

This document specifies Metal Roofing Systems prefinished factory formed metal roofing marketed as MRS System 2000® steel and aluminum roofing systems and includes MRS flashing and Trim. MRS finish is a fluoropolymer (70% Kynar 500® or 70% Hylar 5000®) resin coating applied to aluminum or galvanized steel. (Kynar 500 is a registered trademark of Elf Atochem North American, Inc.; Hylar 5000 is a registered trademark of Ausimont USA.) This specification does not include other Metal Roofing Systems products, such as: coping systems and gravel stops.

**SECTION 07410
METAL ROOF & WALL PANELS**

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes: Factory-formed metal roofing or soffits, including flashing and accessories.
Metal roofing includes:

MRS System 2000

Specifier Note: Revise paragraph below to suit project requirements. Add section numbers per CSI *Masterformat* and specifier's practice.

- B. Related Sections: Section(s) related to this section include:
 - 1. Metal Roof Deck: Division 5 Metal Deck Sections.
 - 2. Wood Framing and Decking: Division 6 Rough Carpentry Section.
 - 3. Flashing and Trim: Division 7 Flashing and Sheet Metal Section.
 - 4. Coping and Gravel Stops: Division 7 Roof Specialties and Accessories Section.
 - 5. Sealants: Division 7 Joint Sealers Sections.

Specifier Note: Paragraphs below list industry standards referenced in this section. Verify use of listed standards and add edition date of standards retained. *Conditions of the Contract* or Division 1 References Section may establish edition date of standards referenced. This article does not require compliance with standard, but is merely a listing of references used.

1:02 REFERENCES

- A. American Society for Testing and Materials (ASTM):
- B. Underwriters Laboratories (UL Classified Tests):
- C. Sheet Metal and Air Conditioning Contractors National Association (SMACNA):
 - 1. SMACNA Architectural Sheet Metal Manual

1:03 SYSTEM DESCRIPTION

- A. Performance Requirements: Provide sheet metal roofing that has been manufactured, fabricated and installed to withstand structural and thermal movement, wind loading and weather exposure to maintain manufacturer's performance criteria without defects, damage, failure of infiltration of water.
 - 1. Wind-Uplift: Roof panel assembly shall comply with UL Classification 580 for UL Classified 90 rated assemblies
 - 2. Static Air Infiltration: Completed roof system shall have a maximum of .06 cfm/sf with 6.24 kPa air pressure differential as per ASTM E283/1680.
 - 3. Water Infiltration: No evidence of water penetration at an inward static air pressure differential of not less than 6.24 psf (43 kPa) and not more than 12.0 psf (83 kPa) as per ASTM E331/1646.

Specifier Note: Article below includes submittal of relevant data to be furnished by Contractor either before, during or after construction. Coordinate this article with Architect's and Contractor's duties and responsibilities in *Conditions of the Contract* and Division 1 Submittal Procedures Section.

1:04 SUBMITTALS

- A. General: Submit listed submittals in accordance with *Conditions of the Contract* and Division 1 Submittal Procedures Section.
 - 1. Product Data: Submit product data, including manufacturer's SPEC-DATA® product sheet, for specified products. (Make Spec-Data link to information located in the product section.
- B. Shop Drawings:
 - 1. Submit complete shop drawings and erection details, approved by the metal roofing manufacturer, to the architect (owner) for review. Do not proceed with manufacturer of roofing materials prior to review of shop drawings and field verification of all dimensions. Do not use drawings prepared by the architect (owner) for shop or erection drawings.
 - 2. Shop drawings show roof plans, elevations, methods of erection, and flashing details.
- C. Performance Tests:
 - 1. Submit certified test results by a recognized testing laboratory in accordance with specified test methods for each panel system.
- D. Samples: Submit selection and verification samples for finishes, colors and textures.
- E. Quality Assurance Submittals: Submit the following:
 - 1. Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and physical requirements.
 - 2. Manufacturer's Instructions: Manufacturer's installation instructions.
- F. Closeout Submittals: Submit the following:
 - 1. Operation and Maintenance Date: Operation and maintenance date for installed products in accordance with Division 1 Closeout Submittals, Maintenance Data and Operation Data Section. Include methods for maintaining installed products and precautions against cleaning materials and methods detrimental to finishes and performance.
 - 2. Project Warranty: Warranty documents specified herein.
 - A: Manufactures warranty: Submit, for owners acceptance, manufactures standard warranty document excuted by authorized company official. Manufacturer's warranty is in addition to and not limited of, other rights the owner may have under the contract documents.

