

ARMETCO SYSTEMS

RSX4 ALUMINUM COMPOSITE RAIN SCREEN PANEL SYSTEM

TECHNICAL MANUAL



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...systems that work from a company you can work with...

OUR COMPANY

Established in 1986, Armetco Systems is a leading fabricator of metal panel cladding systems and custom sun control systems.

We offer a variety of systems and materials that will enhance the appearance and performance of your project.

Armetco management brings over 20 years experience in design, fabrication, and installation of architectural metal cladding systems to your project team. From sales to engineering to plant management, we understand and appreciate the challenges you and your contractors face.

Every project is shipped complete with detailed shop drawings, installation instructions, detailed panel and material list, approved fabrication tickets, and clearly marked crates and panels.

PRODUCTS

Aluminum Composite Cladding Systems
Metal Plate Cladding Systems
Sun Controls

PRODUCT APPLICATIONS

Wall cladding
Soffits and Fascia Cladding
Ceilings
Canopies
Entry Vestibules
Building and Elevator Lobbies
Column covers
Beam Cladding
Equipment Screening
Roof Screens
Architectural Accents
Sun Control and Shading

RSX4 DESIGN INFORMATION

Dry Joint Rainscreen System (no field sealing of panel joints).

Continuous aluminum extrusion attachment system eliminates sub-framing.

Meets ASTM and AAMA standards for water & air infiltration and wind loads.

4mm Aluminum Composite Material

System Depth = 1.75"

Panel Joint Width = 1/2"

Maximum Panel Height = 60"

Minimum Panel Height = 12"

Maximum Panel Length = 238"

Minimum Panel Length = 12"

RSX4 - Aluminum Composite Rain Screen Panel System

GENERAL INFORMATION

The information in this manual has been prepared to assist the designer and installer with the proper application of Armetco's RSX4 Rout and Return Dry Joint Rainscreen System. Since each project is unique, the information is intended to be used as a guideline and in no way ensures proper application of Rout and Return Dry Joint Rainscreen System panels.

ALUMINUM COMPOSITE MATERIAL

Aluminum Composite Material (ACM) is the material of choice when panel flatness and a high performance finish are a must. Made from two sheets of aluminum bonded to a thermoplastic core, ACM is strong yet lightweight and with the right product knowledge and equipment can be fabricated into panel systems that will accommodate your cladding needs.

Armetco Systems offers a complete line of ACM products, systems and services. With multiple attachment systems and access to all of the major Aluminum Composite Material manufacturers, Armetco has an ACM solution for all applications.

Armetco Systems introduces RSX4, our new ACM Rainscreen Cladding System. RSX4 cladding provides the "outer leaf" of the rainscreen system and is designed for application over "inner leaf" wall construction that includes proper framing, sheathing, insulation and a suitable waterproofing membrane.

RSX4 utilizes a perimeter extrusion attachment system that combines the drained back ventilated rainscreen design with an integral equalization chamber that allows airflow through the back of the cladding while shedding and expelling 99% of water, providing an outer leaf that virtually eliminates water penetration on its own.

RSX4 has been tested and passes the AAMA 508 water infiltration resistance test for rainscreen systems and ASTM E-330 tests for structural loading.

