All Weather Insulated Panels

HR3 High Rib Roof Panel

**Instructions: Modify all bold text in specification. Delete as necessary.**

Questions concerning this specification should be directed to All Weather Insulated Panels Technical Services Department at 1-888-970-AWIP (2947).

1. GENERAL
   * + 1. Section INCLUDES
          1. Factory foamed-in-place insulated metal panels with through fastener metal roof panels and related trim and accessories.
       2. RELATed SECTIONS **[Modify as applicable for project]**
          1. Division 07 “Thermal Insulation” for insulation of roof and wall assemblies
          2. Division 07 “Roofing and Siding Panels” for insulated metal panels
          3. Division 07 “Metal Roof and Wall Panels” for factory-formed metal wall or roof panels
          4. Division 07 Section "Sheet Metal Flashing and Trim" for flashings and trim
       3. REFERENCES
          1. Design and Test Standards: Refer to the following organizational publications for design and test standards referenced within specification

American Society of Civil Engineers (ASCE)

International Building Code (IBC)

ASTM International (ASTM)

FM Global and FM Approvals (FM)

Underwriters Laboratories (UL)

Underwriters Laboratories of Canada (CAN/ULC)

* + - 1. DESIGN CRITERIA
         1. General: The insulated metal roof panels shall be metal faced foam core sandwich panels produced on a continuous process manufacturing line under strict quality control and must be independently audited by a recognized audit facility/testing lab. The roof panel system (panel thickness, gauge, spans, connections) shall be designed to resist specified wind loads with a deflection not to exceed L/240, thermally induced movement, and exposure to weather without failure.
      2. SUBMITTALS
         1. Product Data: Manufacturer’s data sheets for each product to be provided.
         2. Detail Drawings: Contractor shall furnish detailed drawings showing location and profile of insulated metal panels, as well as location and shape of formed metal flashings, the location and type of sealants and fasteners and design information.

Drawing of panel profile, thickness, gauge

Design information

Insulated Metal Panel Fastening schedule

Samples: Provide for each product specified.

* + - * 1. Maintenance Data: Refer to AWIP’s latest published documents on www.awipanels.com.
        2. Warranty: Provide manufacturer’s current Warranty specimen.

Submit manufacturer’s written two (2) year limited warranty providing materials to be free from defects in material and workmanship from the date of production excluding coil coatings and paint finishes that are covered under a separate warranty.

* + - 1. QUALITY ASSURANCE
         1. Installer Qualifications: Metal roof panels shall be erected by an experienced metal panel contractor in accordance with the approved drawings, specifications, and installation instructions.
         2. Manufacturer Qualifications: Qualified manufacturer that has tests and approvals for panel system identical to that used for this Project.

Approved manufactured listed in this Section with minimum ten years experience in manufacturing of insulated metal panels

Approved manufacturer certified to ISO 37301 (Compliance), ISO 9001 (Quality), ISO 14001 (Environmental), ISO 45001 (Occupational Health and Safety), IAS 473 (Cold Form Steel Components)

* + - * 1. Testing Agency Qualifications: An independent testing agency with the experience and capability to conduct the testing indicated, as documented according to IAS Accreditation or equal.

Retain test report and moisture survey subparagraphs below for all re-roof and re-cover applications.

* + - * 1. Source Limitations: Obtain all components, including insulated metal panels, fasteners, trim and other accessories from a single source manufacturer Warrantying the panel system.
        2. Substitutions: This specification is written with the HR3 panels as the basis of acceptable design, quality and performance. Requests for substitutions must be submitted in writing no less than 14 days prior to bid.
      1. DELIVERY, STORAGE, AND HANDLING
         1. Protect products of metal panel system during delivery, storage and handling to prevent staining, denting, deterioration of components or other damage. Product panels and trim bundles during shipping.

Deliver insulated metal roof panels in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storage.

Store in accordance with Manufacturer’s written instructions.