Specifier Note: Coordinate paragraph below with manufacturer's warranty requirements. Metal Roofing Systems offers a 20-year non-prorated warranty covering a MRS finish, including color, fade, chalking and film integrity. Consult with manufacturer for specific project warranty requirements

- 1. Warranty Period: (specify term) years commencing on Date of Substantial Completion.

Specifier Note: Retain article below for proprietary method specification. Add product attributes, performance characteristics, material standards and descriptions as applicable. Use of such phrases as "or equal" or "or approved equal" may cause ambiguity in the specifications. Such phrases require verification - procedural, legal, regulatory and responsibility - for determining equivalence of products.

- 3. Record Documents: Project record documents for installed materials in accordance with Division 1 Closeout Submittals,, Project Record Documents Section.

Specifier Note: Article below should include prerequisites, standards, limitations and criteria which establish an overall level of quality for products and workmanship for this section. Coordinate below article with Division 1 Quality Assurance Section.

1:05 QUALITY ASSURANCE

- A. Installer Qualifications: Installer experienced in performing work of this section who has specialized in the installation of work similar to that required for this project.

- B. Sheet Metal Industry Standard: Comply with Sheet Metal and Air Conditioning Contractors National Association(SMACNA) *Architectural Sheet Metal Manual*.

Specifier Note: Retain paragraph below for erected assemblies, either onsite or offsite, required for review of Construction, coordination of work of several sections, testing or observation of operation. Mock-ups establish Standards by which work will be judged. Coordinate below with Division 1 Quality Control, Mock-up Requirements Section.

- C. Pre-Installation Meetings: Conduct pre-installation meeting to verify project requirements, substrate conditions, Manufacturer's installation instructions and manufacturer's warranty requirements. Comply with Division 1 Managements and Coordination, Project Meetings Section.

1:06 DELIVERY, STORAGE AND HANDLING

- A. General: Comply with Division 1 Product Requirements Sections.
 - 1. Ordering: Comply with manufacturer's ordering instructions and lead-time requirements to avoid construction delays.

- B. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact. Identify fabricated components with UL 90 Classified label where appropriate.

- C. Storage and Protection: Store materials protected from exposure to harmful conditions. Store material in dry, above ground location.
 - 1. Stack prefinished material to prevent twisting, bending, abrasion, scratching and denting. Elevate one end of each skid to allow for moisture to run off.
 - 2. Prevent contact with material that may cause corrosion, discoloration or staining.
 - 3. Do not expose to direct sunlight or extreme heat trim material with factory applied strippable film.

1:07 PROJECT CONDITIONS

- A. Field Measurements: Verify actual measurements/openings by field measurements before fabrication; show recorded measurements on shop drawings. Coordinate field measurements, fabrication schedule with construction progress to avoid construction delays.

Specifier Note: Coordinate article below with *Conditions of the Contract* and with Division 1 Closeout Submittals, Warranty Section.

1:08 WARRANTY

- A. Project Warranty: Refer to *Conditions of the Contract* for project warranty provisions.

- B. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to and not a limitation of, other rights Owner may have under the Contract Documents.

Specifier Note: Coordinate paragraph below with manufacturer’s warranty requirements. Metal Roofing Systems offers a 20-year nonprorated warranty covering MRS finish, including color, fade, chalking and Film integrity. Consult with manufacturer for specific project warranty requirements.

1. Warranty Period: (Specify term) years commencing on Date of Substantial Completion.

PART 2 PRODUCTS

Specifier Note: Retain article below for proprietary method specification. Add product attributes, performance characteristics, material standards and descriptions as applicable. Use of such phrases as “or equal” or “or approved equal” may cause ambiguity in the specifications. Such phrases require verification - procedural, legal, regulatory and responsibility - for determining equivalence of products.