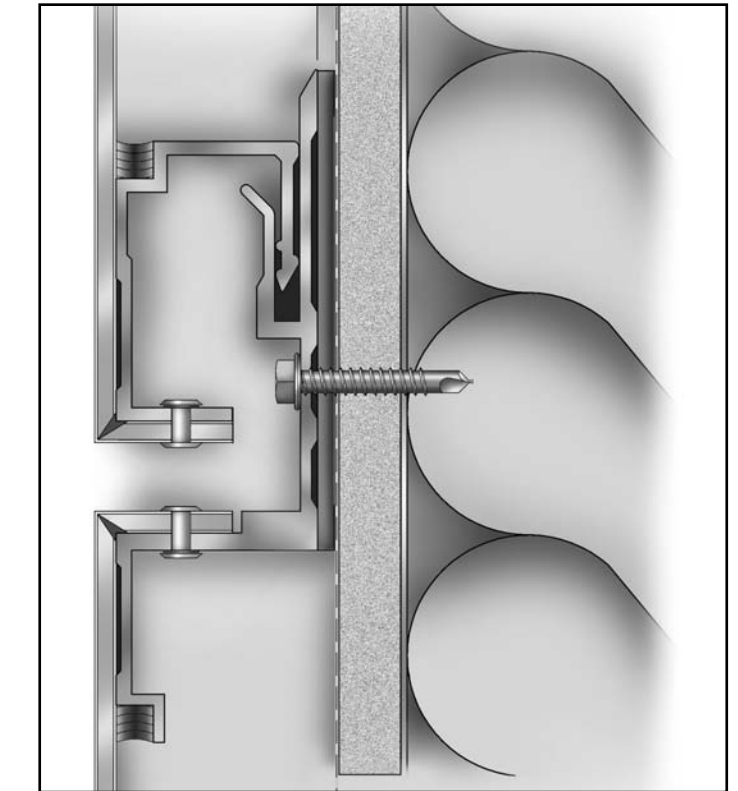
RSX4's design offers a clean rout and return open joint look with virtually non visible internal extrusions. The design minimizes extrusion processing and finishing keeping RSX4 competitively priced while offering high performance and reduced lead times.

Every project is shipped complete with installation drawings, installation instructions, detailed material lists, approved fabrication tickets, and clearly marked crates and panels.

PROPER STORAGE

If panels are not to be used immediately, they should be stored in an area that is out of the way and suitable for storage until ready for installation. Continual moving of crates and / or panels will cause damage to panels. Panels intended for exterior use can be stored outside. Store crates on a solid surface. Keep the material off the ground and Do NOT store crates on surfaces that are subject to mud or in drainage areas where water can reach panels. If crates are wrapped in plastic, cut several large slits on the sides to allow ventilation and reduce condensation. It is the responsibility of the contractor / panel erector to insure that panels are properly stored at the jobsite.

SECTION OF RSX4 ALUMINUM COMPOSITE RAIN SCREEN PANEL SYSTEM



PROPER UNLOADING & HANDLING

1. Inspect crates immediately for damage. Notify driver of any visible damage and record damage on driver's copy of shipping bill.
2. Inspect contents of crates within 24 hours of delivery
3. Panel crates must be lifted from the bottom skid.
4. For hoisting, use proper lifting straps that have been inspected and are in good condition. DO NOT USE CABLE OR ROPE.
5. Place panels in area that they can be stored safely until ready for installation. Do not move crates and / or panels any more than absolutely necessary. This will cause damage to panels.
6. Handle panels with multiple faces by lifting and / or supporting panel's at all or at least two faces. Failure to do this can cause damage to corner clips and supports and may cause the face sheet to split.

INSTALLATION

1. If field verification of dimensions is required, record actual field dimensions on 1 set of shop drawings and return to Armetco engineering.
2. Review and approve Armetco fabrication drawings as required.
3. Check support framing to be sure area to receive panels is installed straight, plumb and in plane.
4. Inspect waterproofing membrane for proper installation and for rips or tears. If waterproofing membrane is not installed properly and in good condition, make necessary repairs or notify contractor immediately. DO NOT PROCEED with panel installation until waterproofing membrane is in acceptable condition.

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
- Aluminum composite building panels indicated on the project drawings and as specified herein.
 - Supplementary subgirts, clips, anchoring devices, fasteners, and accessories.
- B. Related Documents: General and Supplementary Conditions of the Contract, Division 1 General Requirements, and Drawings are applicable to this Section.

