

SECTION 07412 – COMPOSITE METAL WALL PANEL SYSTEM (R-Trac H.V.H.Z)

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Metal-faced composite wall panels and related components.
 - 2. Polyisocyanurate insulation for sheathing and underlayment applications. (must include section 07210)
- B. Related Sections include the following:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.
 - 2. Division 05: Section “Cold-Formed Metal Framing” for secondary support framing supporting metal wall panels.
 - 3. Division 07: Section for vapor barrier and/or Moisture barrier.

1.3 DEFINITIONS

- A. Metal Wall Panel Assembly: Metal wall panels, attachment system components, Polyisocyanurate insulation for sheathing and accessories necessary for a complete weather tight system.

1.4 PERFORMANCE REQUIREMENTS

- A. Provide: Metal wall panel assemblies that comply with performance requirements specified within this section. Manufacturers’ standard assemblies indicated for this Project, shall have been tested by a certified (3rd party) testing and inspecting agency.
- B. Structural Performance: Provide metal wall panel assemblies and continuous insulation sheathings capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated, based on testing according to ASTM E 330:
 - 1. Wind Loads: Determine loads based on the following minimum design wind pressures:
 - a. Uniform pressure of 25 psf, inward or outward. Maximum design pressure of 120 PSF inward or outward

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2. Deflection Limits: Metal wall panel assemblies shall be shown to withstand test pressures with deflection no greater than 1/180 perimeter and L/60 of the span and no evidence of material failure, structural distress, or permanent deformation exceeding 0.4 percent of the clear span.
- C. Specified panel system shall be a pressure equalized rain screen system tested and passed to AAMA 508. Also, system shall have been tested and compliant with AAMA 509 requirements with a water rating of .40 Fl oz/FT² and an air rating of .57 CFM/FT².
- D. Product Test Reports: Florida Product Approval # 16406
- E. Large Missile Impact: Provide metal panel system which has been successfully tested to and is compliant with the requirements of (Testing Application Standard for the State of Florida) TAS 201, 202 and 203. Panel system shall have achieved “pass” status without the use of supplemental materials such as plywood or panel stiffeners.
- F. Polyisocyanurate insulation shall meet ANSI/SBCA FS 100-2012 Standard Requirements for Wind Pressure Resistance of Foam Plastic Insulating Sheathing Used in Exterior Wall Covering Assemblies.
- G. Surface-Burning Characteristics:
 1. Provide metal wall panels with the following surface-burning characteristics as determined by testing identical products per ASTM E 84 under a testing and inspecting agency acceptable to authorities having jurisdiction:
 - a. PE Core:
 - i. Flame-Spread Index: < 25
 - ii. Smoke-Developed Index: < 450
 - OR
 - b. FR Core
 - i. Flame-Spread Index: < 25
 - ii. Smoke-Developed Index: < 450
 2. Provide Class A rigid foil-faced Polyisocyanurate continuous insulation with the following surface-burning characteristics as determined by testing per ASTM E 84 under a testing and inspecting agency acceptable to authorities having jurisdiction:
 - a. ECOMAXci:
 - i. Flame-Spread Index: <25

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ii. Smoke-Developed Index: <450

1.5 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of metal wall panel and accessory.
- B. Shop Drawings: Show fabrication and installation layouts of metal wall panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.
 - 1. Accessories: Include details of all integral panel components and their interface with adjacent materials.
 - 2. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation. (Optional)
- C. Samples for Initial Selection: For each type of metal wall panel indicated with factory-applied color finishes.
 - 1. Metal Wall Panels: Two (2) each, three inches by five inches minimum, panel samples with joinery included as part of the sample.
- D. Samples for Verification
 - 1. Metal Wall Panels: Two (2) each, six inches by ten inches minimum, panel samples with joinery included as part of the sample.
 - 2. ECOMAXci rigid Polyisocyanurate continuous insulation: each four inches by eight inches.
 - 3. Accessories: Twelve-inch long samples for each type of accessory system tape and flashing.
- E. ACM/MCM Compatibility and Adhesion Test Reports, When Applicable: From sealant manufacturer indicating the following:
 - 1. Materials forming joint substrates and joint sealant backings have been tested for compatibility and adhesion with joint sealants.
 - 2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.
- F. Maintenance Data: For metal wall panels to include in maintenance

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manuals.

