



## SECTION 08625

### TUBULAR DAYLIGHTING DEVICE

Display hidden notes to specifier. (Don't know how? [Click Here](#))

#### GENERAL

- 1.1 SECTION INCLUDES
  - A. Tubular daylighting device.
  - B. Accessories.
- 1.2 RELATED SECTIONS
  - A. Section 07311 - Asphalt Shingles: Flashing of skylight base.
  - B. Section 07320 - Roof Tiles: Flashing of skylight base.
  - C. Section 07500 – Membrane Roofing: Flashing of skylight base.
  - D. Section 07510 - Built-Up Bituminous Roofing: Flashing of skylight base.
  - E. Section 07530 - Electrometric Membrane Roofing: Flashing of skylight base.
  - F. Section 07550 - Modified Bituminous Membrane Roofing: Flashing of skylight base.
  - G. Section 07600 – Flashing and Sheet Metal: Metal curb flashings.
  - H. Section 08620 - Unit Skylights: Skylights without reflective tube.
  - I. Section 08630 - Metal Framed Skylights.
  - J. Section 13800 – Building Automation Controller.
  - K. Section 16500 – Lighting Equipment and Controls: Light bulbs and lamps.
- 1.3 REFERENCES
  - A. ASTM B 209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
  - B. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2008a.
  - C. ASTM A 463/A 463M - Standard Specification for Steel Sheet, Aluminum Coated, by the Hot Dip Process; 2006.

- D. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc Coated (Galvanized), by the Hot Dip Process; 2007.
- E. ASTM A 792/A 792M – Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process
- F. ASTM E 108 - Standard Test Methods for Fire Tests of Roof Coverings.
- G. ASTM E 283 - Test Method for Rate of Air Leakage through Exterior Windows, Curtain Walls, and Doors under Specified Pressure Differences across the Specimen; 2004.
- H. ASTM E 308 - Standard Practice for Computing the Colors of Objects by Using the CIE System; 2006.
- I. ASTM E 330 - Structural Performance of Exterior Windows, Curtain Walls and Doors; 2002.
- J. ASTM E 547 - Test Method for Water Penetration of Exterior Windows, Skylights, Doors and Curtain walls by Cyclic Air Pressure Difference; 2000.
- K. ASTM E 1886 - Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials.
- L. ASTM E 1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricane
- M. ASTM D 635 - Test Method for Rate of Burning and/or Extent of Time of Burning of Self-Supporting Plastics in a Horizontal Position; 2006.
- N. ASTM D 1929 - Test Method for Ignition Properties of Plastics; 1996 (2001).
- O. ASTM D 2843 – Standard Test Method for Density of Smoke from the Burning or Decomposition of Plastics.
- P. ASTM F 1642-12 – Standard Test Method for Glazing and Glazing Systems Subject to Airblast Loading
- Q. AAMA/WDMA/CSA 101/I.S.2/A440 - Standard/Specification for Windows, Doors, and Unit Skylights; 2011
- R. FM Standard 4431 – Factory Mutual (FM) Approvals standard for Skylights, addressing product testing and rating relative to the Spread of Flame Test for Skylights from an exterior Ignition Source, Simulated Severe Hail Resistance Test using 2 inch Freezer Balls (Pre-UV Exposure), Simulated Impact Test for Skylights, Simulated Wind Uplift Test for Skylights, and Simulated Severe Hail Resistance Test using 2 inch Freezer Balls (Post-UV Exposure 1000 hour UV exposure).
- S. UL 2108 - Low Voltage Lighting Systems

