



## SECTION 07 42 13

### INSULATED METAL WALL PANELS

#### **ALPLY Insulated Panels**

#### **Alply CLASSIC WALL™ Architectural Insulated Panel Wall System**

### **PART 1 / GENERAL**

#### 1.1 SYSTEM DESCRIPTION

- A. Smooth, non-embossed steel, insulated metal wall panels
- B. Steel clips for panel attachment
- C. Sealants and extruded neoprene gasket for panel system

#### 1.2 REFERENCES

##### **A. American Society for Testing and Materials (ASTM)**

- 1. ASTM A653: Standard Specification for Steel Sheet, Zinc Coated or Zinc-Iron Alloy Coated by the Hot-Dip Process
- 2. ASTM C273: Shear Properties of Sandwich Core Materials
- 3. ASTM C518: Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmittance
- 4. ASTM D1621: Compressive Properties of Rigid Cellular Plastics
- 5. ASTM D1622: Apparent Density of Rigid Cellular Plastics
- 6. ASTM D1623: Tensile and Tensile Adhesion Properties of Rigid Cellular Plastics
- 7. ASTM D2126: Standard Test Method for Response of Rigid Cellular Plastics to Thermal And Humid aging
- 8. ASTM D2856: Standard Test Method for Open Cell Content of Rigid Cellular Plastics
- 9. ASTM E84: Standard Test Method for Surface Burning Characteristics of Building Materials
- 10. ASTM E283: Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
- 11. ASTM E330: Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights, Curtain Walls by Uniform Static Air pressure Difference
- 12. ASTM E331: Standard Test Method for Water Penetration of Exterior Windows, Doors, Skylights, Curtain Walls by Uniform Static Air pressure Difference

##### **B. National Fire Protection Association (NFPA)**

- 1. NFPA 285: Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load Bearing Wall Assemblies Containing Combustible Components.
- 2. NFPA 268: Standard Fire Test Method for Determining Ignitability of Exterior Wall Assemblies Using a Radiant Heat Energy Source Evaluation of Fire Propagation Characteristics of Exterior Non-Load Bearing Wall Assemblies Containing Combustible Components.

**C. FM Global (FM)**

1. FM Approval Standard 4880 – Class 1 Fire Rating of Insulated Wall, Ceiling and Roof Panels

**D. US Green Building Council (USGBC)**

1. USGB Leadership in Energy and Environmental Design (LEED) Green Building Rating System

**E. Underwriters Laboratory (UL)**

1. UL 723: Surface Burning Characteristics of Building Units

**F. Uniform Building Code (UBC)**

1. UBC 17-6: Multi-Story Fire Evaluation of an Exterior, Non load Bearing, Foam Plastic Insulated Wall System
2. UBC 26-4: Multi-Story Fire Evaluation of an Exterior, Non load Bearing, Foam Plastic Insulated Wall System  
UBC 26-9: Flammability Characteristics of Exterior Non Load Bearing Wall Assemblies Containing Combustible Components using the Intermediate Scale Multi-Story Test Apparatus.

**G. International Building Code (IBC): Current Edition****1.3 ADMINISTRATIVE REQUIREMENTS**

**A. Pre-installation Meeting:** Conduct a pre-installation meeting at the job site attended by Owner, Architect, Manufacturer's Representative and Panel Installer. Coordinate structural support requirements, and installation of any additional air/water barriers that relate to the insulated wall panel system.

**1.4 SUBMITTALS**

**A. Product Data:** Submit manufacturer current literature for the product type.

**B. Shop Drawings:** Submit detailed drawing for approval, showing:

1. Panel description
2. Gauge of metal skins
3. Layout of Panels
4. Panel Joint detail
5. Sealants and Gaskets
6. Trim detail

**C. Samples:** Provide the following samples:

1. Flat metal color swatches for each exterior color specified
2. Panel sample with joint and gasket

**D. LEED Submittals:**

1. Material and Resources (MR)
  - a. Product Certificate for Credit MR 4: For products having recycled content, provide calculation establishing weight per-cent of postconsumer and preconsumer with value in dollar terms of total recycled content

**E. Quality Assurance Submittals:**

1. Design Data, Test Reports: Provide manufacturer test reports indicating product compliance with requirements.
2. Manufacturer Erection Instructions: Provide manufacturer's written installation instructions including proper material storage and maintenance instructions.