Cover insulated metal panels with temporary shelter and from direct sunlight until all components are installed.

* + - 1. Warranty

Manufacturer’s Warranty: Submit manufacturer’s written two (2) year limited warranty providing materials to be free from defects in material and workmanship from the date of production excluding coil coatings and paint finishes that are covered under a separate warranty.

Paint Finish Warranty: Submit Manufacturer’s limited warranty on the exterior paint finish for adhesion to the metal substrate and on the exterior paint finish for chalk, fade and cracking.

**Fluoropolymer (PVDF or FEVE) Two-Coat System:**

**Chalk in excess of a numerical rating of eight (8) when measured in accordance with the standard procedures outlined in ASTM D4214**

**Fade or change in color in excess of five (5) E units when calculated in accordance with ASTM D2244. The color change is to be measured on exposed painted surface cleaned of surface soils and oxidation.**

**Failure of adhesion, peeling, checking or cracking.**

**Warranty Period: Twenty (20) years from the date of installation of the panels.**

**OR**

**Silicone Modified Polyester (SMP) Two-Coat System:**

**Chalk in excess of a numerical rating of eight (8) when measured in accordance with the standard procedures outlined in ASTM D4214**

**Fade or change in color in excess of five (5) E units when calculated in accordance with ASTM D2244. The color change is to be measured on exposed painted surface cleaned of surface soils and oxidation.**

**Failure of adhesion, peeling, checking or cracking.**

**Warranty Period: Twenty (20) years from the date of installation of the panels.**

Installer’s Warranty: The installation contractor shall issue a separate warranty against defects in installed materials and workmanship, beginning from the date of substantial completion of the installation.

1. PRODUCTS
   * + 1. Manufacturer
          1. Basis of Design Manufacturer: All Weather Insulated Panels, 929 Aldridge Rd, Vacaville, CA 95688, Telephone: 888-970-AWIP, Email: sales@awipanels.com; Website: www.awipanels.com
       2. Performance requirements
          1. General: Provide metal panel system meeting performance requirements as determined by specification.
          2. Structural Performance: Provide metal panel assemblies capable of withstanding positive and negative loads and stresses as determined by ASTM E1592 Structural Test with the standard deflection criteria to be L/240.

Wind Loads: Determine wind loads based on applicable building code, wind speed, importance factor, risk category, exposure category and internal pressure coefficient.

Deflection Limits: Withstand inward and outward wind-load design pressures in accordance with applicable building code with maximum deflection of L/240 (exterior roof).

The panels shall be FM Approved as a Class 1 Roof Construction in accordance with FM 4471

* + - * 1. Thermal Performance: Provide insulated metal panel assemblies meeting the specified thermal performance

Foam thermal insulation value as determined by ASTM C518 steady state thermal transmission

a. Nominal R-value of 7.2 [hr·ft2·°F/Btu] per inch thickness at 75°F mean temperature and 8.2 [hr·ft2·°F/Btu] per inch at 35°F mean temperature

b. Nominal K-factor of 0.139 [Btu/hr·ft2·°F] per inch thickness at 75°F mean temperature and 0.122 [Btu/hr·ft2·°F] per inch at 35°F mean temperature

Panel system thermal performance value as determined by ASTM C1363 thermal transmittance evaluated with at least two panel joints

1. 2.5 inch thick: U-factor of 0.087 [Btu/hr·ft2·°F] at 75°F mean temperature and 0.078 [Btu/hr·ft2·°F] per inch at 35°F mean temperature
2. 3 inch thick: U-factor of 0.073 [Btu/hr·ft2·°F] at 75°F mean temperature and 0.064 [Btu/hr·ft2·°F] per inch at 35°F mean temperature
3. 4 inch thick: U-factor of 0.040 [Btu/hr·ft2·°F] at 75°F mean temperature and 0.032 [Btu/hr·ft2·°F] per inch at 35°F mean temperature
4. 5 inch thick: U-factor of 0.031 [Btu/hr·ft2·°F] at 75°F mean temperature and 0.026 [Btu/hr·ft2·°F] per inch at 35°F mean temperature
5. 6 inch thick: U-factor of 0.022 [Btu/hr·ft2·°F] at 75°F mean temperature and 0.020 [Btu/hr·ft2·°F] per inch at 35°F mean temperature
   * + - 1. Fire Performance Characteristics: Provide metal panel systems with the following fire-test characteristics determined by applicable test standard