- G. Warranties: Special warranties specified in this Section as well as Section 07210

1.6 QUALITY ASSURANCE

A. Panel System Manufacturer:

1. ACM/MCM Panel System Manufacturer responsibilities include engineering and fabricating metal wall panel assemblies and when required, provide professional engineering services and stamp, showing engineering responsibility.
2. ACM/MCM Panel System Manufacture shall have a minimum of 5 year's experience with the fabrication of MCM panels.
3. Foam Panel Manufacturer shall have a minimum 10 year's experience with the manufacturing of the rigid Polyisocyanurate Continuous Insulation.
4. Drawing Responsibility: Preparation of Shop Drawings and comprehensive engineering analysis by the panel system manufacture, not a subcontractor.

- B. Fabrication Location: Panels to be factory assembled at manufacturer's facility. Panels fabricated on site shall not be permissible.

- C. Installer: MCM installers shall be certified by MCM fabricator.

- D. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated, as documented according to ASTM E 548.

- E. Source Limitations: Obtain each type of metal wall panel through one source from a single fabricator.

- F. Product Options: Drawings indicate size, profiles, and dimensional requirements of metal wall panels and are based on the specific system indicated.

- G. System manufacturer to have established a written quality assurance program. QA program to be monitored and audited by a third party independent inspection agency.

- H. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination". Review methods and procedures related to metal wall panel assemblies

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including, but not limited to, the following:

1. Meet with Owner, Architect, Owner’s insurer if applicable, testing and inspecting agency representative, metal wall panel installer, foam sheathing installer, metal wall panel manufacturer’s representative, structural-support installer, and installers whose work interfaces with or affects metal wall panels including installers of doors, windows, and louvers.
 2. Review and finalize construction schedule and verify availability of materials, Installer’s personnel, equipment and facilities needed to make progress and avoid delays.
 3. Review methods and procedures related to metal wall panels installation, including fabricator’s written instructions.
 4. Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.
 5. Review flashings, special siding details, wall penetrations, openings, and condition of other construction that will affect metal wall panels.
 6. Review governing regulations and requirements for insurance, certificates, and testing and inspecting if applicable.
 7. Review temporary protection requirements for metal wall panel assembly during and after installation.
 8. Review wall panel observation and repair procedures after metal wall panel installation.
 9. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.
- I. MCM Manufacturer Qualifications: Company with a minimum of 5 years of continuous experience manufacturing panel material of the type specified:
1. Able to provide specified warranty on finish.
 2. Able to provide a list of 5 other projects of similar size, including approximate date of installation and name of Architect for each.
 3. Able to produce the composite material without outsourcing of the coating or laminating process.
 4. Able to provide a certificate of registration to ISO 9001-2000
- 1.7 DELIVERY, STORAGE, AND HANDLING
- A. Deliver components, sheets, metal wall panels, insulation bundles, and other manufactured items so as not to be damaged or deformed. Package metal wall panels for protection during transportation and handling. (reference Section 07210)

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- B. Unload, store, and erect metal wall panels in a manner to prevent bending, warping, twisting, and surface damage.
- C. Stack metal wall panels on platforms, pallets, or within crates, covered with suitable weathertight and ventilated covering. Store metal wall panels to ensure dryness, with positive slope for drainage of water. Do not store metal wall panels in contact with other materials that might cause staining, denting, or other surface damage.
- D. Leave protective strippable film as applied by MCM sheet manufacturer on panel face throughout fabrication and installation. Remove only after panels are installed and not subject to damage.

1.8 PROJECT CONDITIONS

- A. Field Measurements: Verify locations of structural members and wall opening dimensions by field measurements before metal wall panel fabrication, as the project schedule permits.

