

SECTION 08 45 23  
INSULATED TRANSLUCENT FIBERGLASS SANDWICH PANEL SYSTEM

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section includes the insulated translucent sandwich panel system as shown and specified. Work includes providing and installing:
  - 1. Flat (curved) factory prefabricated structural insulated translucent sandwich panels.
  - 2. Aluminum installation system
  - 3. Aluminum sill flashing
  - 4. Sealants and caulking for the frame to the brick masonry opening.
- B. Related Sections:
  - 1. Masonry: Section 04 20 00

**1.2 SUBMITTALS**

- A. Submit manufacturer's product data. Include construction details, material descriptions, profiles and finishes of components.
- B. Submit shop drawings. Include elevations, details and dimensions.
- C. Submit manufacturer's color charts showing the full range of colors available for factory finished aluminum.
  - 1. When requested, submit samples for each exposed finish required, in same thickness and material indicated for the work and in size indicated below. If finishes involve normal color variations, include sample sets consisting of two or more units showing the full range of variations expected.
    - a. Sandwich panels: 14" x 28" units
    - b. Factory finished aluminum: 5" long sections
- D. Submit Installer Certificate, signed by installer, certifying compliance with project qualification requirements.
- E. Submit product test reports from a qualified independent testing agency indicating each type and class of panel system complies with the project performance requirements, based on comprehensive testing of current products. Previously completed test reports will be acceptable if for current manufacturer and indicative of products used on this project.
  - 1. Test reports required are:

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- a. Flame Spread and Smoke Developed (UL 723) - Submit UL Card
- b. Burn Extent (ASTM D 635)
- c. Color Difference (ASTM D 2244)
- d. Abrasion/Erosion Resistance (ASTM D 4060)
- e. Impact Strength (UL 972)
- f. Bond Tensile Strength (ASTM C 297 after aging by ASTM D 1037)
- g. Bond Shear Strength (ASTM D 1002)
- h. Beam Bending Strength (ASTM E 72)
- i. Panel Insulation U-Factor (NFRC 100)

**1.2 SUBMITTALS (continued)**

- j. NFRC System U-Factor Certification
- k. Solar Heat Gain Co-efficient
- l. Condensation Resistance Factor (AAMA 1503)
- m. Class 1 Fire Approval (FM 4881) (Optional)

F. Submit current documentation indicating regular, independent quality control monitoring under a nationally recognized building code review and listing program.

**1.3 QUALITY ASSURANCE**

**A. Manufacturer's Qualifications**

- 1. Material and products shall be manufactured by a company continuously and regularly employed in the manufacture of specified materials for a period of at least ten (10) consecutive years and which can show evidence of those materials being satisfactorily used on at least six (6) projects of similar size, scope and location. At least three (3) of the projects shall have been in successful use for ten (10) years or longer.
- 2. Panel system must be listed by the International Code Council - Evaluation Service (ICC-ES) which requires quality control inspections and fire, structural and water infiltration testing of sandwich panel systems by an approved agency.
- 3. Quality control inspections shall be conducted at least once each year and 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.

B. Installer's Qualifications: Installation shall be by an experienced installer, which has been in the business of installing specified panel systems for at least two (2) consecutive years and can show evidence of satisfactory completion of projects of similar size, scope and type.

C. Performance Requirements: The manufacturer shall be responsible for the configuration and fabrication of the complete panel system.

1. When requested, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

#### **1.4 DELIVERY STORAGE AND HANDLING**

- A. Deliver panel system, components and materials in manufacturer's standard protective packaging.
- B. Store panels on the long edge; several inches above the ground, blocked and under cover in accordance with manufacturer's storage and handling instructions.

#### **1.5 WARRANTY**

- A. Submit manufacturer's and installer's written warranty agreeing to repair or replace panel system work which fails in materials or workmanship within one (1) year of the date of delivery. Failure of materials or workmanship shall include leakage, excessive deflection, deterioration of finish on metal in excess of normal weathering and defects in accessories, insulated translucent sandwich panels and other components of the work. (Contact local representative for extended warranty periods.)

### **PART 2 - PRODUCTS**

#### **2.1 MANUFACTURER**

- A. Kalwall Corporation, tel: (800) 258-9777 - fax: (603) 627-7905 - email: [info@kalwall.com](mailto:info@kalwall.com)

#### **2.2 PANEL COMPONENTS**

- A. Face Sheets
  1. Translucent faces: Manufactured from glass fiber reinforced thermoset resins, formulated specifically for architectural use.
    - a. Thermoplastic (e.g. polycarbonate, acrylic) faces are not acceptable.
    - b. Face sheets shall not deform, deflect or drip when subjected to fire or flame.
    - c. Face sheets shall not delaminate when exposed to 200°F for 30 minutes per IBC or 300°F for 25 minutes.
  2. Interior face sheets:
    - a. Flamespread: Underwriters Laboratories (UL) listed, which requires periodic unannounced retesting, with flamespread rating

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no greater than 50 (20) and smoke developed no greater than 250 (200) when tested in accordance with UL 723/ASTM E 84.

b. Burn extent by ASTM D 635 shall be no greater than 1".