Surface-Burning Characteristics: The foam core shall be tested per ASTM E84. The core shall have:

Flame Spread Index: 25 or less

Smoke Developed Index: 450 or less

Exterior Fire Exposure Test: The roof panels shall be tested as a Class A material per ASTM E108.

Room Test: The panel assembly shall have a FM Approvals Class 1 rating for wall and ceiling construction in accordance to the full scale FM 4880 test program with no height restriction.

IBC Chapter 26: Metal panel assemblies meeting the above test methods shall meet the requirements of the International Building Code on Foam Plastics.

Canadian Certifications **[as necessary]**

Fire Spread for Under Roof Deck Assemblies: The roof deck shall be tested in accordance to CAN/ULC S126.

Fire Growth of Insulated Building Panels in Full-Scale Room: The roof panel system shall be tested per CAN/ULC S138 and meet the standard criteria.

* + - * 1. Air Infiltration: Provide metal panel assemblies tested per ASTM E1680

Air leakage shall not exceed .036 cfm/ft2 at a static air pressure differential of 20 PSF.

* + - * 1. Water Penetration: Provide metal panel assemblies tested per ASTM E1646

Water penetration shall not be observed at the panel joint at a static pressure differential of 12 PSF.

* + - * 1. Florida Building Code Requirements: The roof panel system shall have **[Florida Product Approval]** as required by local jurisdiction. **[Delete section if project is not within the State of Florida.]**
      1. Insulated metal ROOF panels

The insulated metal roof panel shall have a side joint with a 1 7/16 inch standing rib overlap design utilizing a continuous ribbon of 3/16 inch x 1 inch butyl tape sealant applied to the adjacent panel rib to be covered by the overlapping metal edge and fastened together with stitch fasteners. The panels shall be fastened with ¼-14 hex head sealing washered fasteners installed through pre-punched EPDM-sealed 16 gauge saddle washers. The fasteners shall positively lock the face and liner sheet of the panel to the structural supports and provide positive resistance to negative wind loads. An additional minimum 1/4 inch continuous bead of approved non-skinning butyl gun grade sealant shall be applied at the liner side edge of the roof panel joint prior to engagement as shown on the panel shop/erection drawings

Basis of Design: All Weather Insulated Panels, HR3

Provide insulated metal panel with minimum R Value per ASTM C518: [**insert R Value] [minimum required by applicable code].**

Provide insulated metal panel with maximum U Factor per ASTM C1363: **[insert U Factor] [maximum required by applicable code]**

Provide insulated metal panel with minimum thickness: **[1.5’’, 2.5’’, 3”, 4’’, 5’’, 6’’]**

The insulated metal panel shall be 40’’ wide with an overlapping rib.

Provide exterior metal substrate. G90 galvanized coated steel conforming to ASTM A653 or AZ50 aluminum-zinc (Galvalume) alloy coated steel, conforming to ASTM A792, minimum grade 33, prepainted by the coil-coating process per ASTM A755

The exterior profile shall be non-embossed with three standing ribs and lightly planked mesa ribs, HR3

Facing Thickness: **[26 ga, 24 ga, 22 ga]**

Finish: **[Fluoropolymer (PVDF or FEVE) Two-Coat System] [Silicone Modified Polyester (SMP) Two-Coat System]**

Thickness: 1.0 mil dry film thickness

Color: **[As Indicated] [As Selected by Architect from manufacturer’s standard colors] [Match Architect’s custom color]**

