# VITRABOND Metal Composite Material Façade System Specification Template

**SECTION 074213.17 – ENGINEERED METAL PLATE UTILIZING VITRABOND G2 MATERIAL IN CONJUNCTION WITH ARROWHEAD MOUNTING HARDWARE**

## PART 1 – GENERAL

### 1.01 Summary

A. Provide engineered metal wall panel system including, engineered metal plate (EMP) panels and support system mounting hardware, where shown on the Drawings, as specified, and as needed for a complete and proper installation.

### 1.02 RELATED SECTIONS

1. Section 01 00 00 of these specifications
2. Section 05 10 00 – Structural Metal Framing
3. Section 05 40 00 – Cold Formed Metal Framing
4. Section 07 62 00 – Sheet Metal Flashing & Trim
5. Section 07 92 00 – Joint Sealants
6. Section 08 50 00 – Windows
7. Section 08 44 00 – Glazed Curtain Wall

(Specifier Note: Add or Remove sections as needed for your project conditions)

### 1.03 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. American Society for Testing and Materials

1. B 117 Operating Salt Spray (Fog) Apparatus
2. D 523 Standard Test Method for Specular Gloss
3. D 714 Evaluating Degree of Blistering of Paints
4. D 1308 Effect of Household Chemicals on Clear and Pigmented Organic Finishes
5. D 1781 Climbing Drum Peel Test for Adhesives
6. D 2244 Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates
7. D 2247 Practice for Testing Water Resistance of Coatings in 100% Relative Humidity
8. D 2794 Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)
9. D 3359 Methods for Measuring Adhesion by Tape Test
10. D 3363 Method for Film Hardness by Pencil Test

11. D 4214 Evaluating the Degree of Chalking of Exterior Paint Films
12. D 4145 Standard Test Method for Coating Flexibility of Pre-Painted Sheet
13. E 84 Surface Burning Characteristics of Building Materials
14. E 119 Fire Tests of Building Construction and Materials
15. E 136 Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C

**1.04 SYSTEM DESCRIPTION**

A. System Type:
   1) Provide an open joint rout and return Pressure-equalized Rain Screen Wall Cladding (PRWC) system which has been tested to meet American Architectural Manufacturers Association **AAMA 508-07 "Voluntary Test Method and Specification for Pressure Equalized Rain Screen Wall Cladding Systems"**.
   2) Provide a Drained & Back Ventilated Rain Screen Wall Cladding (D&BVWC) system which has been tested to meet American Architectural Manufacturers Association **AAMA 509-09 "Voluntary Test Method and Specification for Drained & Back Ventilated Rain Screen Wall Cladding Systems"**.
   (Specifier Note: Add or Remove system type as needed for your project conditions)

B. Performance Requirements:
Provide engineered aluminum plates, which have been manufactured, fabricated and installed to withstand loads from deflection & thermal movement and to maintain performance criteria stated by manufacturer without defects, damage, or failure.

C. Deflection & Thermal Movements:
   1) Normal Deflection: Provide exterior/interior wall cladding assemblies capable of withstanding the effects of load stresses from dead loads, wind loads, snow loads and normal thermal movement without evidence of permanent defects of assemblies or components.
      a. Dead Load: As required by applicable building code and AHJ.
      b. Wind Load: As required by applicable building code and AHJ.
   2) Anchor Deflection at connection points of framing members to anchors. Anchor deflection in any direction not to exceed 1/16" (1.6mm).
   3) Thermal Movements: Allow for free horizontal and vertical movement, due to expansion & contraction of components.
      a. Buckling, opening of joints, undue stress on fasteners, failures of sealant, or any other detrimental effects of thermal movement will not be permitted.
      b. Fabrication, assembly, and erection procedures shall take into account the ambient temperature at the time of the respective operation.

**1.05 SUBMITTALS**

A. Contractor shall approve shop drawings prior to submittal

B. Product Data – Engineered Metal panel:
   1. Manufacturer's Technical Data showing physical and performance characteristics.