- T. GSA-TS01-2003: Standard Test Method for Glazing and Window Systems Subject to Dynamic Overpressure Loadings
- U. Unified Facilities Criteria (UFC) 4-010-01, Change October 2013, DoD Minimum Antiterrorism Standards for Buildings
- V. CSA C22.2 No. 250.0 – Luminaires.
- W. ICC AC-16 - Acceptance Criteria for Plastic Skylights; 2008.
- X. Florida Building Code TAS 201 – Impact Test Procedures.
- Y. Florida Building Code TAS 202 – Criteria for Testing Impact and Non-Impact Resistant Building Envelope Components Using Uniform Static Air Pressure Loading.
- Z. Florida Building Code TAS 203 – Criteria for Testing Products Subject to Cyclic Wind Pressure Loading
- AA. IBC Section 1710 - Load Test Procedure for Wind Load Testing on Rooftop Daylight Collecting System - Structural Performance Testing - Devised by ATI PE); 2012
- BB. IBC Section 2606.7.2 – Installation – Diffuser Fall Out Test (Devised by PE); 2012
- CC. NFRC 100 - Procedure for Determining Fenestration Product U-factors; 2014
- DD. OSHA 29 CFR - 1910.23 (e)(8) (Guarding Requirements for Skylights); 1926 Subpart M (Fall Protection); 1926.501(b)(4)(i); 1926.501(i)(2); 1926.501(b)(4)(ii)
- EE. California State OSHA Fall Protection Code of Regulations, Title 8, Section 3212 (e)(1)

#### 1.4 PERFORMANCE REQUIREMENTS

- A. Completed tubular daylighting device assemblies shall be capable of meeting the following performance requirements:
  1. Air Infiltration Test:
    - a. Air infiltration will not exceed 0.30 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:
    - a. Passes water resistance; no uncontrolled water leakage with a pressure differential of 10.7 psf (512 Pa) or 15 percent of the design load (whichever is greater) and a water spray rate of 5 gallons/hour/sf for 24 minutes when tested in accordance with AAMA/WDMA/CSA 101/I.S.2/A440-11, ICC-ES AC-16, ASTM E 547 and ASTM E 331
  3. Uniform Load test:
    - a. 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.
    - b. No breakage, permanent damage to fasteners, hardware parts, or damage to make daylighting system inoperable or cause excessive permanent deflection of any section when tested at a Positive Load of 150 psf (7.18 kPa) or Negative Load of 70 psf (3.35 kPa).

4. Hurricane Resistance:
  - a. Cyclic Wind Pressure Loading:
    - 1) Meets Florida Building Code TAS, 201, TAS, 202 and TAS 203 for Impact and non-impact components.
    - 2) Meets ASTM E 1886 and ASTM E1996 for missile and cyclic pressure differential testing.
  
5. FM Standard 4431:
  - a. Spread of Flame: Passes: Class A at 5 in12. No flame spread when tested in accordance with FM modified version of ASTM E108 Fire Test of Roof Coverings.
  - b. Simulated Hail Resistance (Pre UV Exposure): Passes: No cracking or breaks when tested with nominal 2.0 in. (51 mm) diameter ice ball having a kinetic energy of 26.8 ft-lbs (36.4J)
  - c. Simulated Hail Resistance (Post UV Exposure): Passes: No cracking or breaks when tested with nominal 2.0 in. (51 mm) diameter ice ball having a kinetic energy of 26.8 ft-lbs (36.4J) after no less than 1000 hours of ultraviolet (UV) light exposure.
  - d. Simulated Impact: Passes: No breakage or through openings when a 100 lb (45.5 kg) weight dropped from 4 ft (1.2 m) above highest point of test sample.
  - e. Simulated Wind Uplift: Passes: 195 psf Wind Rating. No separation, breaking or cracking occurred when tested in accordance with FM 4431.
  
6. Fire Testing:
  - a. Fire Rated Roof Assemblies:
    - 1) When used with the Dome Edge Protection Band, all domes meet fire rating requirements as described in the International Building Code.
    - 2) Self-Ignition Temperature - Greater than 650 degrees F per ASTM D-1929.
    - 3) Smoke Density: Rating no greater than 450 per ASTM Standard E 84 in way intended for use. Classification C.
    - 4) Rate of Burn and/or Extent: Maximum Burning Rate: 2.5 inches/min (62 mm/min) Classification CC-2 per ASTM D 635.
    - 5) Rate of Burn and/or Extent: Maximum Burn Extent: 1 inch (25 mm) Classification CC-1 per ASTM D 635.