1.9 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal wall panel assemblies that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures, including rupturing, cracking, or puncturing.
 - b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - 2. Warranty Period: Two (2) years from date of Substantial Completion.
- B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal wall panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Panel Finish: Finish deterioration shall be defined as:
 - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 - 2. Finish Warranty Period: Twenty (20) years from date of Substantial Completion.

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3. Panel Integrity: 10 Years commencing on the date of substantial completion.
- C. Continuous Insulation: Reference Section 07210 and manufacturer's specific warranties.

PART 2 – PRODUCTS

- 2.1 MCM Sheet Manufacturer:
 - A. Products from the following manufacturers will be acceptable provided that they meet the requirements of this specification:
 1. Alpolic, by Mitsubishi Plastics Composites America, Inc.
- 2.2 Panel System Manufacturer:
 - A. The following requirements apply for product selection:
 1. Basis of Design: Altech Panel Systems (678-721-4569) or (800-684-6178). System: R-Trac H.V.H.Z (include Section 07210 for Rmax ECOMAXci)
- 2.3 PANEL MATERIALS:
 - A. Composite Metal Panel System:
 1. Rear Ventilated Pressure Equalized Rain Screen / Dry Joinery System
 - a. Panel system shall be nominal two-inch depth with shop applied, concealed continuous perimeter extrusions. (Note: Intermittent extrusions at panel perimeter are not acceptable.) Panel system shall employ shop attached clips with sliding capability for exact location over supports, while allowing for thermal movement in all four directions. To minimize thermal stresses on the panels, fixed attachment systems that don't allow free movement are not permissible.
 - b. Panel system shall have minimal 1/2" or as indicated at the drawings vertical and horizontal joinery. Panel system shall be of rainscreen type with no exposed sealants permissible in the panel to panel joinery. Caulking is allowed only for non-exposed areas (e.g. top of roof coping). See Section specifications for caulking
 - c. Panel joints to utilize an integral spline of the same composition as the panels. Splines to be held in place by slots in the perimeter panel extrusions. Bonding of metal material within the joinery to simulate an encapsulated spline is not permissible.
 - d. All rivets and / or fasteners that are used to attach the MCM sheet to the

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extrusions shall be countersunk, painted the same color as the panel and uniformly aligned both vertically and horizontally.

- e. All internal weeps shall be baffled and aligned vertically
- f. All panel corners shall be reinforced with aluminum angles
- g. All routed folds at panel perimeter shall be reinforced with continuous extrusion system.
- h. Panel system shall be provided in panel modules and lengths as indicated on the Contract drawings (up to 60” in the short direction and up to 240” in the long direction).
- i. Panel system to be applied over properly installed Rmax ECOMAXci continuous insulation
- j. No caulks or sealants are allowed at the external reveal.

B. MCM – Aluminum Composite Material: Formed with 0.020-inch thick coil-coated aluminum sheet facings. MCM sheets to be formed in a continuous, in-line process:

- 1. MCM Thickness: 0.157 inch (4 mm).
- 2. Core: Standard PE or FR as required.
- 3. Bond Strength: (ASTM D1781): 22 in-lb/in minimum.
- 4. Coil coated with a fluoropolymer paint finish that meets or exceeds values expressed in AAMA 2605.
- 5. Exposed Finish – (Choose one color type a. through d.)
 - a. 2-Coat Fluoropolymer: .8 mil nominal coil coated color with a fluoropolymer paint finish. Color coat to be applied over .2 mil nominal coil coated primer coat.

OR

- b. 3-Coat Fluoropolymer: .8 mil coil coated fluoropolymer clear coat finish applied over a coil coated .8 mil fluoropolymer color coat. Fluoropolymer based coats to be applied subsequent to .2 mil nominal coil coated primer coat.

OR

- c. 2-coat Mica: .8 nominal coil coated fluoropolymer color coat containing Mica flakes within the paint finish. Color coat to be applied over .2 mil coil coated primer coat.

OR

- d. 3-coat coil coated Mica/Pearlescent fluoropolymer based finish.

C. Continuous Insulation – Reference and include Section 07210 for Rmax ECOMAXci Continuous Insulation and its accompanying tape and flashing as underlayment sheathing system for above described MCM panels.

