

*Specifiers: Click on the ¶ icon in the WORD toolbar to reveal detailed instructions*

**SECTION 07 42 13**  
**METAL WALL PANELS**  
Kingspan Insulated Panels  
Vale Insulated Wall Panel System

**PART 1 - GENERAL**

**1.1 SECTION INCLUDES**

- A. Steel faced, polyurethane (polyisocyanurate) metal wall panels.
- B. Accessories including fasteners and perimeter trim.

**1.2 REFERENCES**

- A. American Architectural Manufacturers Association (AAMA)
  - 1. AAMA 501.2: Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls and Sloped Glazing Systems.
- B. American Society of Civil Engineers (ASCE)
  - 1. ASCE 7: Minimum Design Loads for Buildings and Other Structures.
- C. ASTM International
  - 1. ASTM A653: Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
  - 2. ASTM A755: Standard Specification for Steel Sheet, Metallic Coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products
  - 3. ASTM A792: Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process
  - 4. ASTM A924: Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process
  - 5. ASTM B117: Standard Practice for Operating Salt Spray (Fog) Apparatus
  - 6. ASTM C273: Standard Test Method for Shear Properties of Sandwich Core Materials.
  - 7. ASTM C518: Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus

8. ASTM D522: Standard Test Methods for Mandrel Bend Test of Attached Organic Coatings
9. ASTM D523: Standard Test Method for Specular Gloss
10. ASTM D714: Standard Test Method for Evaluating Degree of Blistering of Paints
11. ASTM D968: Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive
12. ASTM D1308: Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes
13. ASTM D1621: Standard Test Method for Compressive Properties of Rigid Cellular Plastics
14. ASTM D1622: Standard Test Method for Apparent Density of Rigid Cellular Plastics
15. : Standard Test Method for Tensile and Tensile Adhesion Properties of Rigid Cellular Plastics
16. ASTM D1623: Standard Test Method for Tensile and Tensile Adhesion Properties of Rigid Cellular Plastics
17. ASTM D1929: Standard Test Method for Determining Ignition Temperature of Plastics
18. ASTM D2126: Standard Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging.
19. ASTM D2244: Standard practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates
20. ASTM D2247: Standard Practice for Testing Water Resistance of Coatings in 100 percent Relative Humidity
21. ASTM D2794: Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)
22. ASTM D3273: Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.
23. ASTM D3359: Standard Test Methods for Measuring Adhesion by Tape Test
24. ASTM D3363: Standard Test Method for Film Hardness by Pencil Test
25. ASTM D4145: Standard Test Method for Coating Flexibility of Prepainted Sheet
26. ASTM D4214: Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films
27. ASTM D5894: Standard Practice for Cyclic Salt Fog/UV Exposure of Painted Metal, (Alternating Exposures in a Fog/Dry Cabinet and a UV Condensation Cabinet)
28. ASTM D6226: Standard Test Method for Open Cell Content of Rigid Cellular Plastics.
29. ASTM E72: Standard Test Methods of Conducting Strength Tests of Panels for Building Construction
30. ASTM E84: Standard Test Method for Surface Burning Characteristics of Building Materials
31. 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

32. ASTM E330: Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference
33. ASTM E331: Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference
34. ASTM G153: Standard Practice for Operating Enclosed Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials
35. ASTM G154: Standard Practice for Operating Fluorescent Light Apparatus for UV Exposure of Nonmetallic Materials

D. International Building Code (IBC): current edition

E. National Fire Protection Agency (NFPA)

1. NFPA 259: Standard Test Method for Potential Heat of Building Materials.
2. NFPA 285: Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components.

F. International Organization for Standardization (ISO)

1. ISO 14025: Environmental Labels and Declarations

### 1.3 ADMINISTRATIVE REQUIREMENTS

- A. Pre-installation meeting: Conduct a pre-installation meeting at the job site attended by Owner, Architect, Manufacturer's Technical Representative, Panel Installer, and Contractors of related trades. Coordinate structural support requirements in relation to insulated wall panel system, installation of any separate air/water barriers, treatment of fenestration, and other requirements specific to the project.

