

## SECTION 08 62 00

INSULATED TRANSLUCENT PANEL SKYLIGHTS  
04/06

## PART 1 GENERAL

## 1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

## AMERICAN ARCHITECTURAL MANUFACTURERS ASSOCIATION (AAMA)

AAMA 1600 (2000) Voluntary Specification for Skylights

## ASTM INTERNATIONAL (ASTM)

ASTM C 297/C 297M (2004) Flatwise Tensile Strength of Sandwich Constructions

ASTM D 1002 (2005) Apparent Shear Strength of Single-Lap-Joint Adhesively Bonded Metal Specimens by Tension Loading (Metal-to-Metal)

ASTM D 1003 (2000) Haze and Luminous Transmittance of Transparent Plastics

ASTM D 1037 (2006a) Evaluating Properties of Wood-Base Fiber and Particle Panel Materials

ASTM D 3841 (1997; R 2001) Standard Specification for Glass-Fiber-Reinforced Polyester Plastic Panels

ASTM D 572 (2004) Rubber Deterioration by Heat and Oxygen

ASTM E 108 (2007a) Fire Tests of Roof Coverings

ASTM E 283 (2004) Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen

ASTM E 331 (2000) Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference

ASTM E 72 (2005) Conducting Strength Tests of Panels for Building Construction

## NATIONAL FENESTRATION RATING COUNCIL (NFRC)

NFRC 100	(2004) Procedure for Determining Fenestration Product U-Factors
NFRC 200	(2004) Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence

## 1.2 GENERAL REQUIREMENTS

The Contractor shall furnish and install commercially available unit skylights which satisfy all requirements contained in this section and have been verified by load testing and independent design analyses (if required) to meet specified design requirements. The Contractor shall provide environmentally preferable products and work practices, applicable to skylights, considering raw materials acquisition, production, manufacturing, packaging, distribution, reuse, operation, maintenance, and/or disposal of the products or services used in the skylights. The skylight system shall be UV-stabilized, shatter proof and energy efficient. The plastics used in the manufacture of the skylights shall be light transmitting plastics for daylighting applications.

## 1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

## SD-02 Shop Drawings

## Shop Drawings; G, AE

Drawings showing fabrication details, materials, dimensions, installation methods, anchors, and relationship to adjacent construction.

## SD-03 Product Data

## Skylight Panels

Manufacturer's descriptive data and catalog cuts.

## Warranty

Manufacturer's 5 year complete warranty.

## SD-06 Test Reports

## Test Reports; G, AE

Certified test reports from independent testing laboratory for each type and class of panel system. Reports shall verify that the material meets specified performance requirements. Previously completed test reports will be acceptable if they are current and indicative of products used on this project. Where a Class A, B

or C roof is part of the project, a listing certificate for roof covering systems category shall be provided certifying that the product complies with the safety standards of **ASTM E 108** and the Uniform Building Code.

#### SD-07 Certificates

##### Skylight Panels; G, AE

Manufacturer's certificate stating that products meet or exceed specified requirements. Skylight system shall be evaluated and listed (the whole skylight as a unit, not just a glazing material in the unit) by the recognized building code authorities: ICC and SBCCI-Public Safety Testing and Evaluation Services Inc. Product ratings determined using **NFRC 100** and **NFRC 200** shall be authorized for certification and properly labeled by the manufacturer.

##### Qualifications

Documentation of manufacturer's and installer experience indicating compliance with specified requirements.

#### 1.4 QUALIFICATIONS

The manufacturer shall be a company specializing in the manufacture of the specified products with a minimum of 5 years documented experience. The installer shall have documented experience of 5 years minimum performing the work specified.

#### 1.5 DELIVERY STORAGE AND HANDLING

System modules shall be factory assembled to the greatest extent possible. Panels shall be shipped to the jobsite in rugged shipping units and shall be ready for erection. All skylights shall have conspicuous decals affixed warning individuals against sitting or stepping on the units. Skylight panels shall be stored on the long edge, several inches above the ground, blocked and under cover to prevent warping. Unit skylights shall be delivered in manufacturer's original containers, dry, undamaged, with seals and labels intact. All products shall be delivered, stored and protected in accordance with manufacturer's recommendations.

#### 1.6 WARRANTY

The Contractor shall provide to the Government the manufacturer's complete warranty for materials, workmanship, and installation. The warranty shall be for 5 years from the time of project completion and shall not be prorated. The warranty shall guarantee, but shall not be limited to, the following:

- a. Light transmission and color of the panels shall not change after 5-year exposure at a low angle of 5 degrees in South Florida.
- b. There is no delamination of the panel affecting appearance, performance, weatherability or structural integrity of the panels or the completed system.
- c. There is no fiberbloom on the panel face.
- d. Change in light transmission of no more than 6% per **ASTM D 1003**,

and in color (yellowing index) no more than 10 points in comparison to the original specified value over a 10 year period.

## PART 2 PRODUCTS

### 2.1 SKYLIGHT PANELS

Skylight panels shall be fabricated of panels conforming to the specified requirements and other appropriate lab test specified criteria, weighing not less than 8 ounces/square foot. The Contractor shall submit Test Reports as specified in the Submittals paragraph. Size and color of skylight panels shall be as indicated.

### 2.2 GLASS-FIBER PANELS

Glass-fiber reinforced polyester panels shall conform to ASTM D 3841, Class I and to the requirements of AAMA 1600.

#### 2.2.1 Weatherability

The exposed faces of fiberglass sandwich type panels shall have a permanent glass veil erosion barrier embedded integrally to provide maximum long term resistance to reinforcing fiber exposure. The exterior face sheet shall be uniform in strength and be resistant to penetration by pencil point.