2. Submit a sample panel in each selected color to Architect for approval and signature prior to commencement of production. Return signed samples panel to manufacturer to implement warranty. Label each sample with brand name, product name, and manufacturer's code reference.
3. Sample Warranty Information for EMP sheets
    a. Minimum 15 year material warranty. Finish warranty as per paint manufacturer.

C. Product Data – Panel Support System:
1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of engineered metal plate/panel and accessory.
2. Shop Drawings: Submit shop drawings showing layout; details of edge conditions; joints; panel profiles; corners; and product components, including finish, color and texture, anchorage and attachment system. Distinguish between factory and field assembled work.
    1) Include details showing thickness and dimensions of the various systems parts, fastening and anchoring methods; locations of joints and the location and configuration of joints necessary to accommodate thermal movement.
    2) For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified Professional Engineer responsible for the preparation.
3. Sample showing finish, color and texture.
    1) Include separate sets of finish samples of aluminum panel support system, not less than 3" x 3" (76mm x 76mm), of each color and finish selected, to obtain color approval.
4. Quality Assurance Submittals:
    1) Include test reports for air infiltration, water penetration and structural performance.
    2) Designed Systems installation instructions.
    3) Closeout Submittals: Submit warranties specified elsewhere in this section.

D. Sample Warranty Information for panel system

**1.06 QUALITY ASSURANCE**

A. Manufacturer of Engineered Metal Plate (EMP) shall have a minimum of (2) yrs. experience in the manufacturing of this product.

B. Fabricator/Installer:
1. Shall have a minimum (5) yrs. experience of metal panel work and have adequate numbers of skilled workmen who are thoroughly trained and experienced to perform a project of this scope and size.
2. Manufacturer/Fabricator capable of providing field service representation during construction.
    a. List of five other projects of similar size, including approximate date of installation and name of Architect of each.
3. Conduct pre-installation meeting to verify project requirements, substrate conditions, weather proofing, flashing, installation instructions and warranty requirements. Field Quality Control: Comply with systems manufacturer's recommendations and guidelines.

**1.07 DELIVERY, STORAGE, AND HANDLING**

A. Protect finish and store in accordance with manufacturer's recommendations.

B. Manufacturer of composite panel shall produce a minimum of 10% extra material (up to 2000sf) to be available for quick delivery. This material is to be stored at manufacturer's facility for quick delivery, and

cannot be released for change orders until fabricator has determined that it will not be needed for possible damages.

C. Manufacturer of EMP to have a minimum of (5) yrs. established pallet return program for reuse/recycling.
D. Comply with manufacturer's/fabricator's ordering instructions and lead times. Requirements to avoid construction delays.
E. All materials under this section shall be delivered with the identification label intact, and be packaged, boxed wrapped in manufacturer's/fabricator's original, unopened, undamaged containers or be otherwise protected to assure complete protection from reasonable damage during shipment, storage and handling.
    a. Protect finish of panels by applying PVC removable plastic film. This film must be removed immediately after installation to avoid prolonged exposure to direct sun light.
    b. Protect Engineered Plate against transportation damage. Provide marking/labeling to identify components consistently with drawings.
    c. Exercise care in unloading, storing, and installing panels to prevent bending, warping, twisting and surface damage.
F. Materials shall be stored in enclosed spaces, above ground, under protective covers. Extreme care shall be taken to avoid contact with moisture, condensation, or materials which might cause staining, such as lime, cement, fresh concrete or chemicals.
G. Storage and Protection: Store materials protected from exposure to harmful weather conditions and at temperature condition recommended by the manufacturer/fabricator.
    a. Store panels in well ventilated space out of direct sunlight.
    b. Protect panels from moisture and condensation with tarpaulins or other suitably ventilated weather tight covering.
    c. Slope panels to insure positive drainage and prevent water accumulation.
    d. Do not store panels in any space where ambient temperatures can exceed 120°F (49°C).
H. Avoid Contact with any other material that might cause staining, denting, scratching or other surface damage.
I. To prevent adhesive transfer to finish, Panels must not be stored for prolonged periods of time, be stored in direct sunlight or be subjected to high heat prior to installation.