1.2 SYSTEM DESCRIPTION

- A. System Requirements
- Rout and Return, dry joint rainscreen: Aluminum Composite Panel system utilizing continuous perimeter aluminum extrusion attachment system that combines the drained back ventilated rainscreen design with an integral pressure equalization chamber to allow airflow through the back of the cladding while shedding and expelling water. Panel joints shall be 1/2 inch wide. No field sealant at typical panel intersections allowed.
 - Basis of Design: Armetco Systems RSX4 Rout & Return Rainscreen System: Provide complete panel system as manufactured by ARMETCO SYSTEMS, INC., 11647 Armetco Drive, Justin, TX PH 800-647-3778 or other manufacturers whose materials offer the same function, performance, and have received prior approval by the Architect. Approval shall be based upon documentation showing the adequacy and engineering properties of the material.
- B. Design Requirements:
- Fabricator shall provide system design including anchorage to structural system and modifications that are necessary to meet specified requirements and maintain visual design concepts.
 - Drawings and specifications are an outline of criteria and performance requirements for the System. Requirements specified or indicated by details are intended to establish basic dimensions of module and sight lines and profiles of members. Include modifications or additions required to meet specified requirements and maintain the visual design concept.
 - Contract Documents do not necessarily indicate or describe total work required for completion of Work. Furnish and install all items required for complete installation.
 - Dimension and profile adjustments may be made in proposed design in interest of fabrication or erection methods or techniques, weatherability factor, or ability of design to satisfy design and performance requirements provided that design intent and intent of Contract Documents are maintained.
 - No visible fasteners, telegraphing or fastening on the panel faces or any other compromise of a neat and flat appearance is allowed.
 - Dry Joint: No exposed sealant at typical panel joints or panel intersections will be allowed.
 - Attachment Considerations: Account for site peculiarities and contraction movements so there is no possibility of loosening, weakening, or fracturing connections.

1.3 PERFORMANCE REQUIREMENTS

- A. This is a performance specification; panel systems that are not in compliance with the required performance standards listed herein are unacceptable.
- B. Provide a composite building panel system, which has been pretested, by a qualified independent Professional Engineer to provide specified resistance to air and water infiltration and structural deflection, when installed. Systems that are not pretested and certified by an independent laboratory prior to bid are unacceptable. The use of a panel manufacturer's generic tests reports is unacceptable; the tests must be for the specific system submitted by the panel system engineer and fabricator.
- C. Structural Performance
- Panels shall be designed to withstand the Design Wind Load based upon the local building code, but in no case less than 20 lb/ft² and 30 lb/ft² on parapet and corner panels. Wind load testing shall be conducted in accordance with ASTM E 330 to obtain the following results.
 - Normal to the plane of the wall between supports, deflection of the secured perimeter-framing members shall not exceed L/175 or 1/4" (19mm), whichever is less.
 - Normal to the plane of the wall, the maximum panel deflection shall not exceed L/60 of the full span.
 - Maximum anchor deflection shall not exceed 1/16" (1.6mm).
 - At 1-1/2 times design pressure, permanent deflections of framing members shall not exceed L/100 of span length and components shall not experience failure of gross permanent distortion. At connection points of framing members to anchors, permanent set shall not exceed 1/16" (1.6mm).
- D. Static Water Infiltration:
- Design system in accordance with AAMA 508-05 test for pressure equalized rain screen wall cladding systems.
 - Water leakage is defined as any uncontrolled water that appears on any normally exposed interior surface, that is not contained or drained back to the exterior, or that can cause damage to adjacent materials or finishes. Water contained within drained flashings, gutters, and sills is not considered water leakage. The collection of up to one half ounce of water (14.8 cc) in a 15 minute test period on top of an interior stop or stool integral with the wall system shall not be considered water leakage.
- E. Items Specifically Prohibited:
- Exposed fasteners.
 - External flashing at corners.
 - Panel to panel joint with exposed silicone.