### 1.4 SUBMITTALS

- A. Refer to Section [01 33 00 Submittal Procedures] [insert section number and title].
- B. Product Data: Submit manufacturer current technical literature for each type of product.
- C. Shop Drawings: Submit detailed drawings and panel analysis showing:
  1. Profile
  2. Gauge of both exterior and interior sheet
  3. Location, layout and dimensions of panels
  4. Location and type of fasteners
  5. Shape and method of attachment of all trim

6. Locations and type of sealants
  7. Installation sequence
  8. Coordination Drawings: Provide elevation drawings and building sections which show panels in relationship to required locations for structural support. Include panel details and details showing attachment to structural support.
  9. Other details may be required for a weathertight installation
- D. Panel Analysis: Provide panel calculations to verify panels will withstand the design wind loads indicated without detrimental effects or deflection exceeding the specified limit. Include effects of thermal differential between the exterior and interior panel facings and resistance to fastener pullout.
- E. Samples: Provide nominal 3 x 5 inch of each color indicated. **[Provide panel width by 8 inches long minimum] [Insert size].**
- F. LEED Submittals:
1. Energy and Atmosphere (EA)
    - a. Energy Analysis for Credit EA 1: Demonstrating percentage of performance improvement compared with the baseline building performance rating.
  2. Material and Resources (MR)
    - a. Product Certificates for Credit **[MR 4] [MR 4.1[and Credit MR 4.2]]**: For products having recycled content, documentation indicating percentages by weight of postconsumer and pre-consumer recycled content.
    - b. Product Certificates for Credit **[MR 5] [MR 5.1[and Credit MR 5.2]]**: For products and materials required to comply with requirements for regionally manufactured materials. Include statement indicating cost, location of manufacturer, and distance to Project for each regionally manufactured material.
  3. Indoor Environmental Quality (IEQ)
    - a. Product Data for Credit **[IEQ 4.1] [EQ 4.1]**: For sealants, including printed statement of VOC content
    - b. Product Data for Credit **[IEQ 4.2] [EQ 4.2]**: For paints and coatings, including printed statement of VOC content
  4. Innovation in Design (ID)
    - a. **[Documentation for Credit [ID 1] [ID 1.1]: [Include specific requirements related to documenting credit.]**

5. Pilot Credit 61: Certified Products

a. Material Disclosure and Assessment

G. Miscellaneous Certifications:

1. Submit documentation that products have been certified in accordance with ISO 14025.

H. 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, material handling, installation sequence, panel location(s), and attachment methods, details and required trim and accessories.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications:

1. Manufacturer shall have a minimum of five (5) years experience in the production of insulated wall panels. Manufacturer shall demonstrate past experience with examples of projects of similar type and exposure.
2. Manufacturer to be registered with a Program Operator with a Certified, Environmental Product Declaration, in conformance with ISO 14025, for Insulated Metal Panels.

- B. Installer Qualifications: Installer shall be authorized by the manufacturer and the work shall be supervised by a person having successfully completed a manufacturer training seminar regarding proper installation of the specified product.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Refer to Section [01 60 00 Product Requirements] [insert section number and title].
- B. Deliver panel materials and components in manufacturer's original, unopened, undamaged packaging with identification labels intact.
- C. Store wall panel materials on dry, level, firm, and clean surface. Stack no more than two bundles high. Elevate one end of bundle to allow moisture run-off, cover and ventilate to allow air to circulate and moisture to escape.

## 1.7 WARRANTY

- A. Limited Panel Warranty: Standard form in which manufacturer agrees to repair or replace items that fail in materials or workmanship within specified warranty period. Coverage under the warranty includes panel performance, bond integrity, deflection and delamination.
  - 1. Warranty Period: Two (2) years from date of Substantial Completion, or 2 years and 6 months from the date of shipment from manufacturer's plant, whichever occurs first.

*(Specifier Note: Finish warranty periods are limited by the coil coater and the coating manufacturer and the finish.)* Special Panel Finish Warranty: Submit Manufacturer's limited warranty on the exterior paint finish for adhesion to the metal substrate and limited warranty on the exterior paint finish for chalk and fade.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURER

- A. Kingspan Insulated Panels, Inc., 720 Marion Road, Columbus, Ohio 43207; 1-877-638-3266 (Toll Free) or 614-444-0110. (www.kingspanpanels.us)
- B. Basis of Design: Vale Series.
- 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] [Insert time period]**. Include the following information:
    - a. Name of the materials and description of the proposed substitute.
    - b. Drawings, cut sheets, performance and test data.
    - c. List of projects similar scope and photographs of existing installations.
    - d. Test reports indicating compliance with the performance criteria.
    - e. Other information necessary for evaluation.
  - 2. After evaluation by Architect, approval will be issued via addendum. No verbal approval will be given.
  - 3. Substitutions following award of contract are not allowed except as stipulated in Division 01 – General Requirements.