**1.08 PROJECT CONDITIONS**

A. Field measurements: Verify actual measurements and openings by field measurement before fabrication. Show recorded measurements on shop drawings. Coordinate field measurements and fabrication schedules with construction team to avoid delays.
    a. System must have base extrusions that can be placed on the wall directly over the weatherproofing and be flashed during or prior to field measurements. This allows protection of the weatherproofing during the panel fabrication process. Measurements can be taken from these installed base extrusions to provide accurate panel dimensions. This also allows the precise placement of centerline joints to adjacent material such as; curtainwall mullions, concrete panel joints and other design features.

## PART 2 – PRODUCTS

### 2.01 ENGINEERED METAL PLATE

A. Material: Engineered Metal Plate shall be manufactured by Fairview Architectural:
   1. VITRABOND G2, proprietary item of Fairview Architectural, 75 Peters Rd., Bloomfield CT 06002, +1-860-242-2711

B. Composition:
   1. Two sheets of aluminum sandwiching a dimpled core of aluminum material formed in a continuous heat fusion process. The core material shall be free of and not contain foamed insulation material. The core and skin materials shall be chemically bonded together. Products laminated sheet by sheet in a batch process using glues or adhesives between materials shall not be acceptable.

C. Aluminum Face Sheet:
   1. Thickness: 0.028" (0.7mm)
   2. Aluminum alloy shall be 3003

D. Plate Weight:
   1. 4mm (0.157"): 0.9 lbs/ft$^2$

E. Total Thickness:
   1. 4mm (0.157")

F. Product Performance:

   1. Bond Integrity
      When tested for bond integrity, in accordance with ASTM D 1781 (simulating resistance to panel delamination), there shall be no adhesive failure of the bond
      a) between the core and the skin nor
      b) cohesive failure of the core itself below 22.5 in-lb/in as manufactured or after 21 days soaking in water at 70°F (21°C)

   2. Fire Performance - (G2 Core)

| | |
|---|---|
| ASTM E 84 | Class A |
| ASTM E 136 | Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C |

   3. Finishes
      A. Coil coated KYNAR® 500 based Polyvinylidene Flouride (PVDF) or Fluoro Ethylene – Alkyl Vinyl Ether (FEVE) resin in conformance with the following general requirements of AAMA 2605.

         1. Color(s): (Select one of the following)
            a. To be chosen from standard VITRABOND color range
            b. Custom color to be matched by plate manufacturer
            c. Clear coat over brushed aluminum substrates

2. 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.
3. Gloss: ASTM D523. Standard at 60° shall be 25-35.
4. Flexibility: ASTM D4145. Shall be 0-2 T-Bend; No pick-off.
5. Adhesion: ASTM 3359. Reverse impact 1/16" crosshatch shall show no cracking or adhesion loss.
6. Reverse Impact: ASTM D2794. 1.5 x metal thickness (aluminum) shall show no cracking or adhesion loss.
7. Exterior Exposure: 10 years at 45°, South Florida. ASTM D2244 shall be Max. 5 fade and ASTM D4214 shall be Max. 8 chalk.
8. Acid Resistance: ASTM D1308. 10% muriatic acid – 24 hrs. shall show no effect. 20% sulfuric acid – 18 hrs. shall show no effect.
9. Alkali Resistance: ASTM D1308. 10%, 25% NaOH, 1 hr., shall show no effect.
10. 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.
11. Humidity Resistance: ASTM D714 and ASTM 2247. 100% relative humidity at 95°F. Shall pass 4,000 hrs. No #8 blisters.
12. Acid Rain Test: Kesternich SO2, DIN 50018. 15 cycles minimum. No objectionable color change.
13. Pencil Hardness: ASTM D3363. F-2H minimum.