1.4 SUBMITTALS

- A. Submit in accordance with Section _____.
- B. Submit samples of typical aluminum composite panels, of type, thickness and finish specified.
- C. Product Data: Submit panel manufacturer's product data, consisting of complete product description and specification.
- D. Shop Drawings: Show fabrication and installation layouts of Aluminum Composite Panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.
- E. Product Test Reports: Indicate compliance of Aluminum Composite Panel assemblies and materials with performance and other requirements based on comprehensive testing of current products.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications:
- Products covered under this Section shall be produced by a single manufacturer unless otherwise specified.
 - Manufacturer shall submit evidence of having not less than 10 years successful production of this product.
- B. Fabricator Qualifications:
- Panel System Fabricator shall submit evidence of skill and not less than 5 years specialized experience with this product.
 - Panel System Fabricator shall be approved by the manufacturer.
- C. Installer Qualifications:
- Engage an experienced installer who has completed metal wall panel projects similar in material, design, and extent to that indicated for this project and with a record of successful in-service performance.
 - The panel system installer shall be responsible for a complete, sealed, and weather tight installation.
- D. The panel system fabricator will prepare the shop drawings in accordance with their standard published product data and criteria established by others. The general contractor and subcontractor shall be responsible to verify the information contained therein including all dimensions. In the interest of maintaining job schedules, the panel system fabricator will fabricate all of the materials from the approved set of shop drawings. If field verification of dimensions is required the general contractor/subcontractor shall be responsible to supply these dimensions to the panel system fabricator prior to engineering/fabricating of the materials. Discrepancies found during field verification shall be corrected by the general contractor at no cost to the panel system fabricator.
- E. System: Submit engineer's test reports certifying that fabricated panel system meets performance requirements specified.
- F. Professional Engineer Qualifications: A professional engineer who is legally qualified and experienced in providing engineering services of the kind indicated.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver metal wall panels, and other manufactured items so as not to be damaged or deformed. Package metal wall panels for protection during transportation and handling.
- B. Unload, store, and erect metal wall panels in a manner to prevent bending, warping, twisting, and surface damage in accordance with manufacturer's recommendations.
- C. Store composite wall panels vertically, covered with suitable weathertight and ventilated covering. Store panels to ensure dryness, with positive slope for drainage of water. Do not store panels in contact with other materials that might cause staining, denting, or other surface damage. Do not allow storage space to exceed 120 deg F.
- D. Protect strippable protective covering on metal wall panels from exposure to sunlight and high humidity, except to extent necessary for period of metal wall panel installation.

1.7 WARRANTY

- A. Refer to and conform to requirements in Section _____.
- B. Factory Finish: Provide manufacturer's 10 year warranty stating finish will be:
- Free of fading of color change in excess of 5 NBS units as measured per ASTM D 2244.

- Will not chalk in excess of maximum 8 units change when measured in accordance with ASTM A 214.

1.8 PROJECT CONDITIONS

- A. Field Measurements: Verify location of structural members and openings in substrates by field measurements before fabrication and indicate measurements on Fabrication Approval Drawings.
- B. Established Dimensions: Where field measurements cannot be made without delaying the Work, either establish opening dimensions and proceed with fabricating wall panels without field measurements. Coordinate wall construction to ensure actual locations of structural members and to ensure opening dimensions correspond to established dimensions.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. A specific product or material manufactured by any of the following listed manufacturers is acceptable only if the specific product or material can evidence compliance with requirements of the Contract Documents.
- Reynobond by Alcoa Cladding Systems
 - Alucobond by Alcan Composites USA
 - Alpolic by Mitsubishi Chemical America Inc.
- B. Composite Panel System Fabricator: Armetco Systems Inc. 11647 Armetco Drive, Justin, Texas 76247. Tel (800)-647-3778, Fax (800)-618-7544 www.armetco.com. Basis of design for performance and appearance.
- C. Substitutions: Submit in accordance with Section _____.

