
Umicore Building Products USA, Inc.
3600 Glenwood Ave., Suite 250
Raleigh, North Carolina 27612
Phone (919) 874-7173
Fax (919) 874-7140
Website www.vmzinc-us.com
E-mail info@vmzinc-us.com

January 2009

Product Guide Specification

Specifier Notes: This product guide specification is written according to the Construction Specifications Institute (CSI) 3-Part Format, including *MasterFormat*, *SectionFormat*, and *PageFormat*, as described in *The Project Resource Manual—CSI Manual of Practice, Fifth Edition*.

The section must be carefully reviewed and edited by the Architect to meet the requirements of the project and local building code. Coordinate this section with other specification sections and the Drawings. Delete all “Specifier Notes” after editing this section.

Section numbers and titles are from *MasterFormat 1995 Edition*, with numbers and titles from *MasterFormat 2004 Edition* in parentheses. Delete version not required.

SECTION 07315 (07 31 30)

METAL PANELS (ROOF)

Specifier Notes: This section covers Umicore Building Products USA, Inc. “VM ZINC® ADEKA” factory-formed, zinc-alloy, metal roof panels.

Panel substrate and framing designs can vary greatly. The Architect should consult model building code, Umicore Building Products USA’s product user guide and architectural manual, or building envelope consultant for additional information of appropriate roof designs. Sheathing, insulation, weather resistive barrier, and vapor retarder installation may be specified in this section or in other sections.

Consult Umicore Building Products USA, Inc. for assistance in editing this section for the specific application.

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Factory-formed, zinc-alloy, Adeka metal roof panel.

1.2 RELATED SECTIONS

Specifier Notes: Edit the following list of related sections as required for the project. List other sections with work directly related to this section.

- A. Section 05400 (05 40 00) – Cold-Formed Metal Framing: Secondary support framing
- B. Section 06100 (06 10 00) – Rough Carpentry: Framing and Sheathing
- C. Section 07210 (07 21 00) – Building Insulation (Thermal Insulation): Roof insulation.
- D. Section 07260 (07 26 00) – Vapor Retarders.
- E. Section 07270 (07 27 00) – Air Barriers.
- F. Section 07620 (07 62 00) – Sheet Metal Flashing and Trim: Fascia, copings, flashings, and other sheet metal work.
- G. Section 07920 (07 92 00) – Joint Sealants.

1.3 REFERENCES

Specifier Notes: List standards referenced in this section, complete with designations and titles. This article does not require compliance with standards, but is merely a listing of those used.

- A. ASTM B 32 – Standard Specification for Solder Metal.
- B. ASTM C 578 - Specification for Preformed, Cellular Polystyrene Thermal Insulation
- C. ASTM D 968 – Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive.
- D. ASTM D 1970 – Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection.
- E. ASTM E 96 – Standard Test Methods for Water Vapor Transmission of Materials.

1.4 SYSTEM DESCRIPTION

- A. Provide complete Adeka metal panel system as indicated, including:
 - 1. Factory-formed, zinc-alloy, metal panels.
 - 2. Attachment components.
 - 3. Weather-resistive barrier materials.
- B. Thermal Movements:
 - 1. Provide metal panel roof system that allows for thermal movements.
 - 2. Provide fasteners and components that resist rotation and avoid shear stress as a result of system thermal movements.

1.5 SUBMITTALS

-
- A. Comply with Section 01330 (01 33 00) – Submittal Procedures.
 - B. Product Data: Submit panel manufacturer’s product data, including details of construction relative to materials, dimensions of individual components and profiles, finishes, and panel manufacturer’s written and published installation instructions and installation guides.
 - C. Shop Drawings: Submit installer’s shop drawings as verified by panel manufacturer, including roof plans, elevations, sections, and details, indicating installation layout of metal roof panels with keyed references to termination points. Include the following:
 - 1. Details of metal panels, including seams and dimensions.
 - 2. Details for joining and securing metal panel roof system, including layout of fasteners, and other attachments. Include pattern seams.
 - 3. Details of penetrations.
 - 4. Details of special conditions.
 - 5. Details of connections to adjoining work.
 - 6. Details of required accessory items.
 - 7. Metal panel roof assembly and attachments.
 - 8. Details where roof mounted items such as roof hatches, pipe & equipment supports, penetrations, fixtures, snow guards and roof curb mounted items.
 - 9. Details of terminations, such as edge conditions, eaves, ridges, valleys, rakes, crickets, & roof to roof conditions.
 - D. Samples for Verification: Submit manufacturer’s samples for each type of exposed component required, including:
 - 1. Metal Roof Panel: Standard size is 15 ½” x 15 ½” (394 mm x 394mm). Include fasteners.
 - 2. Trim and Closures: 24” long (600mm) sample of each type of trim and closure, including fasteners and components.
 - E. Qualification Data: Submit qualification data for manufacturer and installer to demonstrate capabilities and experience.
 - F. Warranties: Submit warranties from:
 - 1. Manufacturer.
 - 2. Installer.