## 2.2 EXTERIOR WALL PANELS

### A. Performance Criteria:

1. Structural Test: Structural performance shall be verifiable by witnessed structural testing for simulated wind loads in accordance with ASTM E72 and E330. Deflection criteria shall be  $[L/180]$  [insert project specific deflection criteria].
2. Water Penetration: There shall be no uncontrolled water penetration through the panel joints at a pressure differential of 20 psf, when tested in accordance with ASTM E331.
3. Air Infiltration: Air infiltration through the panel shall not exceed 0.01 cfm/sf at 6.24 psf air pressure differential when tested in accordance with ASTM E283.
4. Humidity Test: Panels shall exhibit no delamination or metal interface corrosion when subjected to plus 140 deg. F temperature and 100 percent relative humidity for a total of 1500 hours (62 days).
5. Seismic Performance: Comply with ASCE 7, Section 13, "Seismic Design Requirements for Non-Structural Components". Panels shall be hard-fastened to structure along one edge only such that lateral slippage between panels can occur in the event of seismic activity.
6. Fire Test Response Characteristics: Steel-faced panels with polyisocyanurate (ISO) core shall fully comply with Chapter 26 of International Building Code regarding the use of Foam Plastic.
  - a. Flame Spread and Smoke Developed Tests on exposed Insulating Core:
    - 1) ASTM E84 Flame spread and smoke developed indices:
      - a) Flame Spread: 25 or less.
      - b) Smoke Developed: 90 or less.
  - b. FM 4880: Class I rated per FM Global, panels are approved for use without a thermal barrier and do not create a requirement for automatic sprinkler protection.
  - c. NFPA 259 Potential Heat Content; established for foam core.
  - d. NFPA 285 Intermediate Scale Multi-story Fire Evaluation; successfully passed acceptance criteria when installed per listed details.
  - e. UL1715 Fire Test of Interior Finish Material
  - f. ASTM D1929 Minimum Flash and Self Ignition; established for foam core.
7. Windborne Debris rating for Wall Panel:
  - a. Meet requirements for high velocity hurricane zone with large missile impact when tested in accordance with FM Standard 4881.
8. Insulating Core: Polyisocyanurate (ISO) core, ASTM C591 Type IV, CFC and HCFC free, compliant with Montreal Protocol and Clean Air Act, with the following minimum physical properties:

- a. Core is 95 percent closed cell when tested in accordance with ASTM D6226
- b. Panel shall provide a nominal R-values of 6.6 [hr·ft<sup>2</sup>·°F/Btu] per inch thickness when tested in accordance with ASTM C 518 at 75°F mean temperature and 7.2 [hr·ft<sup>2</sup>·°F/Btu] per inch thickness when tested in accordance with ASTM C 518 at 35°F mean temperature.
- c. Foam has a density of 2.2 to 2.8 pounds per cubic foot when tested in accordance with ASTM D1622
- d. Compressive Stress: Panels shall have a compressive stress of 31 psi. when tested according to ASTM D1621
- e. Shear Stress: 13 psi when tested in accordance with ASTM C273.
- f. Tensile Stress: 29 psi when tested in accordance with ASTM D1623.
- g. Oven Aging at 212 degrees F:
  - 1) 28 days: 0.02 percent volume change
  - 2) Tested according to ASTM D2126
- h. Low Temperature Aging at minus 40 degrees F:
  - 1) 28 days: minus 0.1 percent volume change
  - 2) Tested according to ASTM D2126

