

SECTION 07420
COMPOSITE ALUMINUM PANELS

PART 1 GENERAL

1.01 SUMMARY

- A. Provide Composite ACM Pressure Equalized Rain Screen Wall Cladding System at Walls, soffits, and window surrounds as detailed, including sealants, Gaskets, fasteners, related flashings.
- B. Related Sections: Section(s) related to this section include:
 - 1. Cold-Formed Metal Framing: Division 5 Metal Framing Sections.
 - 2. Sheet Metal Flashing and Trim: Division 7 Flashing and Trim Section.
 - 3. Joint Sealers: Division 7 Joint Treatment Section.
 - 4. Aluminum Windows: Division 8 Aluminum Windows Section.

1.02 REFERENCES

- A. General: Standards listed by reference, including revisions by issuing authority, form a part of this specification section to the extent indicated. Standards listed are identified by issuing authority, authority abbreviation, designation number, title or other designation established by issuing authority. Standards subsequently referenced herein are referred to by issuing authority abbreviation and standard designation.
- B. ASTM International:
 - 1. ASTM C297 Standard Test Method for Tensile Strength on Flat Sandwich Constructions in Flatwise Plane.(ACM)
 - 2. ASTM D1781 Standard Test Method for Climbing Drum Peel for Adhesives.(ACM)
 - 3. ASTM D1929 Standard Test Method for Determining Ignition Temperature of Plastics.(ACM)
 - 4. ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials.(ACM)
 - 5. ASTM E108 (Modified) Standard Test Methods for Fire Tests of Roof Coverings.(ACM)
 - 6. ASTM E330 Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors By Uniform Static Air Pressure Difference.(PER SYSTEM)
 - 7. ASTM E331 Standard Test Method for Water Penetration of Exterior Windows, Curtain Wall, and Doors By Uniform Static Air Pressure Difference.(PER SYSTEM)
 - 8. ASTM E1233 Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Cyclic Static Air Pressure Differential.(PER SYSTEM)
- C. American Architectural Manufacturers Association (AAMA):
 - 1. AAMA 2605 Specification for High Performance Organic Coatings on Architectural Extrusions and Panels.(ACM)
 - 2. AAMA 501.1 Standard Test Method for Water Penetration of Windows, Curtain Walls and Doors Using Dynamic Pressure.(PER SYSTEM)
 - 3. AAMA 508-05 Voluntary Test Method And Specification For Pressure Equalized Rain Screen Wall Cladding System(PER SYSTEM)
- D. National Evaluation Service, Inc. (NES):
 - 1. Report No. NER-657.
- E. City of Los Angeles, Department of Building and Safety:
 - 1. Research Report No. RR25362.

1.03 SYSTEM DESCRIPTION

- A. Performance Requirements: Provide composite metal panels which have been manufactured, fabricated and installed to withstand loads from deflection and thermal movement and to maintain performance criteria stated by manufacturer without defects, damage or failure. System must be tested in a laboratory setting by a lab accredited to the methods stipulated in AAMA 508-05. Specifically, labs shall be accredited to all of the following:
1. AAMA 501.1-5
 2. ASTM E283-04
 3. ASTM E330-02
 4. ASTM E331-00
 5. ASTM E1233-00
- Proof of accreditation to these test methods shall be submitted upon request.
- B. Water and Air Leakage: Provide systems that have been tested and certified to conform to the following criteria:
1. Air Leakage (ASTM E283): Test to confirm that the air/water barrier leakage is $0.12 \text{ cfm/ft}^2 \pm 10\%$ at 1.57 psf. The test pressure difference shall be positive on the exterior of the air/water barrier and negative on the interior.
 - a. the abaa recommends an air leakage rate of 0.03 cfm/ft^2 at 1.57 psf for air barrier assemblies. This procedure uses a higher air leakage to simulate possible field defects in as-built conditions.
 - b. ASTM E283 test procedure is preformed to simulate air/water leakage of the air/water barrier. A True Pressure Equalized Rainscreen panels system is designed to allow air leakage through the panel system.
 2. Water Penetration Dynamic: In no case shall the volume of water collected exceed 1 oz per 100ft^2 under dynamic pressure when tested in accordance with AAMA 501.1 at a differential of 10% inward acting design load, 6.24 psf minimum after 15 minutes.
 - a. Water penetration is defined as the appearance of uncontrolled water in the wall.
 - b. Wall design shall feature provisions to drain to the exterior face of the wall any leakage of water at the joints and any condensation that may occur within the construction.
 3. Water Penetration Static: In no case shall the volume of water collected exceed 1 oz per 100ft^2 under static pressure when tested in accordance with ASTM E331 at a differential of 10% of inward acting design load, 15 psf minimum, after 15 minutes.
 - a. Water penetration is defined as the appearance of uncontrolled water in the wall.
 - b. Wall design shall feature provisions to drain to the exterior face of the wall any leakage of water at joints and any condensation that may occur within the construction.
- B. Structural: Provide systems that have been tested in accordance with ASTM E330 at a design pressure of [Specify design pressure.] psf ([Specify design pressure.] kPa) and have been certified to be without permanent deformation or failures of structural members.
- C. Pressure Equalization: For the system to be considered pressure equalized, the lag time between the cavity and cyclic wind pressure shall not exceed 0.08 sec^2 . The maximum differential between the cavity and the cyclic wind pressure shall not exceed 50% of the maximum test pressure when tested in accordance with ASTM E1233-00 at positive pressure loading from 5 psf to 25 psf to 5 psf based on a maximum average of three second cycle durations for 100 cycles.