2.2 MATERIALS

- A. Composite Panel:
- Two sheets of aluminum sandwiching a core of extruded thermoplastic material formed in continuous process with no glues or adhesives between dissimilar materials.
 - Products laminated sheet by sheet or in batch process using glues or adhesives between materials shall not be acceptable.
 - Aluminum faced panel with thermoplastic core.
 - Panel Thickness: 4 mm (0.157 inch) – Composite Panel.
 - Aluminum Face and Backer Sheet: Minimum 0.020 inches thick.
 - Aluminum Alloy: AA 30036 with coated finish.
- B. Product Performance Requirements
- Tolerances:
- Panel Bow: Maximum 0.8 percent of panel dimension in width and length.
 - Panel Dimensions: Allowance for field adjustments, as recommended by manufacturer, where final dimensions cannot be established by field measurement before completion of panel manufacturing.
 - Panel lines, breaks and angles shall be sharp, true and surfaces free from warp or buckle.
 - Bond Integrity: Per ASTM D 1781, no adhesive failure of bond between core and skin nor cohesive failure within core below the following values:
 - Bond Strength: 214 psi, vertical pull.
 - Peel Strength:
 - 22.5 in pound/inch as manufactured.
 - 22.5 in pound/inch after 8 hours in water

at 200 degrees F.

3) 22.5 in pound/inch after 21 days soaking in water at 70 degree F.

5. Tolerances:

- a. Panel Bow: 0.8 percent maximum of panel dimension in width and length for 72 inch panel.
- b. Maximum Deviation from Panel Flatness: 1/8 inch in 5 feet on panel in each direction for assembled units, non-cumulative.

6. Fire Performance

- a. Flame Spread: 0 per ASTM E 84.
- b. Smoke Developed: 0 per ASTM E84.
- c. Surface Flaming: None per ASTM E 162.
- d. No flame spread along interior face or penetration through wall assembly per UBC 17-5.

2.3 ACCESSORIES

- A. Extrusions, formed members, sheet, and plate, shall conform with ASTM B 209 and the recommendations of the manufacturer.
- B. Composite Panel Stiffener:
 - 1. Aluminum extrusion or galvanized channel as indicated on Drawings.
 - 2. Minimum Spacing: 1/20 square feet of panel area.
 - 3. Panels in excess of 19.99 square feet: Stiffeners required.
 - 4. Calculate additional stiffeners at high wind load areas.
 - 5. Attach with structural tape or silicone.
- C. Sealants and Gaskets: Within panel system, as recommended by panel manufacturer to meet performance requirements.
- D. Flashing Materials: Fabricate from 0.030 inch minimum thickness aluminum sheet painted to match the adjacent panel system where exposed. Provide a lap strap under the flashing at abutted conditions and seal lapped surfaces with a full bed of non-hardening sealant.
- E. Fasteners: Concealed; non-corrosive; as recommended by panel manufacturer and installer. Do not use exposed fasteners.

2.4 FINISHES

- A. General: Comply with NAAMM "Metal Finishes Manual" for recommendations relative to application and designations of finishes.
- B. High-Performance Organic Finish: AA-C12C42R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: acid-chromate-fluoride-phosphate conversion coating; Organic Coating: as specified below). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - 1. Fluoropolymer Two-Coat System: Manufacturer's standard two-coat, thermocured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight, complying with AAMA 620.

- 2. Fluoropolymer Three-Coat System: Manufacturer's standard three-coat, thermocured system consisting of specially formulated inhibitive primer, fluoropolymer color coat, and clear fluoropolymer topcoat, with both color coat and clear topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight, with a minimum total dry film thickness of 1.5 mil; complying with AAMA 620.

3. Color and Gloss: As selected from manufacturer's standard colors.

C. Anodized:

Clear Coating: AA-M12C22A41, Architectural Class I
Color Coating: AA-M12C22A41, light bronze, medium bronze and black, Architectural Class I

D. Polyester

a. Fluoropolymer and acrylic resin; baked paint system, factory applied, baked-on polyester or acrylic resin based paint coating system which meets performance specification AAMA 2603.

