



SECTION 07 42 43 ALUMINUM COMPOSITE WALL PANEL SYSTEM

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Includes drawings and provisions of the General Conditions, Supplementary Conditions and the sections included under Division 1 Specification Sections.
- B. Related Sections
 - 1. Section 05 10 00 - Structural Steel
 - 2. Section 05 40 00 - Cold-Formed Metal Framing
 - 3. Section 06 10 00 - Rough Carpentry
 - 4. Section 06 16 43 - Gypsum Sheathing
 - 5. Section 07 25 00 - Air Barriers
 - 6. Section 07 62 00 - Sheet Metal Flashing and Trim
 - 7. Section 07 92 00 - Joint Sealants

1.2 SUMMARY

- A. This Section includes; Aluminum composite panels fabricated into a pressure-equalized Rain Screen system to be used as exterior or interior wall and soffit cladding. Panel clips, splines, and aluminum extrusions are part of the fabricated panel system.

1.3 PERFORMANCE REQUIREMENTS

- A. Fabricated system shall meet or exceed the specified design and performance requirements. Testing will be documented and certified by an independent testing agency prior to bid. Testing shall include a minimum of the following:
 - 1. Air Infiltration: Panel system shall not have an air infiltration rate of more than .117/cfm psf of pressure when tested per ASTM E 283-04 and static air pressure differential of 1.57 psf when tested per AAMA 508-07.
 - 2. Cyclic Static Air Pressure Differential: Panel system shall be pressure cycle tested per ASTM E 1233. Testing consists of 100 cycles of pressures from 5 psf to 25 psf and system must equalize in less than 0.08 seconds per AAMA508-07.
 - 3. Static Water Penetration: Panel system shall have no water penetration as defined per ASTM E 331 when tested at a pressure of 6.24 psf positive static air



pressure equivalent for a 15 minute duration with a minimum water application rate of 5 gal/hr/ft².

4. Dynamic Water Penetration: Panel system shall have no uncontrolled water leakage as defined by AAMA 501.1-05 when tested at pressure of 6.24/psf for a 15 minute duration with a minimum water application rate of 5 gal/hr/ft².
5. Uniform Load Deflection/Structural Performance: Panel system tested per ASTM E 330-02 will not deform or fail structurally at a design pressure of 60 psf.
 - a. At +100.25 pounds per square foot design load: No damage.
 - b. At -100.25 pounds per square foot design load: No damage.
 - c. At +150.38 pounds per square foot (Overloads): No damage.
 - d. At -150.38 pounds per square foot (Overloads): No visible damage

1.4 DESIGN REQUIREMENTS

- A. Provide wall panel assemblies capable of withstanding dead and live loads caused by positive and negative wind pressures, snow loads and normal thermal movement without evidence of permanent defects of assemblies or components
 1. Live and Dead Load: As required by local building code.
 2. Wind Load: Uniform pressure ___Lbs./sq. ft., acting inward or outward.
 3. Wall Panel Deflection: L/60.
 4. Perimeter Framing Deflection: L/180.
 5. Thermal Movement: Design system to accommodate vertical and horizontal thermal movement of components without causing distortion, excessive stress on fasteners, or oil canning when subjected to recurring temperature variations.
 6. Drainage: Design for positive drainage of water leakage and condensation to exterior of wall panel system.
 7. Tolerance of Substructure: Design system to accommodate up to 1/8 inch in ten (10) feet variation out of plane.
 8. Seismic Design: Conform to International Building Code for the Seismic Category appropriate for location of system installation.
 9. Design system based on Rain Screen principle. Incorporate means of draining moisture to the exterior

1.5 QUALITY ASSURANCE

- A. Supplier shall design, supply and fabricate work of this Section.
- B. Supplier shall have a minimum of five years proven experience fabricating and supplying aluminum composite and plate wall panel projects.



- C. Installer shall have a minimum of five years proven experience installing metal wall panel systems and employ a jobsite foreman with a minimum three years' experience.
- D. Installer shall be trained and authorized in writing by the metal panel fabricator.
- E. Professional Engineer qualifications: An engineer licensed and qualified to provide engineering services and stamp drawings in the state where the project is located.

1.6 SUBMITTALS

- A. Submit samples and product data in accordance with Section [01 33 00].
- B. Submit duplicate, minimum 3-½" x 3-½" samples of each color selected.
- C. Submit mock-up panel 2'-0 x 2'-0.
- D. Product data for each type of product specified.
- E. Product Test Reports: In compliance with requirements of industry standards and conducted by an independent test agency.