1.04 SUBMITTALS

- A. General: Submit listed submittals in accordance with Conditions of the Contract and Division 1 Submittal Procedures Section.
- B. Product Data: Submit product data, including manufacturer's SPEC-DATA® sheet, for specified products.
- C. Shop Drawings: Submit shop drawings showing layout, profiles and product components, including anchorage, accessories, finish colors and textures.
1. Include details showing thickness and dimensions of the various system parts, fastening and anchoring methods, locations of joints and gaskets, and location and configuration of joints necessary to accommodate thermal movement.
 2. Compartmentalization Plan: Show the principle of dividing the vent and drainage cavity into smaller confined air cavities to control vertical or horizontal air flow inside the wall for the purpose of maintaining the pressure equalized air space.

- D. Samples: Submit selection and verification samples for finishes, colors and textures.
 - 1. Selected Samples: Manufacturer's color charts or chips illustrating full range of colors, finishes and patterns available for composite metal panels with factory-applied finishes.
 - 2. Verification Samples:
 - a. Structural: 12 inch × 12 inch sample composite panels in thickness specified, from an available stock color, including clips, anchors, supports, fasteners, closures and other panel accessories, for assembly approval.
 - b. Include separate sets of draw down samples on aluminum substrate, not less than 3 inches × 5 inches of each color and finish selected, for color approval. Larger samples of standard colors are available with production applied coatings.
- E. Quality Assurance Submittals: Submit the following:
 - 1. Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties.
 - 2. Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and physical requirements.
 - 3. Manufacturer's Instructions: Manufacturer's installation instructions.
- F. Closeout Submittals: Submit the following:
 - 1. Warranty: Warranty documents specified herein.

1.05 QUALITY ASSURANCE

- A. Qualifications:
 - 1. 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.
 - 2. Manufacturer Qualifications: Company with a minimum of 5 years of continuous experience manufacturing panel material of the type specified:
 - a. Able to provide specified warranty on finish.
 - b. Able to provide a list of 5 other projects of similar size, including approximate date of installation and name of Architect for each.
 - c. Able to produce the composite material without outsourcing of the coating or laminating process.
 - 3. Fabricator Qualifications: Company with at least 3 years of experience on similar sized metal panel projects and qualified by panel material manufacturer. Capable of providing field service representation during construction.
- B. Mock-Ups: Install at project site a job mock-up using acceptable products and manufacturer approved installation methods. Obtain Owner's and Architect's acceptance of finish color (draw down samples to be used for color approval of nonstandard coil coated colors), texture and pattern, and workmanship standard. Comply with Division 1 Quality Control (Mock-Up Requirements) Section.
 - 1. Mock-Up Size: [Specify mock-up size.].
 - 2. Maintenance: Maintain mock-up during construction for workmanship comparison; remove and legally dispose of mock-up when no longer required.
 - 3. Incorporation: Mock-up may be incorporated into final construction upon Owner's approval.
- C. Preinstallation Meetings: Conduct preinstallation meeting to verify project requirements, substrate conditions, manufacturer's installation instructions and manufacturer's warranty requirements. Comply with Division 1 Project Management and Coordination (Project Meetings) Section.

1.06 DELIVERY, STORAGE & HANDLING

- A. General: Comply with Division 1 Product Requirements Sections.
- B. Ordering: Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.
- C. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
 - 1. Protection: Protect finish of panels by applying heavy duty removable plastic film during production.
 - 2. Delivery: Package composite wall panels for protection against transportation damage. Provide markings to identify components consistently with drawings.
 - 3. Handling: Exercise care in unloading, storing and installing panels to prevent bending, warping, twisting and surface

damage.

- D. Storage and Protection: Store materials protected from exposure to harmful weather conditions and at temperature conditions recommended by manufacturer.
 - 1. Storage: Store panels in well-ventilated space out of direct sunlight.
 - a. Protect panels from moisture and condensation with tarpaulins or other suitable weathertight covering installed to provide ventilation.
 - b. Slope panels to ensure positive drainage of any accumulated water.
 - c. Do not store panels in any enclosed space where ambient temperature can exceed 120 degrees F(49 degrees C).
 - 2. Damage: Avoid contact with any other materials that might cause staining, denting or other surface damage.

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.

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.
 - 1. Warranty Period:
 - a. Panel Integrity: 10 years commencing on Date of Substantial Completion.
 - b. Finish: 20 years. commencing on Date of Substantial Completion.

PART 2 PRODUCTS

2.01 PRESSURE EQUALIZED RAIN SCREEN WALL CLADDING SYSTEM

- A. Skyline Sheet Metal, Inc. System: SSMPER
 - 1. Contact: 1535 NW Sundial Rd, Troutdale, OR 97060; Telephone: (503)669-1156; Fax: (503) 666-8189; E-mail: jpeters@skylinesheetmetal.com; website: www.skylinesheetmetal.com.
- B. Manufactured in the USA
 - 1. All components of the SSMPER are assembled in Troutdale, OR
 - 2. Santoprene Thermoplastic Gasket Manufactured with 20% recycled content in Beaverton, OR
 - 3. 6063 T5 Aluminum Extrusions manufactured with 20% recycled content in Portland, OR

2.02 COMPOSITE ACM PANELS

- A. Manufacturer: Mitsubishi Chemical FP Corporation.
 - 1. Contact: 401 Volvo Parkway, Chesapeake, VA 23320; Telephone: (800) 422-7270; Fax: (757) 436-1896; E-mail: info@alpolic.com; website: www.alpolic-usa.com.
- B. Proprietary Product: ALPOLIC Composite Metal Panels, including:
 - 1. ALPOLIC/ACM composite metal panels.

2.03 PRODUCT SUBSTITUTIONS

- A. Substitutions: Refer to section 01200 for possible effect upon work of this Section.

2.04 COMPOSITE METAL PANEL MATERIALS

- A. ALPOLIC/ACM Composite Metal Panels:
 - 1. Panel Thickness: 4 mm.
 - 2. Core: Thermoplastic core material with inorganic fillers that meets performance characteristics specified when fabricated into composite assembly.
 - 3. Face Sheets: Aluminum alloy 3105 H14, 0.020 inch (0.51 mm) thick, and as follows:
 - a. Coil coated with a fluoropolymer paint finish that meets or exceeds values expressed in AAMA 2605 where relevant to coil coatings.
 - b. Spray coated with specified finish (quantities less than 7500 ft² (700 m²)).
 - 4. Bond Integrity: Tested for resistance to delamination as follows:

- a. Bond Strength (ASTM C297): 427 psi (2.9 MPa) minimum.
- b. Peel Strength (ASTM D1781): 27.6 in-lb/in (123 N-m/m) minimum.
- c. No degradation in bond performance after 8 hours of submersion in boiling water and after 21 days of immersion in water at 70 degrees F (21 degrees C).
- d. Thermally bonded in a continuous process, under tension, to the core material.

5. Fire Performance:

- a. Flamespread (ASTM E84): 0.
- b. Smoke Developed (ASTM E84): 0
- c. Surface Flammability (Modified ASTM E108): Pass.
- d. Ignition Temperature: Flash (ASTM D1929): 716 degrees F (433 degrees C), Ignition: 752 degrees F (447 degrees C).
- e. UBC 26-9 Intermediate Scale Multi-Story Apparatus Test: Passed.

B. Production Tolerances:

1. Width: +/- 0.04 inch/3 feet (1 mm/m).
2. Length: +/- 0.04 inch/3 feet (1 mm/m).
3. Thickness (4 mm Panel): +/- 0.008 inch (0.2 mm).
4. Thickness (6 mm Panel): +/- 0.012 inch (0.3 mm).
5. Bow: Maximum 0.5% length or width.
6. Squareness: Maximum 0.2 inch (5.1 mm).
7. Edges of sheets shall be square and trimmed with no displacement of aluminum sheets or protrusion of core material.

2.05 ACCESSORIES

- A. General: Provide Skyline Sheet Metal's standard accessories, including fasteners, clips, Gaskets, anchorage devices and attachments specific to SSMPER Pressure Equalized Rain Screen Wall Cladding System.

2.06 STIFFENERS

- A. Extruded aluminum provided behind panels to maintain specified panel flatness

2.07 JOINT SEALANTS AND GASKET

- A. Continuous Santoprene Thermoplastic Rubber Gasket locked into the perimeter of all panels. Joint Spine to be 6063T5 Aluminum Extrusion painted to match panel finish with Kynar 500 or Hylar 5000 with 70% minimum Fluorine content

2.08 RELATED MATERIALS

- A. General: Refer to other related sections in Related Sections paragraph specified herein for related materials, including cold-form metal framing, flashing and trim, joint sealers, aluminum windows, glass and glazing, and curtain walls.

2.09 FABRICATION

- A. General: Shop fabricate to sizes and joint configurations indicated on the drawings.
1. Where final dimensions cannot be established by field measurements, provide allowance for field adjustment as recommended by the fabricator.
 2. Form panel lines, breaks and angles to be sharp and true, with surfaces that are free from warp or buckle.
 3. Fabricate with sharply cut edges, with no displacement of aluminum sheet or protrusion of core.

2.010 FINISHES

- A. Factory Finish: Lumiflon-based fluoropolymer resin coating that meets or exceeds values expressed in AAMA 2605 where relevant to coil coatings.
1. Color: Standard Color

2.011 SOURCE QUALITY

- A. Source Quality: Obtain composite panel products from a single manufacturer.

PART 3 EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

- A. Compliance: Comply with manufacturer's product data, including product technical bulletins, product catalog installation instructions and product carton instructions.

3.02 EXAMINATION

- A. Site Verification of Conditions: Verify that substrate conditions, which have been previously installed under other sections, are acceptable for product installation.

3.03 INSTALLATION

- A. General:
 - 1. Install panels plumb, level and true, in compliance with fabricator's recommendations.
 - 2. Anchor panels securely in place, in accordance with fabricator's approved shop drawings.
 - 3. Comply with fabricator's instructions for installation of concealed fasteners
 - 4. Installation Tolerances: Maximum deviation from horizontal and vertical alignment of installed panels: 0.25 inch in 20 feet
- B. Related Products Installation Requirements: Refer to other sections in Related Sections paragraph herein for installation of related products.

3.04 FIELD QUALITY REQUIREMENTS

- A. Field Quality Control: Comply with panel system fabricator's recommendations and guidelines for field forming of panels.
- B. Fabricator's Field Services: Upon Owner's request, provide fabricator's field service consisting of product use recommendations and periodic site visit for inspection of product installation in accordance with fabricator's instructions.
 - 1. Site Visits: Duration of project

3.05 ADJUSTING

- A. Adjusting:
 - 1. Repair panels with minor damage such that repairs are not discernible at a distance of 10 feet (3 m).
 - 2. Remove and replace panels damaged beyond repair.
 - 3. Remove protective film immediately after installation of joint sealers and immediately prior to completion of composite metal panel work.
 - 4. Remove from project site damaged panels, protective film and other debris attributable to work of this section.

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's finish surfaces from damage during construction.
 - 1. Institute protective measures as required to ensure that installed panels will not be damaged.

END OF SECTION