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1. Closed-cell Polyisocyanurate insulation with a 12mil glass fiber reinforced foil facer on one side and a 10mil glass fiber reinforced foil facer on the other side.
 2. Density (Nominal) in accordance with ASTM D1622: 2.0 pcf.
 3. Compressive Strength in accordance with ASTM D1621: 25 psi.
 4. Flame Spread in accordance with ASTM E84: 25 or less.
 5. Smoke Developed in accordance with ASTM E84: 450 or less.
 6. Water Vapor Transmission in accordance with ASTM E96: Less than 0.3 perms.
 7. Water Absorption in accordance with ASTM C209: Less than 1 percent by volume.
 8. Dimensional Stability in accordance with ASTM D2126: Less than 2 percent linear change.
 9. Air Permeance in accordance with ASTM E2178: Less than 0.02 l/ssm.
 10. Thickness: 2.0 inches (51mm).
 - a. Thermal Resistance (R): 13.1.
 11. Thickness: 2.5 inches (64mm).
 - a. Thermal Resistance (R): 16.7.
 12. Thickness: 3.0 inches (76mm).
 - a. Thermal Resistance (R): 20.3.
- 2.4 ACCESSORIES
- A. Wall Panel Accessories: Provide components required for a complete metal wall panel assembly including trim, copings, fasciae, splines, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal wall panels, unless otherwise indicated.
- 2.5 FABRICATION
- A. General: Fabricate and finish metal wall panels and accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.
 1. Form panel lines, breaks and angles to be sharp and true, with surfaces free from warp and buckle.
 - B. Fabricate metal wall panels in a manner that would weep any possible condensation to the exterior.
 - C. Provide panel profile for full length of panel.

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- D. Fabricate metal wall panel joints in a manner that will minimize noise from movements within panel assembly.
- E. Metal-Faced Composite Wall Panels:
 - 1. Fabricate panels, as required to comply with deflection limits, without the use of backside panel stiffeners.
 - 2. Fabricate panels with sharply cut edges, with no displacement of face sheets or external exposure of core material.
 - 3. Dimensional Tolerances:
 - a. Length: Plus 0.375 inch (9.5 mm).
 - b. Width: Plus 0.188 inch (4.8 mm).
 - c. Thickness: Plus or minus 0.008 inch (0.2 mm).
 - d. Panel Bow: 0.8 percent maximum or panel length or width.
 - e. Squareness: 0.2 inch (5 mm) maximum.

2.6 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal wall panel supports, and other conditions affecting performance of work.
 - 1. Examine primary and secondary wall framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by metal wall panel manufacturer.
 - 2. Examine continuous insulation sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by panel system manufacturer/installer. Confirm Polyisocyanurate fastening pattern is per design loads as shown on Florida Product Approval #16406. Confirm all taping and flashings are in accordance to Florida Product Approval # 16406
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

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3.2 COMPOSITE WALL PANEL INSTALATION, GENERAL

- A. General: Install metal wall panels in orientation, sizes, and locations indicated on approved shop drawings. Install panels perpendicular to girts and subgirts, unless otherwise indicated. Anchor metal wall panels and other components of the Work securely in place, with provisions for thermal and structural movement.

- B. Install attachment system required to support wall panels and to provide a complete weathertight wall system, including Polyisocyanurate sheathing, tapes, flashing, subgirts, perimeter extrusions, tracks, panel clips, and anchor channels as may be required. Sealants shall be utilized at typical vertical or horizontal joints, where applicable. Panel joints shall include a spline fabricated from same ACM system as panels.

3.3 ERECTION TOLERANCES

- A. Installation Tolerances: Shim and align metal wall panel units within installed tolerance of 1/4-inch in 20-feet (6-mm in 6-m), non-accumulative, on level, plumb, and location lines as indicated and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.

3.4 CLEANING AND PROTECTION

- A. Remove temporary protective coverings and strippable films, if any, as metal wall panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal wall panel installation, clean finished surfaces as recommended by metal wall panel manufacturer. Maintain in a clean condition during construction.

END OF SECTION 07412