2:01 SHEET METAL ROOFING

A. Manufacturer: Metal Roofing Systems

Specifier Note: Paragraph below is a supplement to *CSI Masterformat* and an addition to MANU-SPEC. Retain or delete paragraph below to suit project requirements and specifier’s practice.

1. Contact: 7670 Mikron Drive, Stanley, NC 28164; Telephone (704) 820-3110; Fax (704) 820-0113

Specifier Note: Paragraphs below list proprietary roof panels offered by Metal Roofing Systems. Select roof panels appropriate to project. Panels are factory formed in lengths up to 55’ (16.2 m). Matching flashing and trim may be factory formed or field formed from MRS material. Consult with manufacturer regarding product options. Selection product characteristics required; delete characteristics not required. Refer to manufacturer’s SPEC-DATA product sheet.

Specifier Note: Below (MRS System 2000) panels are factory formed and tension leveled with an optional factory applied sealant bead for improved weather resistance. Panels feature a 2” (50.2 mm) leg height and a continuous inter-lock for structural performance and wind resistance. A concealed fastener system allows for thermal expansion/contraction while providing holddown strength. Two clips are available: a standard clip for mansard and fascia applications and a high performance clip roofing application and UL Classified 90 rated assemblies. Panels carry a UL Classified 90 rating over designated substrates and assemblies including 5/8” (16 mm) plywood, purlins and rigid insulation in conjunction with bearing plates (UL Classification Construction No. 90, 176, 180,238, and 238A. Panel features include Stiffener beads. Meets performance requirements of ASTM E1680 air infiltration test, ASTM E1646 water penetration test and ASTM E1592 air bag test. Consult with Metal Roofing Systems.

B. MRS SYSTEM 2000 panels and trim:

1. Seam Height: 1 3/4” (45 mm) minimum seam height.
2. Material: (24 ga.), (22 ga) G-90 Hot-dipped Galvanized Steel
3. Material: .032” ga (.8mm), .040” ga (.1mm) alloy 3105-H14 aluminum
4. Panel Dimension: 12” (305 mm), 14” (356 mm), 16” (406 mm), 18” (457 mm) o.c.

Specifier Note: Below eave notching is an option with manufacturer. Retain or delete as applicable.

5. Texture: (Smooth) (Stucco embossed texture) (Striations) (Stress Ribs).
6. Rating: UL Classified 90 rated (wind uplift) panel assembly.
7. Flashing and Trim: (Aluminum, (.032” ga, .040” ga, .050” ga (.8mm, .1mm, .13mm))(Steel, (24 ga, 22 ga))
8. Fasteners: Standard galvanized steel, non-penetrating high performance clips for roofing application and UL Classified 90 rated (wind uplift) assemblies and standard clips for mansard and fascia applications.

Specifier Note: Below sealant bead is an option with manufacturer. Retain or delete as applicable.

9. Sealant Bead: Factory applied sealant bead.

C. Panel Finish:

1. Panel Topside: MRS SYSTEM 2000 finish' color selected from Metal Roofing Systems. standard colors:
2. Panel Underside: Polyester washcoat with dry film thickness of 0.3 mils.

Specifier Note: Coordinate paragraph below with project requirements for selected sheet metal roofing system.

D. MRS SYSTEM 2000 Flashing and Trim: Manufacturer's standard flashing and trim profiles, factory formed, gauge as recommended by manufacturer, color and finish to match metal roofing panels.

Specifier Note: Edit paragraph below to suit project requirements, if substitutions are permitted, edit text below. Add text to refer to Division 1 Product Requirements, Product Substitution Procedures Section.