3. Exterior face sheets:

a. Color stability: Full thickness of the exterior face sheet shall not change color more than 3.0 (5.0) CIE Units DELTA E by ASTM D 2244 after 5 (3) years outdoor South Florida weathering at 5 degrees facing south, determined by the average of at least three (3) white samples with and without a protective film or coating to ensure long-term color stability. Color stability shall be unaffected by abrasion or scratching.

b. Erosion Resistance: Exterior face shall have a permanent glass erosion barrier embedded beneath the surface to provide long-term resistance to reinforcing fiber exposure. Exterior face surface loss shall not exceed .7 mils and 40 mgs when tested in accordance with ASTM D 4060 employing CS17 abrasive wheels at a head load of 500 grams for 1000 cycles.

c. Strength: Exterior face sheet shall be uniform in strength, impenetrable by hand held pencil and repel an impact equal to 70 (230) ft. lbs. without fracture or tear when impacted by a 3-1/4"

diameter, 5 lb. free-falling ball per UL 972.

4. Appearance:

a. Exterior face sheets: Smooth, 0.070" thick and opaque in color.

b. Interior face sheets: Smooth, 0.045" thick and opaque in color.

c. Face sheets shall not vary more than +/- 10% in thickness and be uniform in color.

B. Grid Core

1. Thermally broken (aluminum) I-beam grid core shall be of 6063-T6 or 6005-T5 alloy and temper with provisions for mechanical interlocking of muntin-mullion and perimeter. Width of I-beam shall be no less than 7/16". The I-beam grid shall be machined to tolerances of not greater than +/- .002".

2. I-beam Thermal break: Minimum 1", thermoset. Urethane poured and de-bridged is not acceptable.

C. Laminate Adhesive

1. Heat and pressure resin type adhesive engineered for structural sandwich panel use, with minimum 25-years field use. Adhesive shall pass testing requirements specified by the International Code Council "Acceptance Criteria for Sandwich Panel Adhesives."

2. Minimum tensile strength of 750 PSI when the panel assembly is tested by ASTM C 297 after two (2) exposures to six (6) cycles each of the aging conditions prescribed by ASTM D 1037.

3. Minimum shear strength of the panel adhesive by ASTM D 1002 after exposure to five (5) separate conditions:
  - a. 50% Relative Humidity at 68° F: 540 PSI
  - b. 182° F: 100 PSI
  - c. Accelerated Aging by ASTM D 1037 at room temperature: 800 PSI
  - d. Accelerated Aging by ASTM D 1037 at 182° F: 250 PSI

## 2.3 PANEL CONSTRUCTION

- A. Provide sandwich panels of flat fiberglass reinforced translucent face sheets laminated to a grid core of mechanically interlocking thermally broken (aluminum) I-beams. The adhesive bonding line shall be straight, cover the entire width of the I-beam and have a neat sharp edge.
  1. Thickness: 2-3/4" (4")
  2. Light transmission: Standard panel per manufacturer.
  3. Solar heat gain coefficient: Standard panel per manufacturer.
  4. Overall panel U-factor by NFRC certified laboratory: 2-3/4: thermally broken I-beam (0.23, 0.14, 0.10, 0.05) [OR 2-3/4: aluminum I-beam (0.53, 0.29, 0.22, 0.18) or 4" thermally broken I-beam (0.55, 0.15, 0.08).
  5. Complete insulated panel system shall have NFRC certified U-factor of 0.29.
  6. Grid pattern: Nominal 12" x 24" (8" x 20", 12" x 12", other) shoji (reverse shoji, square, staggered, Verti-Kal).
- B. Panels shall deflect no more than 1.9" at 30 psf in 10'-0" span without a supporting frame by ASTM E-72.
- C. Panels shall show evidence of withstanding 1200°F fire for minimum one (1) hour without collapse or flame penetration.
- D. Thermally broken panels:
  1. Minimum Condensation Resistance Factor of 80 by AAMA 1503 measured on the bond line.
  2. Minimum CRF of 90 at center of grid cell

## 2.4 BATTENS AND PERIMETER CLOSURE SYSTEM

- A. Closure system: Extruded aluminum 6063-T6 and 6063-T5 alloy and temper clamp-tite screw type closure system.
  1. (Optional) Thermally broken perimeter system shall have a urethane bridge.
  2. (Optional) Perimeter system shall be factory prefabricated "Superbreak" as shown on drawings.
  3. (Optional) Curved closure system may be roll formed.

4. (Optional) FM 4440 listed explosion venting system designed to release at design wind load plus 10 (+10 - 0) (between 20 psf + 40 psf).
- B. Sealing tape: Manufacturer's standard, pre-applied to closure system at the factory under controlled conditions.
- C. Fasteners: 300 series stainless steel screws for aluminum closures, excluding final fasteners to the building.
- D. Finish: Exposed aluminum to be manufacturer's factory applied finish that meets the performance requirements of AAMA 2604. (Mill)
  1. Color by Veteran's Administration (to be selected from manufacturer's standard colors).

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION**

- A. Examine substrates, supporting structure and installation conditions. Do not proceed with panel erection until unsatisfactory conditions have been corrected.

#### **3.2 PREPARATION**

- A. Metal Protection:
  1. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose.
  2. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint or method recommended by manufacturer.
  3. Where aluminum will contact pressure-treated wood; separate dissimilar materials by methods recommended by manufacturer.

#### **3.3 INSTALLATION**

- A. Install the panel system in accordance with the manufacturer's installation recommendations and approved shop drawings.
  1. Anchor component parts securely in place by permanent mechanical attachment system.
  2. Accommodate thermal and mechanical movements.
  3. Set perimeter framing in a full bed of sealant compound, or with joint fillers or gaskets to provide weather-tight construction.

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- B. Install joint sealants at perimeter joints and within the panel system in accordance with manufacturer's installation instructions.

#### 3.4 CLEANING

- A. Clean the panel system inside and outside, immediately after installation, according to manufacturer's written recommendations.

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