**1.5 QUALITY ASSURANCE****A. Manufacturer Qualifications:**

1. Manufacturer shall have a minimum of five (5) years experience in the production of insulated metal wall panels. Manufacturer shall demonstrate past experience with projects of similar type and exposure.

**B. Installer Qualifications:**

1. Installer shall be approved by the manufacturer; installer to provide letter of approval.

**1.6 DELIVERY, STORAGE AND HANDLING**

- A. Deliver panels to the project site in manufacturer's original condition in fully protected crate.
- B. Store wall panels in accordance with the manufacturer's instructions (copy attached to each delivery crate). Do not store crates on top of each other.

**1.7 WARRANTY**

- A. Limited Warranty: Manufacturer agrees to repair or replace panels that suffer failure due to materials or workmanship within the specified warranty period.
  1. Warranty Period: Five (5) years from date of Substantial Completion or 5 years from the date of shipment from manufacturer's plant, whichever occurs first.
- B. Finish Warranty: Manufacturer agrees to repair or replace panels that exhibit deterioration of fluoropolymer finish beyond accepted norms when tested in accordance with ASTM D4214 and ASTM D2244.
  1. Warranty Period: Twenty (20) years from date of Substantial Completion or 20 years from the date of shipment from manufacturer's plant, whichever occurs first.



## PART 2 / PRODUCTS

### 2.1 MANUFACTURER

#### A. Alply Insulated Panels, LLC.

1. 1401 Eilerman Avenue, Litchfield, IL 62056; telephone (217) 324-6700

#### B. Alply CLASSIC WALL™ Architectural Insulated Panel Wall System

#### C. Substitution Limitations:

1. Submit written request for approval of substitutions to the Architect a minimum of 14 days prior to the date for receipt of bids. The following information must accompany any such request for consideration:
  - a. Name and description of the substitute product.
  - b. Test data in compliance with specification requirements.
  - c. Documentary proof of projects completed of similar type and scope.
2. After evaluation by Architect, a decision on approval will be issued by addendum only.
3. Substitutions following award of contract are not permitted except as otherwise allowed in Division 01.

### 2.2 EXTERIOR WALL PANELS

#### A. Panel Design Criteria

1. Panel shall be designed and manufactured to resist a wind load of \_\_\_\_\_ positive and negative loading.
2. Deflection Criteria shall be L/180, with a maximum of 3/4" when tested in accordance with ASTM E330, "Structural Design Load".

#### B. Panel Performance Criteria

1. Structural Test:  
Structural performance shall meet wind load criteria verified by test results obtained from physical testing conducted in accordance with ASTM E330.
2. Bond Strength:  
The tensile strength of the bond between the isocyanurate core and the metal faces must be a minimum of 27 psi. No delamination is allowed.
3. Water Penetration:
  - a. Static: There shall be no uncontrolled water leakage when tested in accordance with ASTM E331 at 7.0 psf with water spray rate of five (5) gallons per hour per sf minimum for fifteen (15) minutes.
4. Air Infiltration:
  - a. Air infiltration shall not exceed .06 cfm per sf for the fixed wall when tested in accordance with ASTM E283