E. Substitutions: No substitutions permitted.

2:02 RELATED MATERIALS

A. General: Coordinate use of related materials:

1. Underlayment: ASTM D226, Type II No. 30 asphalt saturated organic roofing felt. Refer to Division 7 Roofing Sections.
2. Plywood Deck: 5/8" (16 mm) nominal thickness. Refer to Division 6 Rough Carpentry Section.
3. Nailable Insulation: 1" (25 mm) minimum to 3 1/2" (89 mm) maximum nominal thickness classified polyisocyanurate foamed plastic, 2 pct density, with factory laminated 7/16" (11 mm) thick APA rated Oriented Strant Board (OSB). Refer to Division 7 Insulation Sections or Division 6 Rough Carpentry Section.
4. Sealants: Elastomeric joint sealants. Refer to Division 7 Joint Sealers Sections.

5. Bituminous Coating: Cold-applied asphaltic mastic. Provide compound free of asbestos fibers, sulfur components and other harmful impurities. Refer to Division 7 Damp proofing Section.

2:03 FABRICATION

A. General:

1. Continuous Length: Fabricate panels 55' (16.2 m) and less in one continuous length.
2. Trim and Flashings: Fabricate trim and flashings from same material as roof system material.
3. Portable Roll Former: Panels fabricated by portable roll former shall not be approved.

Specifier Note: Coordinate article below with finishes specified in sheet metal roofing article above.

2:04 FINISHES

A. MRS SYSTEM 2000 Factory Applied Finish:

1. Topside: Full-strength fluoropolymer (70% Kynar® 500 or Hylar® resin) system of 1.0 mil (.025 mm) total dry film thickness.
2. Underside: Wash coat of 0.3 - 0.4 mil dry film thickness.
3. Texture: (Smooth texture, dull matte specular gloss 25 - 35% at 60°) (Standard E-5 stucco embossed pattern).
4. Protective film: Strippable vinyl film applied during panel fabrication and finishing.

PART 3 EXECUTION

Specifier Note: Article below is an addition to the CSI SectionFormat and a supplement to MANU-SPEC. Revise Article below to suit project requirements and specifier's practice.

3:01 MANUFACTURER'S INSTRUCTIONS

A. Compliance: Comply with manufacturer's product data, recommendations and installations instructions for substrate verification, preparation requirements and installation.

1. Strippable Film: Remove manufacturer's protective film, if any, from surfaces of roofing panels.

3:02 EXAMINATION

A. Site Verification of Conditions: Verify substrate conditions, which have been previously installed under other sections, are acceptable for project installation in accordance with manufacturer's instructions.

3:03 PREPARATION

A. Coordination: Coordinate metal roofing with other Work (drainage, flashing and trim, deck substrates, parapets, copings, walls) and other adjoining work to provide a non-corrosive and leak-proof installation.

B. Dissimilar Metals: Prevent galvanic action of dissimilar metals.

Specifier Note: Coordinate article below with manufacturer's recommended installation details.

3:04 INSTALLATION

A. General: Install metal roofing panels to profiles, patterns and drainage indicated and required for leak-proof installation. Provide for structural and thermal movement at work. Seal joints for leak-proof installation.

1. Seams: Provide uniform, neat seams.
2. Fasteners: Conceal fasteners where possible in exposed work. Cover and seal fasteners and anchors for watertight and leak-proof installation.
3. Sealant-Type Joints: Provide sealant-type joint where indicated. Form joints to conceal sealant. Comply with Division 7 Joint Sealants Section for Sealant installation.

3:05 FIELD QUALITY REQUIREMENTS

A. Site Tests (Post Installation Testing): Owner reserves right to perform post installation testing of installed sheet metal roofing.

Specifier Note: Edit paragraph below. Establish number and duration of periodic site visits with owner and Manufacturer and specify below. Consult with manufacturer for services required. Coordinate paragraph below with Division 1 Quality Assurance Section. Delete paragraph if manufacturer field services not required.

B. Manufacturer's Field Services: Upon Owner's request, provide manufacturer's field service consisting of product use recommendations and periodic site visit for inspection of product installation in accordance with manufacturer's instructions

3:06 CLEANING

A. Cleaning: Remove temporary coverings and protection of adjacent work areas. Repair or replace damaged installed products. Clean installed products in accordance with manufacturer's instructions prior to owner's acceptance. Remove construction debris from project site and legally dispose of debris.

3:07 PROTECTION

A. Protection: Protect installed product from damage during construction.