## 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. Submit shop drawings showing layout, profiles and product components, including anchorage, flashings and accessories.
  
- D. LEED Submittals: Provide documentation of how the requirements of Credit will be met:
  1. List of Daylight Credits available for the products specified.

2. Data on Energy Optimization Performance Credits for the products specified.
3. Data on Perimeter and Non-Perimeter Controllability of Systems for use of Daylight Dimmer option with the products specified.
4. Data on potential Innovation in Design Credits which may be available for the innovative use of the products specified.

#### 1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Engaged in manufacture of tubular daylighting devices for minimum 20 years.
- B. LED equipment certified and labeled by UL and CSA labels.

#### 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. Daylighting Device: Manufacturer's standard warranty for 10 years.
- B. Electrical Parts: Manufacturer's standard warranty for 5 years, unless otherwise indicated.
- C. LED Emitters, Drivers and Controls: Manufacturer's standard warranty for 3 years against failure.

### PART 2 PRODUCTS

#### 2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Solatube International, Inc.; 2210 Oak Ridge Way, Vista, CA 92081. ASD. Tel. Toll Free: 888-765-2882. Tel: (760) 477-1120. Fax: (760) 597-4488. Email: [commsales@solatube.com](mailto:commsales@solatube.com). Web: [www.solatube.com](http://www.solatube.com).
- B. Substitutions: Not permitted.
- C. Requests for substitutions will be considered in accordance with provisions of Section 01600.

#### 2.2 TUBULAR DAYLIGHTING DEVICES

- A. Tubular Daylighting Devices General: Transparent roof-mounted skylight dome and self-flashing curb, reflective tube, and ceiling level diffuser assembly, transferring sunlight to interior spaces; complying with ICC AC-16.
- B. SolaMaster Series: Solatube Model 330 DS-O Open Ceiling, 21 inch (530 mm) Daylighting System:
1. Roof Dome Assembly: Transparent, UV and impact resistant dome with flashing base supporting dome and top of tube.
    - a. Glazing: Type DA, 0.143 inch (3.7 mm) minimum thickness injection molded acrylic classified as CC2 material; UV inhibiting (100 percent UV C, 100 percent UV B and 98.5 percent UV A), impact modified acrylic blend.
    - b. Glazing: Type DPI, 0.115 inch (3 mm) minimum thickness polycarbonate classified as CC1 material. **Component required for FM 4431 approval.**
    - c. LightTracker Reflector, made of aluminum sheet, thickness 0.015 inch (0.4 mm) with Spectralight Infinity. Positioned in the dome to capture low angle sunlight.
  2. Roof Flashing Base:
    - a. One Piece: One piece, seamless, leak-proof flashing functioning as base support for dome and top of tube. Sheet steel, corrosion resistant conforming to ASTM A 653/A 653M or ASTM A 463/A 463M, or ASTM A 792/A792 M, 0.028 inch (0.7 mm) plus or minus .006 inch (.015 mm) thick.
      - 1) Base Style: Type F4, Self Mounted, 4 inches (102 mm) high.
      - 2) Base Style: Type F8, Self Mounted, 8 inches (203 mm) high. **Optional component required for FM 4431 approval.**
      - 3) Base Style: Type F11, Self Mounted, 11 inches (279 mm) high. **Optional component required for FM 4431 approval.**
      - 4) Base Style: Type FC, Curb cap, with inside dimensions of 27 inches by 27 inches (685 mm by 685 mm) to cover curb as specified in Section 07600. **Optional component required for FM 4431 approval.**
    - b. Two Piece: Two-piece, inverted flange Metal Roof Flashing for Standing Seam Rib roof profile with greater than 14-3/8 inch (365 mm) minimum distance between ribs permitting a required greater than 2 inch (51 mm) clearance between flashing and rib: Type FSM. Aluminum 1060 Alloy, corrosion resistant conforming to ASTM B 209, 0.059 inch (1.5 mm) thick.
  3. Flashing Insulator: Type FI, Thermal isolation material for use under the following flashing types; Type F4, F8, or F11.
  4. Curb Insulator: Type CI, Thermal isolation material is for use under flashing Type FC.
  5. Curb Cap Insulation: Type CCI, Nominal 1 inch thick thermal insulation pad to reduce thermal conduction between curb-cap and tubing and thermal convection between room air and curb-cap. Rated R-6 ( $^{\circ}\text{F}\cdot\text{ft}^2\cdot\text{hr}/\text{Btu}$ ) Insulation is Polyisocyanurate foam utilizing CFC, HCFC, & HFC free blowing agent. Type-1 Class-1 per ASTM C 1289; Passes UL 1715 (15-minute thermal barrier per IBC 2603.4); Attic ventilation may be required per IBC 1203.2( $^{\circ}\text{F}\cdot\text{ft}^2\cdot\text{hr}/\text{Btu}$ )
  1. Dome Edge Protection Band: Type PB, for fire rated Class A, B or C roof applications. Galvanized steel. Nominal thickness of 0.039 inch (1 mm). For use with Self Mount Flashing Types F4, F8, and F11 Flashings, and 330DS