B. Paint Finish Characteristics:

- 1. Gloss: 15 ± 5 measured at 60 degree angle tested in accordance with ASTM D523.
- 2. Pencil Hardness: HB-H minimum tested in accordance with ASTM D3363.
- 3. Flexibility, T-Bend: 1-2T bend with no adhesion loss when tested in accordance with ASTM D4145.
- 4. Flexibility, Mandrel: No cracking when bent 180° around a 1/8 mandrel as tested in accordance with ASTM D522.
- 5. Adhesion: No adhesion loss tested in accordance with ASTM D3359.
- 6. Reverse Impact: No cracking or adhesion loss when impacted 3000 by inches of metal thickness (lb-in), tested in accordance with ASTM D2794.
- 7. Abrasion Resistance: Nominal 65 liters of falling sand to expose 5/32 inch diameter of metal substrate when tested in accordance with ASTM D968.
- 8. Graffiti Resistance: Minimal effect.
- 9. Acid Pollutant Resistance: No effect when subjected to 30 percent sulfuric acid for 18 hours, or 10 percent muriatic acid for 15 minutes when tested in accordance with ASTM D1308.
- 10. Salt Fog Resistance: Passes 1000 hours, when tested in accordance with ASTM B117 (5 percent salt fog at 95 deg. F).
- 11. Cyclic Salt Fog and UV Exposure: Passes 2016 hours when tested in accordance with ASTM D5894.
- 12. Humidity Resistance: Passes 1500 hours at 100 percent relative humidity and 95 deg. F, with a test rating of 10 when tested in accordance with ASTM D2247, and D714.
- 13. Color Retention: Passes 5000 hours when tested in accordance with ASTM G153 and G154.

14. Chalk Resistance: Maximum chalk is a rating of 8 when tested in accordance with ASTM D4214, Method A.
15. Color Tolerances: Maximum of 5ΔE Hunter units on panels when tested in accordance with ASTM D2244.

C. Exterior Aggregate Finish Characteristics:

1. Moisture Resistance: 14 days exposure with no deleterious effects when tested in accordance with ASTM D2247.
2. Salt Spray: 1000 hours, no deleterious effects when tested in accordance with ASTM B117.
3. Abrasion Resistance: 500 liters of sand, no deleterious effects when tested in accordance with ASTM D968.
4. Freeze/Thaw (60 cycles): No checking, cracking or splitting.
5. Mildew Resistance: No growth of mildew per ASTM D3273.
6. Flame Spread: less than 25, Class 1 rating when tested in accordance with ASTM E84.

D. Panel Assembly:

1. Panel thickness: [3 inches] [4 inches] thick.
2. Panel width: 36 inches.
3. Panel Lengths: [Minimum 8 feet,] [As indicated on Drawings].
4. Panel Attachment: Shall consist of fasteners and stainless-steel attachment clip completely concealed within the panel side joint.
5. Vertical Joint Treatments (for horizontal panels):
  - a. Panel end caps with black gasket insert
  - b. Surface mounted aluminum extrusion with reveal and [Flush] [Recessed] aluminum insert
  - c. Surface mounted top hat metal flashing
6. Exterior Face of Panel:
  - a. Material:
    - 1) Steel coil material shall be in accordance with ASTM A755: [AZ50 Galvalume®/ Zinalume® (55 percent aluminum, 45 percent zinc) in accordance with ASTM A792] [Grade 33, G90 galvanized steel in accordance with ASTM A653 and A924],
    - 2) Gauge: 22 gauge]
  - b. Profile: Vale
  - c. Texture: Non-directional stucco embossed [Smooth] [Heavy Embossed].
  - d. Exterior Paint Finish Color:

- 1) [Selected from current Kingspan Insulated Panels color chart] [Custom color as selected by Architect] [Color indicated].
- 2) Finish System:
  - a) [1.0 mil. Fluoropolymer (PVDF) Two Coat system: 0.2 mil primer with 0.8 mil Kynar 500 (70 percent) SOLID color coat.]
  - b) [1.0 mil. Fluoropolymer (PVDF) Two Coat system: 0.2 mil primer with 0.8 mil Kynar 500 (70 percent) MICA color coat.]
  - c) [1.5 mil. Fluoropolymer (PVDF) Three Coat system: 0.2 mil primer with 0.8 mil Kynar 500 (70 percent) METALLIC color coat and .5 mil clear coat.]
  - d) [2.4 mil. Fluoropolymer (PVDF) Three Coat system: 0.8 mil primer with 0.8 mil Kynar 500 (70 percent) SOLID color coat and 0.8 mil clear coat.]