- b. Weatherization:  
Demonstrate no deterioration in water leakage performance over time by simulated weatherization testing to ASTM E331. Panel samples must be placed in a chamber with a thermal load of 160 ° F on the hot side and -15° F on the cold side and the interior chamber stabilized at 68° F. The test will be discontinued after 3 cycles with each cycle maintained for two hours. No uncontrolled water leakage is acceptable.
5. Thermal:  
Polyisocyanurate (ISO) core panels shall provide the following R-Values as tested in accordance with ASTM C518:
- |                      |      |
|----------------------|------|
| [2] inch thick Flat: | R-14 |
| [3] inch thick Flat: | R-21 |
6. Fire Testing:
- Factory Mutual FM 4880 Full Scale Building Corner Test: The insulated panel system shall have FM approval as Specification Tested per ASTM E84 Test Method, and under Approval Standard 4480 for Class 1.
  - Factory Mutual FM 4880: The insulation core shall in itself have FM approval as Specification Tested per ASTM E84 Test Method, and under Approval Standard 4480 for Class 1.
  - ASTM E84 Surface Burning Characteristics: The insulating core shall have been tested in accordance with ASTM E84 for surface burning characteristics. The core shall have a maximum flame spread of 25 and a smoke developed rating of 450.
  - UL 723 Surface Burning Characteristics of Building Units: The insulating core shall have been tested in accordance with UL Test 723 (ASTM E84) for surface burning characteristics. The core shall have a maximum flame spread of 25 and a smoke developed rating of 450.
  - UBC 26-4 Multi Story Fire Evaluation: Exterior wall panel assembly shall meet the requirements of UBC 17-6 Multi-Story Fire Evaluation of an Exterior, Non Load –Bearing, Foam-Plastic Insulated Wall Panel.
  - NFPA 259-98 Potential Heat Source of Building Materials: The insulation core shall be tested to NFPA 259 and the heat content of the core established.
7. Insulating Core:  
The foam core shall be Polyisocyanurate (ISO) core, tested to meet or exceed the requirements of ASTM C591, environmentally friendly (Zero- ODP), CFC and HCFC free, with the following physical properties:
- Density Nominal: 2.1 pcf
  - Shear Strength: 27 psi
  - Compressive Strength: 26 psi
  - Tensile Strength: 33 psi
  - Closed Cell Content: 95 percent minimum
  - FM Global Content: Class 1 per FM 4880
  - Surface Burning Characteristics of un-faced foam core when tested in accordance with ASTM E84.
    - Flame Spread: less than 25
    - Smoke Developed: less than 195
  - Potential Heat Content per NFPA 259: 11,281 BTU/lb.
  - Appearance and Integrity: No voids or striations within the foam will be acceptable. The absence of voids and striations shall be proven by visual inspection of both the submittal sample and production samples.



### C. Exterior Paint Finish for Panels:

1. Exterior face sheet shall be treated with a nominal 0.2 mil (5 microns) base primer, followed by a nominal 0.7 mil (17.5 microns) finish coat of full strength 70% PVDF fluropolymer coating.
2. Interior sheet shall be a nominal 0.2 mil (5 microns) primer followed by a nominal 0.7 (17.5 microns) polyester coating.

### D. Panel Assembly:

1. Panel thickness: (inches) thick.
2. Panel width: Widths as indicated on architectural or shop drawings not to be restricted to manufacturer's standard modules.
3. Panel joint shall feature aluminum extrusions on the entire perimeter, attached mechanically to panel. Fabricated attachment clips are not acceptable as part of the panel system. The panel joint shall be sealed both by a bead of silicone between extrusions and an extruded silicone gasket, designed to lock into place within the extrusion assembly. A wet seal joint between panels is not acceptable. Panel joints may be recessed a minimum of \_\_\_\_ inches from the panel face or flush with panel face skin.
4. No field forming of panels to be allowed.
5. Exterior Face of Panel:
  - a. Material:
    - 1) Coil material shall be [Grade 33, G90 galvanized steel in accordance with ASTM A653] [AZ50 Galvalume® in accordance with ASTM A792].
    - 2) Gauge: [24 (steel)] [22 (steel)]
  - b. Profile:
    - 1) Aluminum face skin shall be smooth and flat.
    - 2) Flatness criteria shall be .010" in a 6" rule. No "oil canning" is acceptable.
  - c. Texture: Smooth no embossing is acceptable
  - d. Exterior Paint Finish Color:
    - 1) (Color as Selected by Architect and noted on drawings)
    - 2) Finish System:
      - a) (1.0 mil. Fluropolymer (PVDF) Two Coat system: 0.2 mil primer with 0.8 mil Kynar 500 (70 percent) SOLID color coat.)
      - b) (1.0 mil. Fluropolymer (PVDF) Two Coat system: 0.2 mil primer with 0.8 mil Kynar 500 (70 percent) MICA color coat.)
      - c) (1.5 mil. Fluropolymer (PVDF) Three Coat system: 0.2 mil primer with 0.8 mil Kynar 500 (70 percent) METALLIC color coat and .5 mil clear coat.)
6. Interior Face of Panel:
  - a. Material:
    - 1) Coil material shall be [Grade 33, G90 galvanized steel in accordance with ASTM A653] [AZ50 Galvalume® in accordance with ASTM A792].
    - 2) Gauge: 24 steel