1.6 QUALITY ASSURANCE

- A. Panel Manufacturer’s Qualifications: Manufactured a minimum of 250,000 square feet of metal roof panels of similar type to that specified.
- B. Installer’s Qualifications:
 - 1. Engage an experienced installer who has completed metal roof panel installation similar in material, design, forming method, and extent to that indicated for this Project and with a record of successful in-service performance.
 - 2. Provide evidence of installer’s participation in panel manufacturer’s training course.
- C. Metal Roof Panel Standard: Comply with manufacturer’s written and published instructions.

Specifier Notes: Edit the following paragraph as required for the project.

- D. Mock-ups:

-
1. Before installing metal roof panels, construct mock-ups. Verify selection made under sample submittals and demonstrate aesthetic effects and qualities of materials and execution as required by Architect.
 2. Build mock-ups to comply with the following requirements:
 - a. Construct mock-ups in location and of size (minimum 6'x4') as directed by Architect.
 - b. Receive approval of mock-ups by Architect in writing.
 - c. Approval of mock-ups does not constitute approval of deviations from the Contract Documents contained in mock-ups, unless such deviations are specifically approved by Architect in writing.
 - d. Approved mock-ups may become part of the completed Work, if undisturbed at time of Substantial Completion and approved by Architect in writing.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Delivery:

1. Inspect delivered materials within 5 days from date of delivery. Report damaged materials to panel manufacturer within 5 days.
2. Deliver materials to site in panel manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and panel manufacturer.
3. Deliver materials so as not to be damaged or deformed.
4. Package metal panels for protection during transportation and handling.
5. Leave strippable protective UV-resistant film on metal panels.

B. Storage and Handling:

1. Store materials in clean areas in accordance with manufacturer's written and published instructions and installation guides.
2. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.

1.8 PROJECT CONDITIONS

- ### **A. Weather Limitations:** Install metal roof panels only when weather conditions permit installation in accordance with manufacturer's written and published instructions and installation guides.

1.9 WARRANTY

A. Warranty Period:

1. Materials: 5 years from date of Substantial Completion. (Provided by the Panel Manufacturer)
2. Installation: 2 years from date of Substantial Completion. (Provided by the Installer.)

PART 2 PRODUCTS

2.1 MANUFACTURER

- ### **A. Metal Panel System Manufacturer:** Umicore Building Products USA, Inc., 3120 Highwoods Blvd., Suite 104, Raleigh, North Carolina 27604. Phone (919) 874-7173. Fax (919) 874-7140. Website www.vmzinc-us.com. E-mail info@vmzinc-us.com.

2.2 MATERIALS

-
- A. Metal: "VM ZINC Adeka" factory-formed, zinc-alloy, metal roof panel.
1. Zinc Alloy: 99.995 percent electrolytic high-grade zinc with alloy additives of copper (0.08 percent to 0.20 percent), titanium (0.07 percent to 0.12 percent), and aluminum (0.015 percent).
 2. Thickness: (0.65 mm) (0.025 inch)
 3. Surface Aspect:

Specifier Notes: Specify required surface aspect of metal roof panels.

- a. Preweathered Zinc: "QUARTZ ZINC". Dark gray zinc with luminance Y between 21 and 26 on exposed side or architect approved equal color management system.
 - b. Preweathered Zinc: "ANTHRA ZINC". Charcoal black zinc with luminance Y between 4 and 8 on exposed sides or architect approved equal color management system.
 - c. Pigmented Preweathered Zinc: "PIGMENTO BLUE". Zinc with a blue pigmented coating.
 - d. Pigmented Preweathered Zinc: "PIGMENTO RED". Zinc with a red pigmented coating.
 - e. Pigmented Preweathered Zinc: "PIGMENTO GREEN" Zinc with a green pigmented coating.
4. Dimensional Tolerances:
- a. Coverage: Plus or minus 1/8 inch.
 - b. Flatness at Maximum Deflection: 1/4 inch on 36 inches.
 - c. Curvature: No tolerance.
5. Polystyrene backer board: Meeting ASTM C578, Class A, Type IX , with nominal 2.0 lb density, and sized to conform to back of panel.
- B. Metal Panels:
1. Formed lozenge shaped (45 degree shingled pattern) concealed fastener roof panel, formed with self aligning panel edge and a raised flat pan, with integral polystyrene backer board.
 2. Panels are 15 3/4" x 15 3/4" (394mm x 394mm) lozenge shaped featuring a locking key at the base of the panel, top and side screw holes, raised edge, and integral alignment guide.
 2. Panels are installed from bottom of slope to top, with concealed fasteners.

Specifier Notes: Verify product compatibility if products other than those listed in this article are to be specified and installed in conjunction with the metal roof panels.

2.3 WEATHER-RESISTIVE BARRIER MATERIALS

- A. Available Products: Subject to compliance with requirements, weather-resistive barrier materials that may be incorporated into the Work include, but are not limited to, the materials specified.
- B. Hydrophobic Weather-Resistive Barrier:

Specifier Notes: Specify fabric underlayment as described below or another type of hydrophobic weather-resistive barrier of equal performance.

1. Fabric Underlayment:
 - a. Type: High-permeability, spun-bonded, non-woven, polypropylene fabric.
 - b. Weight: 6.103 oz/sq. yd (175grams/sq.m)
 - c. Thickness: 0.023 inch (0.60 mm)
 - d. Water Vapor Transmission, ASTM E 96, Method A: 212 perms.
 2. Acceptable Products:
 - a. VM Zinc Plus Underlay by Umicore Building Products.
 - b. Fabric underlayment approved by the panel manufacturer.
- C. Flashing Membrane: Self-adhering, high-temperature sheet:
1. Slip-resisting, polyethylene-film top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release-paper backing; cold applied.
 2. Minimum Thickness: 30 to 40 mils (0.76 to 1.0 mm).
 3. Provide primer when recommended by flashing membrane manufacturer.
 4. Thermal Stability, ASTM D 1970, 240 degrees F (116 degrees C): Stable.
 5. Low Temperature Flexibility, ASTM D 1970, Minus 20 degrees F (29 degrees C): Passes.
 6. Available Products:
 - a. Carlisle Coatings & Waterproofing, Div. of Carlisle Companies Inc.; CCW WIP 403HR High Performance Underlayment.
 - b. Grace, W. R. & Co.; "Vycor Ultra HT".

Specifier Notes: Self adhering flashing membrane below to be used for ice and water membranes, valley flashings, and low slope flashings. Slip sheet of fabric underlayment is still required. Consult panel manufacturer.

2.4 THERMAL INSULATION

- A. Insulation: As specified in Section 07210 (07 21 00).

2.5 FASTENERS FOR METAL ROOF PANELS

- A. Fasteners:
1. #8 by 1-1/2-inch, 300 series stainless steel, bugle head, self-drilling screw, type "A".
 2. Resist negative design load requirements.
- B. Exposed Fasteners:
1. Self tapping screws, bolts, self locking rivets and other suitable fasteners designed to withstand design loads.
 2. Material: 300 series stainless steel.
 3. Heads: Factory applied coating to match color of metal.

Specifier Notes: Coordinate the following sentence with the Submittals article of this section.

2.6 ACCESSORIES

-
- A. Flashing and Trim:
1. Shop or Field-fabricated from zinc-alloy sheets.

Specifier Notes: Specify flashing and trim thickness. Consult manufacturer for more information. Specify thicker products where trim with level surface may be required for aesthetic reasons.

2. Minimum Thickness: 0.031 inch (0.80mm).
3. Seal against weather.
4. Provide finished appearance.
5. Provide pull-out resistance and flatness.
6. Match surface aspect of adjacent metal roof panels.
7. Flashing Backside Coating:
 - a. Coating Thickness: 60 microns.
 - b. Abrasion Resistance, ASTM D 968, Method D: 140 liters.
8. Backer plates: Provide metal backing plates at panel edges, terminations, openings, splices, and where recommended by manufacturer, consisting of Zinc Plus or stainless steel sheet goods formed in configuration and thickness recommended by manufacturer.
9. Cleats: Continuous G90 galvanized cleats, formed in configuration, and thickness as recommended by the manufacturer, minimum 0.0239" (0.60mm)
10. Ventilation screen: 51% open perforated zinc, 0.039" (1.00mm) thickness, by metal panel manufacturer where required.

B. Exposed Fasteners:

1. Self tapping screws, bolts, self locking rivets and other suitable fasteners designed to withstand design loads.
2. Material: 300 series stainless steel.
3. Heads: Factory applied coating to match color of metal.

C. Solder and Stripping for Accessories:

1. Solder for Zinc-Alloy: ASTM B 32, 60 percent lead and 40 percent tin with low antimony, as recommended by panel manufacturer.
2. Stripping:
 - a. "Stay-Clean" soldering flux for removal of zinc-alloy preweathering layer.
 - b. Abrasive disc for removal of backside coating.

Specifier Notes: Provide barrier board where Class "A" roof is required. Consult panel and barrier board manufacturer for more information.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with installer present, for compliance with requirements for installation tolerances, supports, and other conditions affecting performance of work.

-
1. Verify that substrate is plumb, sound, dry, smooth, clean, sloped for drainage, and completely anchored, and that provision has been made for piping, flashings, and penetrations through roof panel system.
 2. Examine primary and secondary roof framing to verify that purlins, angles, channels, and other structural support members, sheathing, roof deck and anchorages have been installed correctly.
 3. Prepare written report, endorsed by installer, listing conditions detrimental to performance of Work of this section. Submit copy of report to Architect.

B. Examine roughing-in for components and systems penetrating roof to verify actual locations of penetrations relative to seam locations of metal panels before installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

Specifier Notes: Consult manufacturer's written and published instructions and installation guides for assistance in editing this article as required for the project.

A. Install metal roof panels in accordance with manufacturer's written and published instructions and installation guides.

B. Install panels in orientation, sizes, and locations indicated on the Drawings.

C. Install panels plumb, level, square, true to line, and within installation tolerances.

D. Underlayment Installation:

1. Install and fasten fabric underlayment per manufacturer's recommendations.
2. Lay in panel fashion to shed water, lapping joints, edges, minimum of 6" (150 mm) .
Cover underlayment within 60 days.

E. Self-Adhering Sheet Underlayment:

1. Install and fasten fabric underlayment per manufacturer's recommendations.
2. Lay in panel fashion to shed water, lapping joints, edges, per manufacturer's recommendations.
3. Apply primer to deck surfaces, per manufacturer recommendations.
4. Overlap sides and edges, and stagger per manufacturer's recommendations.
5. Roll laps and field of underlayment to provide an wrinkle free installation.

F. General:

1. Mark out lines on the substrate sheathing, every 28 cm at right angles to the baseline. These lines will be used to line the panel elements up with the self contained alignment guide on each panel.
2. Lay the panels starting at the eave, folding the locking key tab under eave flashing.
3. Attach the metal panels with specified screws through the predrilled holes. Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.
4. Cut the panels with cutting shears to accommodate terminations, and placement around penetrations, and discontinuities. Do not field-cut metal roof panels by torch. At field modified panels, drill additional holes for fastening to substrate. Fasteners at field drilled holes shall be provided with neoprene gasketed washers, with concealed clips also acceptable for securing the cut panel.

-
5. Fasten metal panels in accordance with manufacturer's written and published instructions and installation guides.
 6. Flash and seal the metal panels with weather closure at termination, edges and at perimeter of openings.
 7. Install flashing and trim as metal panel installation proceeds.
 8. Fasten flashings and trim around openings and similar elements.
 9. Do not allow construction debris to contaminate metal roof panels.
- G. Fasteners: Use fasteners of type and size that will secure roof components in compliance with design load requirements.
- H. Provide concealed fasteners and expansion provisions, where possible, in exposed work and locate to minimize possibility of leakage.
- I. Metal Protection: Do not install panels with non-compatible materials.

Specifier Notes: Verify that product and assemblies are listed in the UL's Current "Roofing and Materials and Systems Directory."

3.3 UL RATED ROOF ASSEMBLIES:

- A. Install roof panels, complete with barrier board, underlayment, fasteners and accessories as required to achieve the UL rated assembly. Include performance requirements as required for wind-uplift. Delete if UL-class roof is not required. Verify that product is listed in US Directory.
- B. Wind-Uplift Rating: [UL 1897] [UL 580, Class 90].
- C. Wind-Uplift Resistance:
1. Provide metal roof panel system capable of resisting design pressures as specified and as indicated on the Drawings.
 2. Provide clips, fasteners, and clip spacing of type as specified and as indicated on the Drawings capable of sustaining design loads without failure.
- D. Thermal Movements:
1. Provide metal roof panel system that allows for thermal expansion and contraction using concealed clips and fasteners as necessary to prevent roof panel deflection and warping.
 2. Provide clips that resist rotation and avoid shear stress as a result of metal roof panel system thermal movements.
 3. Base engineering calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

3.4 TOLERANCES

- A. Installation Tolerances:
1. Maximum Alignment per Panel Variation: + or - 1/16 inch (+ or - 1mm)

3.5 CLEANING

- A. Clean exposed metal surfaces in accordance with manufacturer's written and published instructions and installation guides.

-
- B. Clean and neutralize flux materials. Remove excess solder.
 - C. Clean finished surfaces on completion of metal roof installation, including removing unused fasteners, metal filings, rivet stems, and pieces of flashing.
 - D. Maintain metal roof panels in clean condition during construction.
 - E. Remove protective film within 60 days of installation.

3.5 PROTECTION

- A. Protect installed metal roof panel system to ensure that, except for normal weathering, panel system will be without damage or deterioration at time of Substantial Completion.

END OF SECTION