7. Interior Face of Panel:

a. Material:

- 1) Steel coil material shall be in accordance with ASTM A755: [AZ50 Galvalume®/ Zinalume® (55 percent aluminum, 45 percent zinc) in accordance with ASTM A792] [Grade 33, G90 galvanized steel in accordance with ASTM A653 and A924] .

b. Profile: Standard flat, non-profiled.

c. Texture: Non-directional stucco embossed.

d. Gauge: [24 gauge] [22 gauge].

e. Interior Finish: [modified polyester, dry film thickness of 1.0 mil including primer.] [PVDF finish, dry film thickness of 1.0 mil including primer] [Vinyl Plastisol, 4.0 mil including primer].

- 1) Color: [USDA Imperial White] [Selected from the current Kingspan Insulated Panels stock color chart] [same as exterior finish] [Custom color as selected by Architect] [Color indicated].

## 2.3 ACCESSORIES

### A. Fasteners:

1. Self-drilling fasteners shall be corrosion resistant plated steel with neoprene washer, as recommended by manufacturer.
2. Material: Hex-head type with steel and neoprene washer and 12-gauge stainless steel clip supplied by the manufacturer.
3. Size: As recommended by manufacturer.

B. Perimeter Trim:

1. Fabricated perimeter trim and metal flashing: Shall be same gauge, material and coating color as exterior face of insulated metal wall panel.
2. Extruded perimeter trim: Shall be extruded aluminum 6063-T5 alloy with spray applied PVF coating in same color as exterior face of insulated metal wall panel.

C. Sealants: Butyl non-skinning/curing type, Elastomeric gasket, as recommended by manufacturer.

D. Butyl Tape: As recommended by manufacturer.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Provide field measurements to manufacturer as required to achieve proper fit of the preformed wall panel envelope. Measurements shall be provided in a timely manner so that there is no impact to construction or manufacturing schedule.
- 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 pre-formed corner panel applications.
  5. Verify that bearing support has been provided behind vertical joints of horizontal panel systems and horizontal joints of vertical panel systems. Width of support shall be as recommended by manufacturer.
- C. Examine individual panels upon removing from the bundle; notify manufacturer of panel defects. Do not install defective panels.

#### 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.

- C. Cut panels prior to installing, where indicated on shop drawings, using a power circular saw with fine tooth carbide tip blade per manufacturer's instructions. Personnel should wear respiratory and eye protection devices.
- D. Butyl Weather Barrier Sealant:
  - 1. Apply non-skinning butyl sealant as shown on shop drawings and manufacturer's installation instructions as necessary to establish the vapor barrier for the panels.
  - 2. Use non-skinning butyl tube sealant only for tight metal-to-metal contact.
  - 3. Do not use non-skinning butyl tube sealant to bridge gaps.
- E. Place panel fasteners through pre-punched holes in attachment clips, concealed within the joint of the panel. Secure units to the structural supports. Space clips as recommended by manufacturer or otherwise indicated on the approved shop drawings.
- F. SEALANT INSTALLATION FOR EXPOSED JOINTS
  - 1. Clean and prime surfaces to receive exterior exposed sealants in accordance with sealant manufacturer's recommendations.
  - 2. 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.
  - 3. Direct contact between butyl and silicone sealants shall not be permitted.
- G. TRIM INSTALLATION
  - 1. Place trim and trim fasteners only as indicated per details on the approved shop drawings.
  - 2. Field drill weep holes where appropriate in horizontal trim where indicated on shop drawings 1/4 inch diameter at 24 inches on center..
  - 3. Place a continuous strip of butyl tape or butyl sealant on closure trims for the length of the panel to be covered as indicated on shop drawings.

### 3.3 FIELD QUALITY CONTROL

- A. Testing Agency: General Contractor shall engage an independent testing and inspection agency acceptable to the architect to perform field tests and inspections and to prepare reports of findings.
- B. Field Water Test: After completing portion of metal wall panel assembly including accessories and trim, test a 2-bay area selected by the architect for water penetration in accordance with AAMA 501.2.

### 3.4 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

#### **DISCLAIMER:**

***Kingspan Insulated Panels Guide Specifications have been written as an aid to the professionally qualified Specifier and Design Professional. The use of this Guideline Specification requires the sole professional judgment and expertise of the qualified Specifier and Design Professional to adapt the information to the specific needs for the Building Owner and the Project, to coordinate with their Construction Document Process, and to meet all the applicable building codes, regulations and laws. KINGSPAN INSULATED PANELS EXPRESSLY DISCLAIMS ANY WARRANTY, EXPRESSED OR IMPLIED, INCLUDING THE WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE OF THIS PRODUCT FOR THE PROJECT.***