1.7 SHOP DRAWINGS

- A. Submit shop drawings in accordance with Section [01 33 00].
- B. Indicate elevations, profiles, dimensions and thickness of panels.
- C. Indicate location and detail of joints including joints necessary to accommodate thermal movement.
- D. Indicate attachment clips, joint extrusion system and installation details.
- E. Show fastening and anchoring details as required complying with specified design and local building code requirements.
- F. Drawings shall be signed and sealed by a Professional Engineer indicating proper attachment of the metal panel assembly to withstand the specified loads.
- G. Panel attachment schedule shall be identified on the shop drawings as to building location to facilitate panel removal and replacement.

1.8 PRODUCT DELIVERY, HANDLING AND STORAGE

- A. Protect panel finish and sides of panels using a plastic film adhered to panel in accordance with panel manufacturer's recommendations. Handle materials carefully to avoid damage to material and finishes.
- B. Store components and materials in accordance with panel manufacturer's recommendations.



1.9 WARRANTY

- A. Submit Manufacturer's standard warranty documents executed by an authorized company official.
- B. Material Manufacturer: Repair or replace defective materials for a period of five (5) years.
- C. Panel System Fabricator: Repair or replace products or component which fail due to faulty workmanship for a period of two (2) years.
- D. Panel System Installer: Repair or replace products or component which fail due to faulty workmanship for a period of two (2) years.
- E. Manufacturer Paint Finish Warranty: Coating Manufacturer warrants paint for a period of twenty* (20) years after the effective date shall perform as follows:
 - 1. Will not chip, crack or peel (lose adhesion) per ASTM D3359 and D2794.
 - 2. Will not chalk in excess of ASTM D4214-89 number eight (8) rating per the procedure outlined in ASTM D4214-89 specification test.
 - 3. Will not change color more than five (5) Delta-E Hunter units per ASTM D2244.NOTE: Color change on surfaces may not be uniform if panel surfaces on the same project are not aligned to the sun in the same area.

****Inquire for warranty coverage and duration in marine or industrial applications.***

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Metal Composite Material Sheet Manufacturers:
 - 1. Alcoa, Inc., Reynobond ACM: www.alcoa.com
 - 2. Alpollic Materials, Mitsubishi Plastics: www.alpollic-northamerica.com
 - 3. Larson North America, Alucoil: www.alucoil.com
 - 4. Fairview Architectural, Vitrabond:
<http://www.fairviewarchitecturalusa.com/home>
- B. Fabricator: Phoenix Panels, 8650 Line Road, Lynden, WA 98264.
Phone 360-354-3155 Fax 360-354-3174 www.phoenixpanels.net

2.2 MATERIALS

- A. ALUMINUM COMPOSITE MATERIAL SYSTEM
 - 1. PHOENIX Pressure-equalized Rain Screen System (select one of the following):
 - a. FLEX Panel system:
 - i. 1 ¾" deep panel profile. Available 4" – 5'-0" wide, up to 16'-0" long.



- ii. Dry joint seal with ½” or 5/8” reveal lines. (Wet joint seal available)
 - iii. Single panel design wraps into a window, door or corner with unique “spear clip” design. (Inquire for dimensions)
 - iv. Self-centering clip design for main panel attachment.
 - b. RISE Panel system:
 - i. 1 ½” deep panel profile. Available 4” – 5’-0” wide, up to 16’-0” long.
 - ii. Dry joint seal with ½” or 5/8” reveal lines. (Wet joint seal available)
- 2. Aluminum face sheet: Aluminum alloy 3000 series, thickness 0.5 mm (0.02”), Anodized Aluminum shall be alloy 5000 series, thickness 0.5 mm (0.02”).
- 3. Panels shall be 4 mm (0.16”), aluminum composite material. Panel consists of two sheets of aluminum bonded to either side of an extruded polyethylene (thermoplastic core), formed in a continuous process without the use of glue or adhesive between dissimilar materials. Bond integrity testing to adhere to ASTM D 1781.
- 4. Core material: Select one:
 - a. Polyethylene Core (PE) - Standard shall have Class “B” Building Material Rating (as tested in accordance with ASTM E84 Steiner Tunnel Test for interior applications). OR
 - b. Fire Retardant Core (FR) Standard shall be non-combustible and shall have a Class “A” Building Material Rating (as tested in accordance with ASTM E84 Steiner Tunnel Test for interior applications). FR core shall comply with NFPA 285 test data for (exterior applications).
- B. EXTRUSIONS: Aluminum perimeter extrusions and extrusion clips for attaching panels to the sub-structure. Comply with ASTM B221, alloy 6063-T6 and/or 6061-T6.
 - a. Proprietary attachment to panel eliminates exposed fasteners or rivets.
- C. SPLINE: Joint spline strip shall be same material as panel system.
- D. TOLERANCES:
 - 1. Panel Bow not to exceed L/175 of overall panel dimension (width or length).
 - 2. Panel dimensions should have allowance for field adjustments where final dimensions cannot be established by field measurement prior to panel manufacturing. *Check with fabricator for tolerances due to varying conditions.*
- E. PANEL SURFACES: Panel angles shall be sharp and true. Panels shall be visually flat and shall not exhibit any warping or buckling. Panel shall be free of scratches or marks caused during fabrication.

2.3 MATERIAL FINISHES

- A. COLOR / PATTERN SELECTION:
 - 1. Shall be by architect based on manufacturer’s standard color / pattern chart or custom color / pattern availability.



B. FINISH TYPE:

1. PAINT: Fluoro ethylene Vinyl Ether (FEVE), or Polyvinylidene Fluoride (PVDF)
2. ANODIZED – Electrochemical process that converts the metal surface into a decorative, durable, corrosion-resistant, anodic oxide finish.

C. PAINT COATING:

1. FEVE or PVDF - Coil coated KYNAR® 500 based Polyvinylidene Fluoride (PVDF) or Fluoro Ethylene – Alkyl Vinyl Ether (FEVE) resin in conformance with the following general requirements of AAMA 2605.
 2. Color(s): (Select one of the following)
 - a. To be chosen from standard color range
 - b. Custom color to be matched by panel manufacturer and approved by the Architect of Record. *NOTE: Longer lead times will apply.*
 - c. Clear coat over pretreated natural and/or brushed aluminum substrates
 3. Coating: Shall be factory applied on a continuous-process paint line. Coating shall consist of a 0.2 mil (approx.) primer coat and a 0.8 mil (approx.) topcoat containing 70% Kynar® 500 resins. 3 Coat systems shall include also a 0.5 mil (approx.) clear coat containing 70% Kynar® 500 resins.
 4. Gloss: ASTM D523. Standard at 60° shall be 25-35.
 5. Flexibility: ASTM D4145. Shall be 0-2 T-Bend; No pick-off.
 6. Adhesion: ASTM 3359. Reverse impact 1/16" crosshatch shall show no cracking or adhesion loss.
 7. Reverse Impact: ASTM D2794. 1.5 x metal thickness (aluminum) shall show no cracking or adhesion loss.
 8. Exterior Exposure: 10 years at 45°, South Florida. ASTM D2244 shall be Max. 5 fade and ASTM D4214 shall be Max. 8 chalk.
 9. Acid Resistance: ASTM D1308. 10% muriatic acid – 24 hrs. shall show no effect. 20% sulfuric acid – 18 hrs. shall show no effect.
 10. Alkali Resistance: ASTM D1308. 10%, 25% NaOH, 1 hr., shall show no effect.
 11. Salt Spray Resistance: ASTM B117. 5% salt fog at 95°F. Pass 4,000 hrs. Less than 1/16" avg. creep from scribe; none or few #8 blisters.
 12. Humidity Resistance: ASTM D714 and ASTM 2247. 100% relative humidity at 95°F. Shall pass 4,000 hrs. No #8 blisters.
 13. Acid Rain Test: Kesternich SO₂, DIN 50018. 15 cycles minimum. No objectionable color change.
 14. Pencil Hardness: ASTM D3363. F-2H.
- D. ANODIZED - [Nonspecular Course Matt Clear:]
1. Product Performance



- a. Anodize Coating Mass will be in accordance with ASTM B 137. Anodize layer will meet specified requirements of either Architectural Class I or Class II film thickness.
- b. Seal Quality will be in accordance with ASTM B 680. Anodic layer will meet specified requirements.
- 2. Anodize Finish Requirements
 - a. Aluminum Association AA-M12-C23-A41; Class I film thickness shall meet the following requirements:
 - i. Color Uniformity: Not Applicable
 - ii. Gloss: Coarse Matte not to exceed 40 Gloss at 60° as measured in accordance with ASTM B 523; Reference AAMA 611-98
 - iii. Anodic Layer Thickness: 0.7 mils minimum [17.8 µm] as measured and calculated in accordance with ASTM B 137; Reference AAMA 611-98
 - iv. Salt Spray Resistance: Expose anodic layer to 3000 hours, using 5% NaCl solution as tested in accordance with ASTM B-117; Reference AAMA 611-98
 - 3. AA-M12-C23-A31; Nonspecular Course Matt Clear Architectural Class II film thickness shall meet the following requirements:
 - a. Color Uniformity: Not Applicable
 - b. Gloss: Coarse Matte not to exceed 40 Gloss at 60° as measured in accordance with ASTM B 523; Reference AAMA 611-98
 - c. Anodic Layer Thickness: 0.400 mils minimum [10.2 µm] as measured and calculated in accordance with ASTM B 137; Reference AAMA 611-98
 - d. Salt Spray Resistance: Expose anodic layer to 1000 hours, using 5% NaCl solution as tested in accordance with ASTM B-117; Reference AAMA 611-98
- E. Anodized - [Nonspecular Course Matt Electrolytically Deposited Color:]
 - 1. Product Performance
 - a. Anodize Coating Mass. When tested for coating mass, in accordance with ASTM B 137, the anodize layer will meet specified requirements of either Architectural Class I or Class II film thickness.
 - b. Seal Quality. When tested for anodize seal quality, in accordance with ASTM B 680, the anodic layer will meet specified requirements.
 - 2. Anodize Finish Requirements
 - a. AA-M12-C23-A44: Nonspecular Course Matt Electrolytically Deposited Color Architectural Class I film thickness shall meet the following requirements:
 - i. Color Uniformity: ≤ 5 Delta E color change as measured in accordance with ASTM D 2244; Reference AAMA 611-98
 - ii. Gloss: Coarse Matte not to exceed 40 Gloss at 60° as measured in accordance with ASTM B 523; Reference AAMA 611-98



- iii. Anodic Layer Thickness: 0.700 mils minimum [17.8 μm] as measured and calculated in accordance with ASTM B 137; Reference AAMA 611-98
- iv. Salt Spray Resistance: Expose anodic layer to 3000 hours, using 5% NaCl solution as tested in accordance with ASTM B-117; Reference AAMA 611-98
- b. AA-M12-C23-A34; Nonspecular Course Matt Electrolytically Deposited Color Architectural Class II film thickness shall meet the following requirements:
 - a. Color Uniformity: ≤ 5 Delta E color change as measured in accordance with ASTM D 2244; Reference AAMA 611-98
 - b. Gloss: Coarse Matte not to exceed 40 Gloss at 60° as measured in accordance with ASTM B 523; Reference AAMA 611-98
 - c. Anodic Layer Thickness: 0.400 mils minimum [10.2 μm] as measured and calculated in accordance with ASTM B 137; Reference AAMA 611-98
 - d. Salt Spray Resistance: Expose anodic layer to 1000 hours, using 5% NaCl solution as tested in accordance with ASTM B-117; Reference AAMA 611-98
- F. Natural Metals
 - 1. Standard Natural Metals – as specified by architect
 - 2. Custom Developed Natural Metal Finish - MCM manufacturer shall have documented experience in developing highly specialized products and artificially aged continuous coil finishes.
- G. Specifier Notes:
 - 1. Custom color options available. Inquire for price and lead time.
 - 2. Metallic colors require panel grain to follow one direction. This may increase amount of material required based on panel layout from original blanks.
 - 3. For best color uniformity, project shall be supplied from a single coil color production run.

2.4 ACCESSORIES

- A. Provide components from a single supplier including; proprietary aluminum extrusions compatible with panel edges. System is dry set and finished with matching spline material with no exposed fasteners or rivets on panel edges.
- B. Fasteners: All exposed fasteners shall be stainless steel. All hidden fasteners shall be bi-metal, coated with Climaseal or stainless steel.
- C. Flashings shall be aluminum with the same finish in areas where panels and flashings are exposed to the elements.

PART 3 — EXECUTION



3.1 EXAMINATION

- A. Examine work of other Sections upon which work of this Section depends.
- B. Report any unsatisfactory conditions to Architect in writing. Do not begin work until unsatisfactory conditions are corrected.

3.2 PREPARATION

- A. Review and coordinate approved shop drawings and manufacturer's instruction for installation.
- B. For areas where dissimilar metals may be in contact, treat or separate with gaskets, non-absorptive tape or other insulating material recommended by the manufacturer.

3.3 INSTALLATION

- A. Erect panels and joint filler strip in accordance with system manufacturer's recommended details, approved shop drawings and instructions to meet specified design and performance requirements.
- B. Finished work shall be securely anchored, free of distortion and surface imperfections, uniform in color and gloss.
- C. Use concealed fastenings only, except where exposed fastenings are specifically permitted by Architect in writing.
- D. Install wall panels that are plumb, true, level and in alignment to established lines and elevations.
- E. Where indicated on drawings or as required to complete work of this Section, supply and install closures, caps, fascia covers and trims with matching panel finish, where exposed.

3.4 ADJUSTING AND CLEAN-UP

- A. Remove protective film from panels.
- B. Clean exposed panel surfaces in accordance with manufacturer's instructions.
- C. Clean and touch up minor abrasions with an air dried paint supplied by the manufacturer of the wall panels.
- D. Make sure weep holes and drainage channels are unobstructed and free of dirt and any sealants.
- E. Replace damaged panels and components that cannot be satisfactorily repaired. After installation, panel repair and replacement shall become the responsibility of the general contractor.