- b. Profile: Standard flat, non-profiled
  - c. Texture: Smooth
  - d. Interior Finish: Modified polyester finish with a total minimum dry film thickness of 0.9 to 1.1 mil including primer.
    - 1) Color: Standard aluminum mill finish.
7. Insulating Core:  
Cured board stock, sanded flat, and fully inspected prior to lamination. Core material shall be polyisocyanurate (ISO).
8. Adhesive:  
Structural Urethane Adhesive, 100 percent solids and 100 percent solvent free.

## 2.3 ACCESSORIES

- A. Fasteners: Fasteners to be Climaseal coated or stainless steel as recommended by manufacturer.
- B. Trim: All metal trim shall be same gauge, material and coating color as exterior face of insulated metal panel.
- C. Gasket: Joinery gaskets shall be extruded, dry seal silicone at all horizontal panel joints. No wet seal joints shall be acceptable except at interface of panel and adjoining systems or dissimilar materials or as indicated on architects drawings. Gasket color shall be as noted on drawings; standard "black" or custom color as selected by architect.

## PART 3 / EXECUTION

### 3.1 EXAMINATION

- A. Provide field measurements to manufacturer as required to achieve proper fit of the insulated panel.
- B. Supporting Steel: All structural supports required for installation of panels shall be by others. Support members shall be installed within the following tolerances:
  - 1. Plus or minus 1/8 inch in 5 feet in any direction along plane of framing.
  - 2. Plus or minus 1/4 inch cumulative in 20 feet in any direction along plane of framing.
  - 3. Plus or minus 1/2 inch from framing plane on any elevation.
  - 4. Plumb or level within 1/8 inch at all changes of transverse for performed corner panel applications.
- C. Examine individual panels upon removing from the bundle; notify manufacturer of panel defects.



### 3.2 PANEL INSTALLATION

- A. Installation shall be in accordance with manufacturer's installation guidelines and recommendations.
- B. Install panels plumb, level, and true-to-line to dimensions and layout indicated on approved shop drawings.

### 3.3 TRIM INSTALLATION

- A. Place trim and trim fasteners only as indicated per details on the approved shop drawings.
- B. Field drill weep holes where appropriate in horizontal trim; minimum ¼ inch diameter at 24 inches on center.
- C. Place a continuous strip of butyl tube sealant on closure trims for the length of the panel to be covered by trim.

### 3.4 SEALANT INSTALLATION FOR EXPOSED JOINTS

- A. Clean and prime surfaces to receive exterior exposed sealants in accordance with sealant manufacturer's recommendations.
- B. Follow sealant manufacturer's recommendations for joint width-to-depth ratio, application temperature range, size and type of backer rod, and compatibility of materials for adhesion.
- C. Direct contact between butyl and silicone sealants shall not be permitted.

### 3.5 CLEANING AND PROTECTION

- A. Remove protective film immediately after installation.
- B. Touch-up, repair or replace metal panels and trim that have been damaged.
- C. After metal wall panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.

END OF SECTION