domes on Curb Cap Flashings, only. **Component required for FM 4431 approval.**

2. Roof Flashing Turret Extensions: Provide manufacturer's standard extensions for applications requiring:
  - a. Type T12: Additional lengths of 12 inches (300 mm) extension.
  - b. Type T24: Additional lengths of 24 inches (600 mm) extension.
  - c. Type T36: Additional lengths of 36 inches (900 mm) extension.
  - d. Type T48: Additional lengths of 48 inches (1200 mm) extension.
3. Membrane Counter Flashing: Type MCF, one piece, seamless, spun Aluminum Alloy 1100, functioning as a counter flashing for use with membrane roof material (supplied by others). Corrosion resistant conforming to ASTM B 209, 0.059 inch (1.5mm) thick. **Optional Membrane Counter Flashing component for use with Self Mounted flashing Types: F8, or F11.**
4. Tube Ring: Attached to top of base section; 0.090 inch (2.3 mm) nominal thickness injection molded high impact PVC; to prevent thermal bridging between base flashing and tubing and channel condensed moisture out of tubing.
5. Tube Ring Seal: Attached to the base of the dome ring; butyl glazing rope, 0.24 inch (6 mm) diameter; to minimize air infiltration.
6. Dome Seal: Adhesive backed weatherstrip, 0.63 inch (16 mm) tall by 0.28 inch (7 mm).
7. Reflective Tubes: Aluminum sheet, thickness 0.018 inch (0.5 mm).
  - a. General:
    - 1) Interior Finish: Spectralight Infinity with Cool Tube Technology combining ultra-high Visible Light reflectance with Ultra-low Infrared (IR) reflectance. Patented spectrally-selective optical surface yields specular reflectance greater than 99 percent for the Visible Light spectrum (400 nm to 760 nm) and less than 20% reflectance for Infrared (IR) wavelengths longer than 980nm, resulting in a spectrally-selective Total Solar Spectrum (400 nm to 2500 nm) less than 80.2 percent.
    - 2) 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.
  - b. Top Tube Angle Adapter, Type TA:
    - 1) Reflective 45 degree adjustable Top Tube Angle Adapter, 16 inches (406 mm) long.
  - c. Bottom Tube Angle Adapter, Type BA:
    - 1) Reflective 45 degree adjustable Bottom Tube Angle Adapter, 16 inches (406 mm) long
  - d. Top Tube Angle Adapter and Bottom Tube Angle Adapter Kit, Type AK:
    - 1) Reflective 45 degree adjustable top and bottom angle adapters (one each), 16 inches (406 mm) long
  - e. Extension Tube:
    - 1) Reflective extension tube, Type EXX, Notched for Open Ceiling diffuser attachment, 24 inches (610 mm) or 48 inches (1220 mm) long.
  - f. Reflective 90 degree Adjustable tube:
    - 1) Extension Tube Angle Adapter: Provide manufacturer's standard adapters for applications requiring:

- (a) Type A1: one 0 to 90 degree extension tube angle adapter.
  - (b) Type A2: two 0 to 90 degree extension tube angle adapters.
8. Diffuser Assemblies for Tubes Not Penetrating Ceilings (Open Ceiling): Solatube Model 330 DS-O. 21 inch (530 mm) diameter diffuser attached directly to bottom of tube.
- a. Lens: Type L1 OptiView Fresnel lens design to maximize light output and diffusion. Visible Light Transmission shall be greater than 90 percent at 0.022 inch (0.6 mm) thick. Classified as CC2.
  - b. Lens: Type L2, Prismatic lens designed to maximize light output and diffusion. Visible Light Transmission shall be greater than 90 percent at 0.100 inch (2.5 mm) thick. Classified as CC2.
  - c. Diffuser Seal: Open cell foam, acrylic adhesive backed, 0.75 inch (19 mm) wide by 0.125 inch (3.2 mm) thick to minimize condensation and bug, dirt and air infiltration per ASTM E 283.
  - d. Diffuser Trim Ring: Injection molded acrylic. Nominal wall thickness 0.172 inches (4.4 mm).
  - e. Secondary Diffuser: Type SS, Acrylic plastic classified as CC2 material. Thickness shall not be less than 0.100 inches.
9. Accessories:
- a. Security Bar: Type B Security Bar 0.375 inch (95 mm) stainless steel bar across flashing diameter opening.
  - b. Security Kit: Type SK Dome Security Kit, rivets with nylon spacers to replace dome screws.
  - c. Open ceiling trim ring: Type R, ABS Plastic, White; nominal thickness of 0.04 inches (1 mm).
  - d. Wire Suspension Kit: Type E, Use the wire suspension kit when additional bracing to the structure is required.
  - e. Local Dimmer Control utilizing a butterfly baffle design of Spectralight Infinity reflective material to minimize shadowing when in use: Provided with dimmer switch and cable.
    - 1) Daylight Dimmer: Type D Electro-mechanically actuated daylight valve; for universal input voltages ranging between 90 and 277 V at 50 or 60 Hz; maximum current draw of 50 ma per unit; controlled by low voltage, series Type T02: circuited, 4 conductor, size 22 AWG when total aggregate circuit runs are under 200 feet (60.96 m) or size 18 AWG when total aggregate circuit runs are under 500 feet (152.4 m); providing daylight output between 2 and 100 percent. Provided with dimmer switch and cable.
    - 2) Switch: Type SW, Manufacturer-specific low voltage DC DP/DT switch (white) required to operate Daylight Dimmer. Note: only one switch is required per set of synchronously controlled dimmers. For use with Daylight Dimmer, Type D, only. Pre-wired with 30 feet (9.14 m) of 22 AWG, 4 conductor, low voltage cable.
    - 3) Cable: Type CA, Optional Two conductor, size 22 AWG, low voltage cable (500 foot) for multiple unit DC connection. For use with Daylight Dimmer, Type D, only when aggregate circuit runs do not exceed 200 feet (60.96 m).
  - f. 0 to 10 V Dimmer Control: Low Voltage Daylight Dimmer, Type D1, is an Electro-mechanically actuated daylight valve; 0-10 V Control, Class-2, UL Listed. Low voltage Daylight Dimmer provides for



programmable (0 to 10VDC) scene-based dimming control for daylight output between 2 and 100 percent, auxiliary 12VDC dimming control for daylight output between 2 and 100 percent, or auxiliary ON/OFF control. Input voltage: 24VAC at 50 or 60 Hz.