#### 2.2.2 Non Combustible Grid Core

The aluminum I-beams shall be 6063-T6 with provisions for mechanical interlocking of muntin-mullion and perimeter to prevent high and low intersections which do not allow full bonding surface to contact with face material. Width of I-beam shall be no less than 7/16 inch. I-beam grid shall be machined to tolerances of not greater than plus or minus 0.002 inch for flat panels. Panels shall withstand 1200 degrees F fire for a minimum of one hour without collapse or exterior flaming.

#### 2.2.3 Adhesive

The laminate adhesive shall be heat and pressure resin-type engineered for structural sandwich panel use. Adhesive shall pass testing requirements specified by the International Conference of Building Officials' "Acceptance Criteria for Sandwich Panel Adhesive". Minimum strength shall be:

- a. Tensile Strength of 750 psi in accordance with ASTM C 297/C 297M after two exposures to six cycles each of the aging conditions prescribed in ASTM D 1037.
- b. Shear Strength, after exposure to five separate aging conditions in accordance with ASTM D 1002, shall be:
  - (1) 540 psi at 50% relative humidity and 73 degrees F.
  - (2) 800 psi under accelerated aging per ASTM D 1037 at room temperature.
  - (3) 250 psi under accelerated aging per ASTM D 1037 at 182 degrees F.
  - (4) 1400 psi after 500 hour Oxygen Bomb per

ASTM D 572.

(5) 100 psi at 182 degrees F.

#### 2.2.4 Panel Construction

Panels shall consist of fiberglass faces laminated to an aluminum I-beam grid core and shall deflect no more than 1.9 inches at 30 psf in 10 feet per ASTM E 72, without a supporting frame. Quality control inspections and required testing, conducted at least once each year, shall include manufacturing facilities, sandwich panel components and production sandwich panels for conformance with "Acceptance Criteria for Sandwich Panels" as regulated by the ICC-ES or equivalent.

### 2.3 PANEL REQUIREMENTS

#### 2.3.1 Appearance

The face sheets shall be uniform in color to prevent splotchy appearance. Faces shall be completely free of ridges and wrinkles which prevent proper surface contact. Clusters of air bubbles/pinholes which collect moisture and dirt are not acceptable.

#### 2.3.2 Panel Fabrication

Panel construction shall meet the following requirements: Light transmission 20%; shading coefficient 0.22; color white.

#### 2.3.3 Thermal Performance

Thermal transmittance for skylights shall not exceed a U-factor of 0.29 Btu/hr-ft<sup>2</sup>-F when determined using NFRC 100.

### 2.4 SKYLIGHT SYSTEMS

The skylight systems shall meet the following requirements:

- a. Integral perimeter framing system assembly shall be by the manufacturer.
- b. Exterior panel faces shall be crystal in color. Interior panel faces shall be white in color.
- c. Air infiltration at 6.24 psf shall be less than 0.1 cfm/ft<sup>2</sup> in accordance with ASTM E 283.
- d. Water penetration at test pressure of 15 psf shall be zero in accordance with ASTM E 331.
- e. Manufacturer shall be responsible for maximum system deflection, in accordance with the applicable building code, and without damage to system performance. Deflection shall be calculated in accordance with engineering principles.
- f. Proper weepage elements shall be incorporated within the perimeter framework of the glazing system for drainage of any condensation or water penetration.
- g. System shall accommodate movement within the system; movement

between the system and perimeter framing components; dynamic loading and release of loads; and deflection of supporting members. This shall be achieved without damage to system or components, deterioration of weather seals and fenestration properties specified.

h. The exterior panel face shall repel an impact of 60 foot-pounds without fracture or tear when impacted by a 3.5 inch diameter, 6.37 pound free falling ball. Impact strength shall be measured by the Society of Plastics Industries (SPI) method.

i. Exposed aluminum color shall be selected from the manufacturer's standard range. Corrosion resistant finish shall be oven dried Kynar 500, two coats.

j. The system shall require no scheduled recoating to maintain its performance or for UV resistance.

k. Design criteria shall be: As indicated on the structural drawings.

l. Extruded aluminum shall be 6063-T6 and 6063-T5; all fasteners shall be stainless steel or cadmium plated steel.

## 2.5 Pre-Fabricated Curbs

As specified in Section 07 53 23, EPDM ROOFING.

## 2.6 FLEXIBLE SEALING TAPE

Sealing tape shall be manufacturer's standard pre-applied to closure system at the factory under controlled conditions.

# PART 3 EXECUTION

## 3.1 PREPARATION

The Contractor shall verify when structural support is ready to receive all specified work and to convene a pre-installation conference, if approved by the Contracting Officer, including the Contractor, skylight installer and all parties directly affecting and affected by the specified work. All submitted opening sizes, dimensions and tolerances shall be field verified; preparation of openings shall include isolating dissimilar materials from aluminum system to avoid damage by electrolysis. The installer shall examine area of installation to verify readiness of site conditions and to notify the Contractor about any defects requiring correction. Work shall not commence until conditions are satisfactory.

## 3.2 ERECTION

Translucent skylight system shall be erected in accordance with the approved shop drawings supplied by the manufacturer. Fastening and sealing shall be in accordance with the manufacturer's shop drawings. All panel protection shall be removed and, after other trades have completed work on adjacent materials, panel installation shall be carefully inspected and adjusted, if necessary, to ensure proper installation and weather-tight conditions. All staging, lifts and hoists required for the complete installation and field measuring shall be provided. System shall be installed clean of dirt, debris or staining and thoroughly examined for

removal of all protective material prior to final inspection of the designated work area.

-- End of Section --