PART 3 EXECUTION

3.1 INSPECTION

- A. A rainscreen cladding system consists of an outer leaf (metal cladding) and an inner leaf (framing, insulation, sheathing, and waterproof membrane). The inner leaf is the critical component in keeping the building dry. The installer shall carefully inspect the waterproofing membrane to insure that it is installed per the manufacturer's recommendations and that there are no exposed tears, cuts or holes or other imperfections in the membrane.
- B. Surfaces to receive panels shall be even, smooth, sound, clean, dry and free from defects detrimental to work. The installer shall notify contractor and fabricator in writing of conditions detrimental to proper completion of the work. Do not proceed with erection until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Erect panel plumb, level, and true.
- B. Attachment system shall allow for the free and noiseless vertical and horizontal thermal movement due to expansion and contraction for a material temperature range of -20oF to +180 oF (-29 oC to +82 oC). Buckling of panels, opening of joints, undue stress on fasteners, failure of sealants or any other detrimental effects due to thermal movement will not be permitted. Fabrication, assembly, and erection procedure shall account for the ambient temperature at the time of the respective operation.
- C. Panels shall be erected in accordance with an approved set of shop drawings.
- D. Anchor panels securely per engineering recommendations and in accordance with approved shop drawings to allow for necessary thermal movement and structural support.
- E. Conform to panel fabricator's instructions for installation of concealed fasteners.
- F. Do not install component parts that are observed to be defective, including warped, bowed, dented, abraded, and broken members.

- G. Do not cut, trim, trim weld, or braze component parts during erection in a manner which would damage the finish, decrease strength, or result in visual imperlure in performance. Return component parts which require alteration to shop for fabrication, if possible, or for replacement with new parts.
- H. Separate dissimilar metals and use gasketed fasteners where needed to eliminate the possibility of corrosive or electrolytic action between metals.

3.3 ADJUSTING AND CLEANING

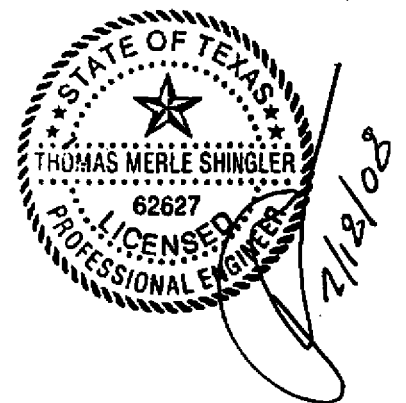
- A. Remove and replace panels damaged beyond repair as a direct result of the panel installation. After installation, panel repair and replacement shall become the responsibility of the General Contractor.
- B. Repair panels with minor damage.
- C. Remove masking (if used) as soon as possible after installation. Masking intentionally left in place after panel installation on an elevation, shall become the responsibility of the General Contractor.
- D. Any additional protection, after installation, shall be the responsibility of the General Contractor.

