)
 - a. Interior Finish: Spectralight Infinity high reflectance specular finish on exposed reflective surface Visible spectrum (400 nm to 760 nm) greater than 99 percent. Total solar spectrum (400 nm to 2500 nm) less than 93 percent.

**** NOTE TO SPECIFIER ** The following paragraph is optional. Delete if not required.**

6. Reflective 90 degree Adjustable tube: Aluminum sheet, thickness .018 inch (0.5 mm)
 - a. Interior Finish: Spectralight Infinity high reflectance specular finish on exposed reflective surface Visible spectrum (400 nm to 760 nm) greater than 99 percent. Total solar spectrum (400 nm to 2500 nm) less than 93 percent.
7. Ceiling Ring: Injection molded, impact resistant acrylic. Nominal thickness is 0.110 inches.
8. Dress Ring: Injection molded, impact resistant acrylic. Nominal thickness is 0.100 inches. Prevents air infiltration and condensation from attic spaces.
9. Dual Glazed Diffuser Assembly:
 - a. Upper Glazing: Acrylic plastic classified as CC2. The nominal thickness is 0.040 inches (1.02 mm).

**** NOTE TO SPECIFIER ** Delete one of the following two paragraphs.**

- b. Lower Glazing (Optiview Fresnel Lens): Molded polycarbonate plastic classified as CC1 material. The nominal thickness is 0.022 inches (0.61 mm).
 - c. Lower Glazing (Vusion): Acrylic plastic classified as CC2. The nominal thickness is 0.090 inches (2.29 mm).

**** NOTE TO SPECIFIER ** The following accessories are optional. Delete if not required.**

10. Accessories:
 - a. Lighting Fixture for 160 DS Model: Bracket mounted inside system just above diffuser; UL listed.

**** NOTE TO SPECIFIER ** Delete one of the following two paragraphs. Note that lamps are not provided with fixture.**

- 1) Type: For 100 W incandescent lamp, ceramic screw-in lamp holder, medium base, one lamp.
- 2) Type: Dedicated compact fluorescent fixture, for one 26 W, 2-pin lamps.
- 3) Electrical Requirements: 110 V, 15 amp GFCI circuit for damp and wet conditions.

**** NOTE TO SPECIFIER ** The following paragraph is optional.**

- 4) Contractor to furnish lamps.
- b. Exhaust Fan: Permanently lubricated in-line fan motor, 110 cfm (52 L/s) capacity.
 - 1) Exhaust Duct: Flexible, Class 1, in accordance with UL 181.
 - 2) Air Intake: Injection molded impact resistance acrylic with trim to fit installation conditions.

**** NOTE TO SPECIFIER ** Vent cap is optional, delete if not required.**

- 3) Exhaust Vent Cap: Low-profile roof cap.

**** NOTE TO SPECIFIER ** Delete one of the following two paragraphs.**

- 4) Electrical Requirements: 110 V; install fan on same switch as internal light fixture.
- 5) Electrical Requirements: 110 V; wall switch.
- c. Daylight Dimmer for 160 DS Model: Electro-mechanically actuated daylight valve; for universal input voltages ranging between 90 and 277 V at 50 or 60 Hz; actuator rated at 0.1 amp per unit; controlled by low voltage, series circuited, 4 conductor, size 22 cable, and low voltage DC DP/DT switch; providing daylight output between 2 and 100 percent.
- d. Tile Roof Counter-Flashing: corrugated aluminum 1100-0, .020 inch (.508mm).

**** NOTE TO SPECIFIER ** Select one of the following four paragraphs and delete those not required. If more than one size is required indicate requirements on the Drawings.**

- e. Flashing Turret Extensions: Provide manufacturer's standard extensions for applications requiring:
 - 1) Additional lengths of 2 inches (50 mm) extension.
 - 2) Additional lengths of 4 inches (100 mm) extension.
 - 3) Additional lengths of 12 inches (300 mm) extension.
 - 4) Additional lengths of 24 inches (600 mm) extension.
 - 5) Additional lengths of 36 inches (900 mm) extension.
 - 6) Additional lengths of 48 inches (1200 mm) extension.

2.3 ACCESSORIES

- A. Fasteners: Same material as metals being fastened, non-magnetic steel, non-corrosive metal of type recommended by manufacturer, or injection molded nylon.
- B. Sealant: Polyurethane or copolymer based elastomeric sealant as provided or recommended by manufacturer.

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 printed instructions.
- B. After installation of first unit, field test to determine adequacy of installation. Conduct water test in presence of Owner, Architect, or Contractor, or their designated representative. Correct if needed before proceeding with installation of subsequent units.

3.4 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION