

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*.

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 when editing this section.

Section numbers and titles are from *MasterFormat* 2015 Edition, with numbers and titles from *MasterFormat* 1995 Edition in brackets. Delete version not required.

Brackets indicate options in text to be filled in or deleted by the author; they should NOT be visible in final document.

SECTION 07 32 19 [07320]

ZALMAG® STEEL ROOF TILES

Specifier Notes: This section covers Millennium Forms, LLC ZALMAG® STEEL roof/wall tiles. Consult Millennium Forms for assistance in editing this section for the specific application.

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Galvanized ZALMAG® STEEL tiles and flashing.
- B. Underlayments.
- C. Roof ventilation.

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 06 10 00 [06100] – Rough Carpentry: Roof decking.
- B. Section 07 62 00 [07620] – Sheet Metal Flashing and Trim.
- C. Section 07 92 00 [07920] – 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, rather is merely a listing of those used.

- A. ASTM A1046/A1046M - Standard Specification for Steel Sheet, Zinc-Aluminum-Magnesium Alloy-Coated by the Hot-Dip Process; 2014.
- B. ASTM D226/ D226M – Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing; 2009.
- C. ASTM D1970/D1970M – Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials used as Steep Roofing Underlayment for Ice Dam Protection; 2001.
- D. ASTM D4479/D4479M – Standard Specifications for Asphalt Roof Coatings – Asbestos-Free; 2000.
- E. ASTM D4689/D4689M - Standard Specification for Asphalt-Saturated Organic Felt Underlayment Used in Steep Slope Roofing; 2015.
- F. ASTM E8/E8M - Standard Test Methods for Tension Testing of Metallic Materials; 2013.
- G. ASTM E18/E18M - Standard Test Methods for Rockwell Hardness of Metallic Materials; 2014.

1.4 SUBMITTALS

- A. See Section 01 33 00 [01330] – Submittal Procedures for additional information.
- B. Product Data: Submit manufacturer's product data describing product characteristics including sizes, connection methods, finishes, and accessories.
- C. Initial Samples: Submit one (1) or more samples of each finish of ZALMAG® steel roof tiles to show the natural variation and color range possible.
Submittal Samples: Submit three (3) samples of each finish of ZALMAG® steel roof tiles from material sourced specifically for project, to show the natural variation and color range expected for this specific project.
- D. Manufacturer's Certification: Submit manufacturer's certification that materials comply with specified requirements and are suitable for intended application.

- E. Installation Instructions: Manufacturer's instructions including surface preparation and installation procedures.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
- B. Storage: Store materials in clean, dry area in accordance with manufacturer's instructions.
- C. Handling: Protect materials during handling and installation to prevent damage.

1.6 WARRANTY

- A. See Section 01 78 00 [01780] – Closeout Submittals for additional information.

Specifier Notes: Select appropriate warranty with regard to finish type.

- B. Submit manufacturer's standard limited liability warranty stating that roofing tiles will be free from manufacturing defects which adversely affect tile's performance;

PART 2 PRODUCTS

2.1 MANUFACTURER

- A. Millennium Forms, LLC, 550 East Centralia Street, Elkhorn, WI 53121 Phone 262.723.7778
Website www.millenniumforms.com E-mail info@millenniumforms.com
- B. Substitutions: Not allowed [See Section 01 60 00 [01600] – Product Requirements].

2.2 MATERIALS

- A. ZALMAG® STEEL Millennium Forms Tile:
 - 1. Description: Individual roof tiles with four-sided interlocking design, self-aligning tab, and concealed nailing strip with two (2) holes. Progressive Die Stamped System.
 - 2. Material: ZALMAG® STEEL.
 - a. Base Material: ASTM A1046/A1046M, with corrosion-resistant coating,
 - b. Coating consists of Zinc, Aluminum, Magnesium, and Silicon.

Specifier Notes: Specify Size & Weight to be used on Project.

- 3. Size:
 - a. Flat Tile: 15 inches by 9-5/8 inches; Exposure: 14-1/2 inches by 8-5/16 inches +/- 1/16 inch.
 - b. Cupped Tile: 15 inches by 9-5/8 inches; Exposure: 14-1/2 inches by 8-5/16 inches +/- 1/16 inch.
 - c. TS Tile: 7-3/4 inches by 17-1/4 inches; Exposure: 7-1/4 inches by 16-1/4 inches +/- 1/16 inch.

- d. Diamond Tile: 8-5/8 inches by 9-3/4 inches; Exposure: 8 inches by 8-3/8 inches +/-1/16 inch
- 4. Weight: (mill tolerances apply)
 - a. Qty 1 Flat Tile: 0.842 lbs/part
 - b. Qty 1 Cupped Tile: 0.842 lbs/part
 - c. Qty 1 TS Tile: 0.784 lbs/part
 - d. Qty 1 Diamond Tile: 0.416 lbs/part
- 5. Thickness: 0.018-inch (26-gauge) mill tolerances apply.
- 6. Density: 0.284 lbs/cubic inch
- 7. Temper: Hot Rolled
- 8. Tensile Strength: ASTM E8/E8M, 50,000 psi.
- 9. Yield Strength: ASTM E8/E8M, 27,600 psi.
- 10. Elongation: ASTM E8/E8M, 22 percent
- 11. Rockwell Hardness: ASTM E18/E18M, B 58
- 12. Thermal Conductivity: 360 BTU-in/hr-ft²-°F
- 13. Performance Ratings:
 - a. Wind: 110 mph.

Specifier Notes: For Millennium Forms, specify tile style(s) to be used on Project.

- 14. Millennium Forms Tile Profiles
 - a. Flat Tile
 - b. Cupped Tile
 - c. TS Tile
 - d. Diamond Tile

Specifier Notes: Select applicable finish(es). ZALMAG® is offered in three (3) finishes: Natural, Pre-Patina II. and Black. Zalmag is a natural material that will show a slight variation in both finish and color and continue to change during Zalmag's natural weathering process.

- 15. Finish:
 - a. Natural
 - b. Pre-Patina II (color range)
 - c. Black (color range)

2.3 ACCESSORIES

- A. Trim and Flashing: Same material, gauge, and finish as ZALMAG® tiles except where otherwise noted; See Section 07 62 00 [07620] - Sheet Metal Trim and Flashing for fabrication requirements.

Specifier Notes: Edit the follow list as required for project

- 1. Starter Gable: 2 x 2 x 120 inches; 24-gauge
- 2. Valley: 6-5/8 x 6-5/8 x 120 inches; 24-gauge.
- 3. End Wall Trim: 3-1/4 x 3-1/4 x 120 inches; 24-gauge
- 4. Side Wall Trim: 3-1/4 x 3-1/4 x 120 inches; 24-gauge
- 5. Gable End Trim: 2 x 2 x 120 inches; 24-gauge

6. Continuous Ridge: 4-1/2 by 4-1/2 by 120 inches; 24-gauge; consists of two (2) cleats and one (1) ridge cap.

Specifier Notes: Edit gutter and downspout requirements for project, or use paragraph below. Specify gutter and downspout shape, size and attachment method, or refer to Section 07 62 00

7. Gutters and Downspouts: See Section 07 62 00 [07620] - Sheet Metal Flashing and Trim

***** OR *****

8. Size gutters and downspouts for rainfall intensity determined by a storm occurrence of 1 in 10 years in accordance with SMACNA Architectural Sheet Metal Manual.
11. Gutters: [_____].
10. Downspouts: [_____].

Specifier Notes: Check with the local building code for roof venting requirements. Roof vent is available from Millennium Forms.

- B. Roof Ridge Vent:
 1. Ridge Vent: Rigid and spun-bond plastic [7] [9] [11-1/4] inches wide.
 2. Height: 5/8 [1]-inch
 3. 20-foot Roll [4-foot Sections]
 4. Net Free Air: 12.7 [19] inches per lineal foot
 5. Product: Quarrix Ridge Vent: www.quarrx.com/ventilation-products/ridge-vent/
 6. Substitutions: Not Allowed [As provided under Section 01 60 00 [01600] – Product Requirements].

Specifier Notes: Choose the appropriate underlayment(s) for the project, delete the non-selected products

- C. Underlayment: Asphalt saturated organic felt, unperforated complying with ASTM D 226/D 266M, Type II (No. 30).
 1. Provide [_____] manufactured by [_____], or approved equal. Shall be rated for high-temperature resistance.
- D. Underlayment: Synthetic non-asphaltic sheet, non-self-adhesive sheet, complying with requirements of ASTM D 226 and D 4869
 1. Type: Reinforced polypropylene and/or polyolefin composite sheet
 2. Provide [_____] manufactured by [_____], or approved equal. Shall be rated for high-temperature resistance.
- E. Eave Protection Membrane: Self-adhered membrane roofing underlayment complying with ASTM D 1970; minimum thickness: 40 mils; with strippable release paper and slip-resistant embossed polyethylene to surface.
 1. Provide [_____] manufactured by [_____], or approved equal. Shall be rated for high-temperature resistance.
- F. Fasteners:

1. Shingle Fasteners: Galvanized steel, ring-shank roofing nails.
 - a. Minimum Length: 3d (1-1/4 inches).
 2. Underlayment Fasteners: Galvanized steel, ring-shank roofing nails, or staples with washers.
- G. Joint Sealants: Exterior-grade, high-temperature, silicone joint sealant. As specified in Section 07 92 00 [07920] – Joint Sealants.
- H. Bituminous Paint: Asphaltic mastic, ASTM D4479/D4479M, Type I.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine areas to receive ZALMAG® steel roof tiles for solidness and structural stability of deck.
- B. Notify Architect of conditions that would adversely affect installation.
- C. Do not begin surface preparation or installation until unacceptable conditions are corrected.
- D. Ensure minimum roof slope of 3:12.
- E. Ensure roof deck is solid with a minimum thickness of:
 1. Plywood: 1/2 inch.
 2. Oriented Strand Board (OSB): 19/32 inch.
- F. Inspect attic to determine if existing roof deck needs to be replaced.

3.2 SURFACE PREPARATION

- A. Prepare surfaces in accordance with manufacturer's instructions.
- B. Ensure surfaces to receive ZALMAG® steel roof tiles are smooth and even, and that there are no protruding nail heads.

3.3 INSTALLATION

- A. Eave Protection Membrane:
 1. Install eave protection membrane in accordance with manufacturer's instructions.
 2. Install eave protection membrane from eave edge to minimum 24 [] inches up-slope beyond interior face of exterior wall.
 3. Install eave protection membrane centered at valleys for entire length. Weather-lap joints 12 [] inches minimum.
- B. Install underlayment in accordance with manufacturer's instructions [and as designated on roof drawings]. Shall be rated for high-temperature resistance.
- C. Overlap underlayment or eave protection membrane 4 inches minimum over eave and edge trim.
- D. Install ZALMAG® steel roof tiles in accordance with manufacturer's instructions.

Specifier Notes: Select appropriate installation process to prevent “color clumping” and ensure random color range distribution throughout project. The Random Sort option has a premium and is not the default method.

- E. Install by:
 - 1. pulling tiles from four to five boxes (or more) during installation to assure random variation of finish.
 - 2. following the approved Random Sort instructions from Millennium Forms.
- G. Use specified fasteners at spacing in accordance with manufacturer’s instructions.

Specifier Note: Most common source of galvanic corrosion is mixing Zalmag with any other dissimilar metal besides carbon steel.

- H. Prevent Electrolysis:
 - 1. Prevent dissimilar metals and corrosive nonmetallic materials from coming into direct contact with ZALMAG® steel materials.
 - 2. Do not allow water to flow from dissimilar metals to ZALMAG® steel materials.
- I. Install trim and flashing in accordance with manufacturer’s instructions.
- J. Joint Sealants:
 - 1. Install joint sealants as specified in Section 07920 [07 92 00].
 - 2. Install joint sealants at overlapping flashing and exposed fastener heads.

3.4 PROTECTION

- A. Protect installed ZALMAG® steel roof tiles to ensure that, except for normal weathering, tiles will be without damage or deterioration at time of substantial completion.
- B. Minimize traffic over finished roof surface. Where walking on roof is absolutely necessary, wear soft-soled shoes and walk on butt of shingles to avoid denting, deformation, and other damage.

END OF SECTION