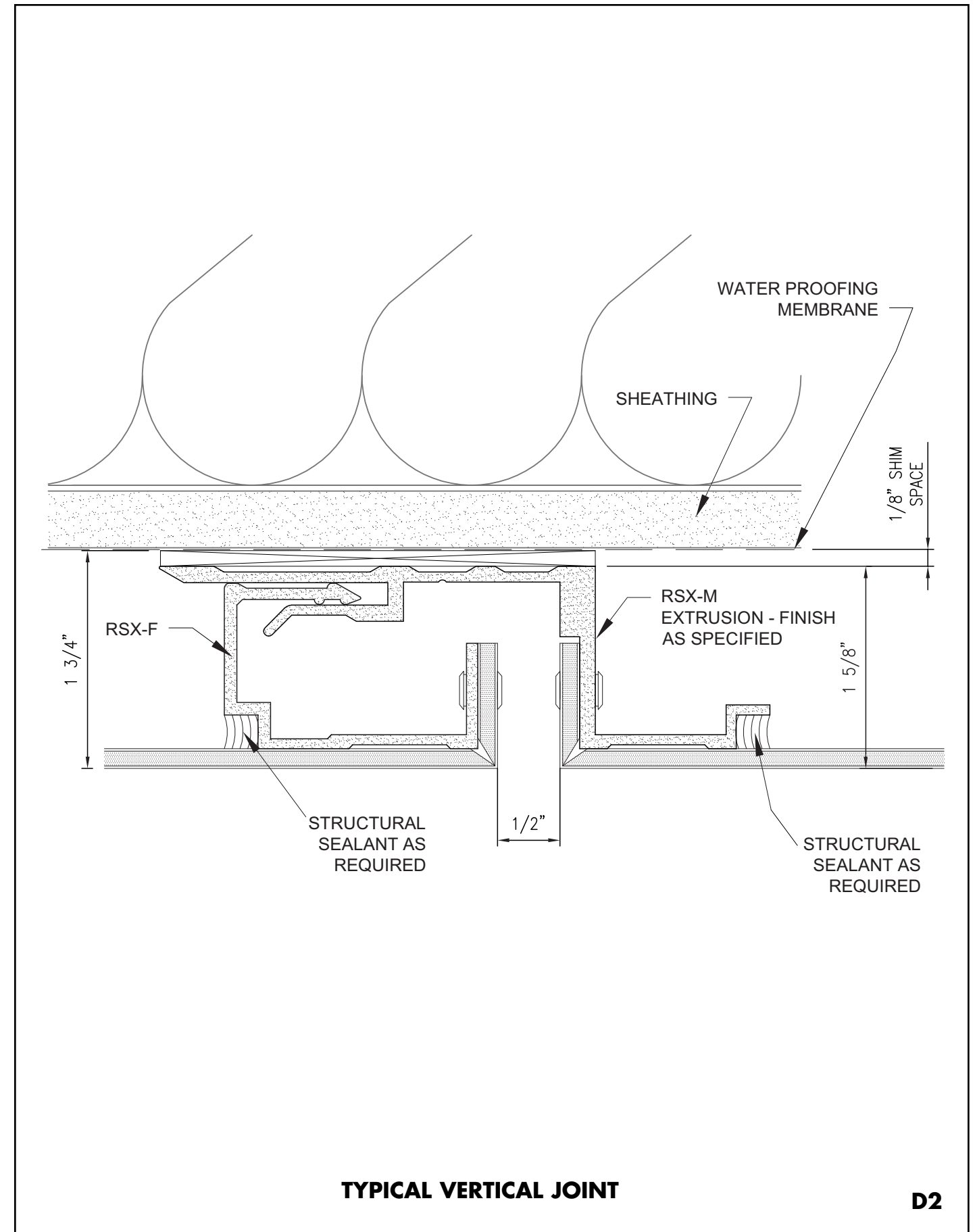
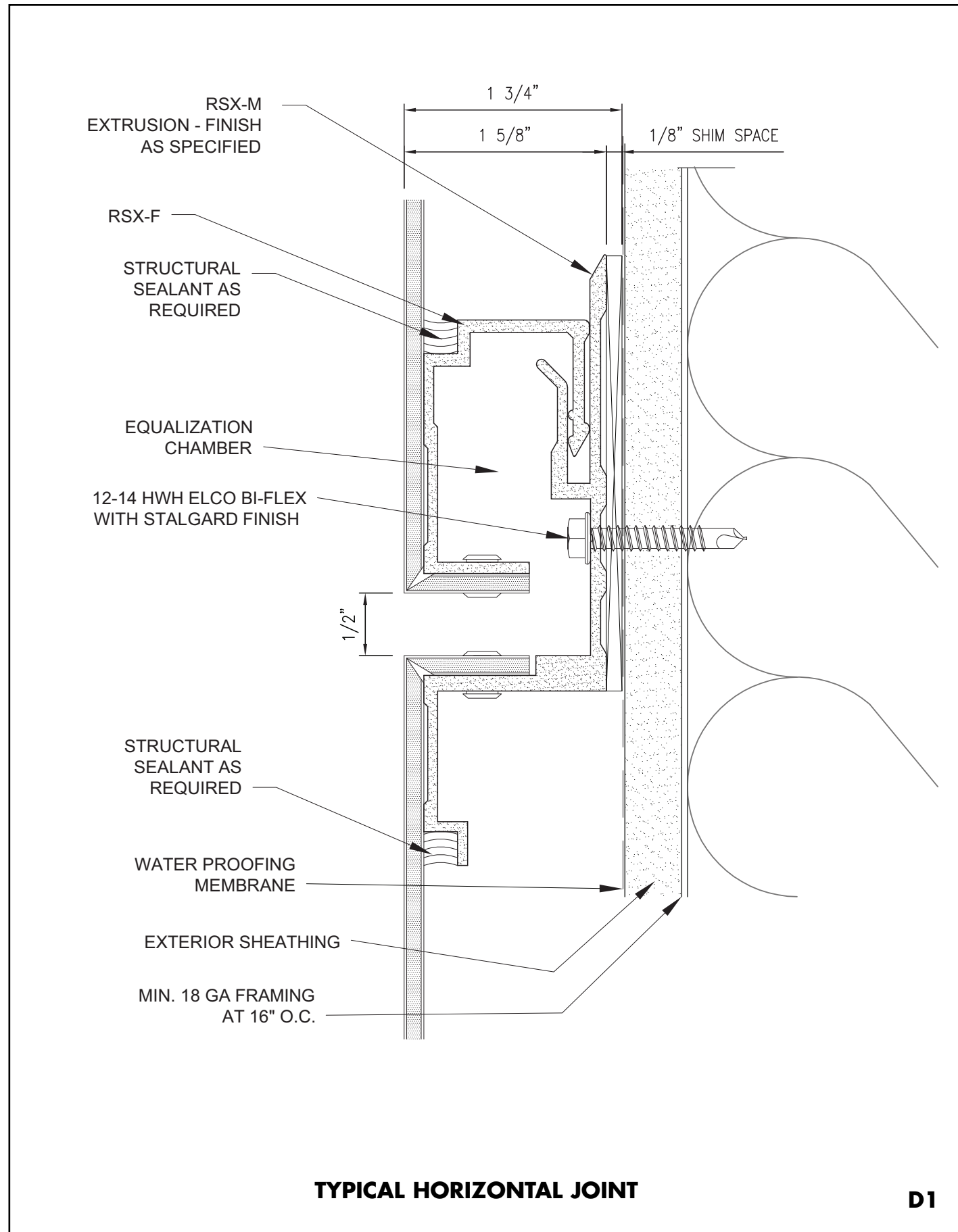
END OF SECTION

TEST RESULTS

WATER INFILTRATION RESISTANCE PORTION OF AAMA 508-05			
ARTMETCO Systems, Inc. RSX4 4mm Aluminum Composite Rout & Return Rainscreen Wall Panel System.			
TEST RESULTS			
Chamber Internal Negative Pressure	Panel Void Positive Pressure	Elapsed Test Time Minutes	Observations from Inside the Test Chamber
1.20 in. H2O (-) 6.24 psf	1.20 in. H2O (+) 6.24 psf	15	No observed leaks at verticle joint
2.40 in. H2O (-) 12.48 psf	2.40 in. H2O (+) 12.48 psf	15	No observed leaks at horizontal joints
3.85 in. H2O (-) 20.00 psf	3.85 in. H2O (+) 20.00 psf	15	No uncontrolled joint leakage at junctions

The ARMETCO RSX4 Aluminum Composite Rout & Return Rainscreen Panel System demonstrated the "rainscreen principle" and successfully passed the Water Infiltration Resistance portion of AAMA 508-05 at (-) 6.24 psf, (-) 12.48 psf and (-) 20.00 psf test chamber pressure levels for a time period of 15 minutes at each of the pressure levels with a constant water deposition rate of 5 gallons per hour per square foot of projected wall area.





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