Provide interior metal substrate. G90 galvanized coated steel conforming to ASTM A653 or AZ50 aluminum-zinc (Galvalume) alloy coated steel, conforming to ASTM A792, minimum grade 33, prepainted by the coil-coating process per ASTM A755

The interior profile shall be standard embossed with lightly planked mesa ribs on 2.22’’ centers

Facing Thickness: **[26 ga, 24 ga, 22 ga]**

Finish: **[Polyester Two-Coat System] [Silicone Modified Polyester (SMP) Two-Coat System] [Fluoropolymer (PVDF or FEVE) Two-Coat System] [Vinyl Plastisol (PVC) Two-Coat System] [304-2B Stainless Steel]**

Thickness: 1.0 mil dry film thickness

Color: [**Imperial White] [As Indicated] [As Selected by Architect from manufacturer’s standard colors] [Match Architect’s custom color]**

The polyisocyanurate foam core shall meet or exceed the following physical properties:

Compressive Strength (ASTM D1621): 20 PSI

Density, in-place (ASTM D1622): 2.00 – 2.50 PCF

Shear Strength (ASTM C273): 16.75 PSI

Tensile Adhesion (ASTM D1623): 13.5 PSI

Tensile Strength (ASTM C297): 26 PSI

Closed Cell Content (ASTM D6226): 93.75%

Dimensional Stability (ASTM D2126): 14 day aged < 1% change at -20 degree F, < 1.5% change at 158 degree F dry heat, < 4.5% change at 158 degree F humid heat

Panels not meeting these testing and performance criteria are not permitted to be used for this metal roof panel application.

* + - 1. Metal ROOF panel accessories
         1. Flashings: The insulated metal panel manufacturer shall furnish either the formed metal flashings or the flat stock in the same gauge, color, and paint finish system as the panel facings
         2. Saddle Washers: The color-matched saddle washer with EPDM gasket shall be used at each standing rib identical to washers used in testing.
         3. Panel Fasteners: Self-drilling or self-tapping screws and other acceptable fasteners recommended by panel manufacturer. Where exposed fasteners cannot be avoided, supply corrosion-resistant fasteners with heads matching color of metal panels by factor-applied coating, with weather tight sealing washers.
         4. Sealant: Provide non-skinning butyl sealant and/or butyl tape sealant in accordance to manufacturer’s standards

1. EXECUTION
   * + 1. EXAMINATION
          1. Examine metal panel system substrate with Installer. Inspect for erection tolerances and other conditions that would adversely affect installation of metal panels.

The contractor or installer shall examine the alignment of the steel supports before installing the metal roof panel system. The steel shall be aligned to the tolerances established in the AISC code of standard practice, Section 8 and the supplemental modification control Section 7.11.

Panel support tolerances:

Maximum deviation of steel alignment shall be limited to -0 to 3/16’’ from the control with a 1/8’’ maximum change in deviation for any member of any 10’-0’’ run of panel.

The erector shall not proceed with installation if steel support is not within the specified tolerances

The face of all structural members to which the panels are attached must be in the same vertical plane, flat and free of obstructions, such as weld marks, bolts or rivet heads. In no case shall roof panels be fastened directly to structural framing members installed in the same direction of the roof panels.

* + - 1. Metal Panel Installation
         1. Manufacturer shall provide panel contractor with written instructions for recommended product storage and handling as well as standard installation procedures.
      2. FIELD QUALITY CONTROL

Retain if required.

* + - * 1. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform tests and inspections and to prepare test reports.

A roof inspection is required by All Weather Insulated Panels before issuance of Warranty.

* + - 1. PROTECTION AND CLEANING
         1. Remove temporary protective films in accordance with manufacturer’s written instructions. Do not leave in direct sunlight.
         2. Clean finished surfaces as recommended by metal panel manufacturer.
         3. Repair or replace any damaged or defective panels after determination of responsibility.

END OF SECTION

Qr code

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