- 1) Programmable (0 to 10VDC) Control: requires lighting controller or building automation controller capable of producing a signal between 0 and +10 VDC (Min 50mA) to incrementally modulate up to 50 daisy chained Daylight Dimmers (Current Sinking or Current Sourcing) between fully closed at 0 to 1 volts to fully open at 9 to 10 volts. **Note: Coordinate with Lighting Controller specified in Section 16500 or Building Automation Controller specified in Section 13800.**
  - (a) 0 to 10 VDC control requires CL-2 (Min), 18 AWG, stranded copper, two conductor, twisted cable from lighting controller to first dimmer and interconnecting between subsequent dimmers.
- 2) Auxiliary ON/OFF Control: requires commercial or residential single pole electric light switch.
  - (a) ON/OFF control requires CL-2 (Min), 22 AWG, stranded, three conductor, twisted cable from switch to first dimmer and CL-2 (Min), 18 AWG, stranded copper, two conductor, twisted cable; interconnecting subsequent dimmers.
- 3) Control Cable: Aggregate Length not to exceed 2,110 feet (643 m). Voltage drop not to exceed (0.5 VDC) between first unit output and last unit input. The control wires are polarity and input/output sensitive, accuracy is important in wiring.
- 4) Power Cable: requires CL-2 (Min), 16 AWG, stranded, three conductor, cable from transformer to first 0-10 V dimmer and interconnecting between subsequent 0-10 V dimmers.
- 5) Power can be transformed from line voltage through use of a UL Listed Class-2, 24VAC Transformer, with a maximum recommended cable length (spacing) not to exceed 30 feet (9,144 mm) between units and aggregate power cable length of 450 feet (137.2m). Maximum number of Daylight Dimmer Units per transformer is as follows.
  - (a) Solatube 330/750DS Units: A maximum of 3 Daylight Dimmers can be connected to each 20VA Class-2 Transformer (Type TR20); and a maximum of 11 Daylight Dimmers can be connected to each 96VA Class-2 Transformer (Type TR96).
- 6) Low Voltage Daylight Dimmer, Type D1, primary circuit current draw when powered by a 24VAC transformer at 120VAC:
  - (a) Primary Circuit (120VAC) Current Draw for each Solatube model 330/750DS Low Voltage Daylight Dimmer: Static Closed position current draw of 19mA; Static Open position current draw of 25mA; Maximum Operating current draw of 46mA.

NOTE: Lighting controller, auxiliary switch(s), and cable provided by others; optional 20VA remote transformer, Type TR20, and optional 96VA remote transformer, Type TR96, are available from Solatube International, Incorporated.

10. Options/Accessories

- a. Thermal Insulation Panel: Type TIP, high-performance dual-glazed, thermally-broken tube insulation system consisting of two acrylic panels, spaced 1.0 inch (25.4 mm) apart, classified CC2 Class C material, 0.110 inch (2.8 mm) thick, housed in a polyethylene terephthalate glycol-modified (PETG) or acrylonitrile butadiene styrene (ABS) band classified as CC2 material 0.060 inch (1.5 mm) thick by 1.75 inch (44.5 mm) high with Spectralight Infinity high reflectance specular finish interior surface, and assembled with stainless steel disk spacers 0.0197 inch (0.5 mm) thick and aluminum rivets 0.13 inch (3.2 mm) fastened periodically around the perimeter.
- b. Optional Low-voltage Transformer: Solatube Remote Transformer, Type TR20, is a 20VA, 24VAC, 50/60HZ, UL Listed, UL Category XOKV7, CE Marked, Class-2 Transformer with cover plate mounting system configured for easy field assembly onto standard 4.06 inch by 4.06 inch (103 mm by 103 mm) square junction box: Inherently Limited, Primary: 120VAC, 208VAC, 240VAC, and 277VAC.
- c. Optional Low-voltage Transformer: Solatube Remote Transformer, Type TR96, is a 96VA, 24VAC, 50/60HZ, UL Listed, UL Category XOKV7, CE Marked, Class-2 Transformer with cover plate mounting system configured for easy field assembly onto standard 4.06-in x 4.06-in (103mm x 103mm) square junction box: Inherently Limited, Primary: 120VAC, 240VAC, 277VAC and 480VAC.

## 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. Suspension Wire: Steel, annealed, galvanized finish, size and type for application and ceiling system requirement.
- C. 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.
- C. Coordinate requirements for power supply, conduit and wiring.

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.
- C.    Inspect installation to verify secure and proper mounting. Test each fixture to verify operation, control functions, and performance. Correct deficiencies.

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