## 2.02 METAL FLASHING MATERIALS

A. Material:
VITRAEDGE , proprietary item of Fairview Architectural, 75 peters Rd., Bloomfield, CT 06002, +1-860-242-2711

B. Composition:
VITRAEDGE, 3000 – 5000 Series aluminum alloy coil coated and color matched by Fairview Architectural

## 2.03 PLATE SUPPORT AND MOUNTING SYSTEM

A. Fairview Architectural North America – Series; Arrowhead Pressure Equalized Rain Screen System Compliant with AAMA 508-07 or Drained & Back Ventilated Rain Screen System Compliant with AAMA 509-09 Testing (Select one)
Contact: 4650 B Caterpillar Road, Redding, California 96003;
Phone 530-262-9881 Fax (530) 276-0610,
Email: david.simonsen@fairview-na.com
System must be demonstrated to be a truely non-progressively installed system.
   (a) System must allow for any damaged or defective panel to be removed and replaced without removing adjacent panels.
   (b) System must allow for panel(s) and reveals to be replaced while not compromising the integrity of the system or results from the AAMA 508 or AAMA 509 testing (Select one)

B. System must allow for optional system depths within the design of the system, not by shimming away from the wall or by utilizing deeper substrates.

C. System must allow for future replacement of panels without removing base panels.

D. System must have stiffeners mechanically fastened to panel frame extrusions for panel integrity.
E. System must allow panels to be locked in place with a pull-out tested twist lock connection.
F. In addition to being able to accommodate 4mm EMP, the system must be able to accommodate using .090" Aluminum Plate, .125" Aluminum Plate, 3mm MCM, 4mm MCM and or 6mm MCM.
G. Attachment Extrusions:
    1) All system extrusions to be alloy 6063-T-6
    2) Base and starter extrusions as required planed plumb level and true per system requirements.
    3) Frame extrusions mechanically attached to panel.
H. Stiffeners:
    1) Alloy 6063-T-6
    2) Spaced as required for flatness and or per G2 calculations if required.
    3) Attached with mechanical fasteners to frame extrusions and structural silicone to inside of panel surface.

**2.04 PANEL FABRICATION**

A. System Characteristics:
    1. Plans, elevations, details, characteristic, and other requirements indicated are based upon standards by one manufacturer. It is intended that other manufacturers, receiving prior approval, may be acceptable, provided their details and characteristics comply with size and profile requirements, and material/performance standards.
    2. Fabricate system to dimension, size, and profile indicated on the drawings based on a design temperature of 68°F - 70°F (20°C - 21°C).
    3. Compressive skin stresses to be avoided during fabrication. The installation detailing shall be such that the plate remains flat regardless of temperature changes and at all times remains air and water tight.
    4. The finish side of the plate shall have a removable plastic masking applied prior to fabrication, which shall remain on the panel during fabrication, shipping, and erection to protect the surface from damage.
B. System Type: (Select one of the following)
    1) Rain Screen - Pressure Equalized System (AAMA 508 compliant) – non-progressive
    2) Rain Screen - Drained and Back Ventilated System (AAMA 509 Compliant) – non-progressive
    3) Rain Screen - Rout and Return Wet Seal System (Caulked) - progressive
    4) Rain Screen - Rout and Return Dry Seal System - progressive
    5) VITRABOND EZ Wall System - progressive
    6) VITRABOND VHB Tape Fix System - progressive

C. System Performance: (for Rain Screen applications only)
    1. EMP system shall be capable of withstanding building movements and weather exposures based on the following test standards required by the Architect, Design Builder, and/or local building codes:
        a. Wind Load: If system tests are not already available, mock-ups shall be constructed and tests performed under the direction of an independent third-party laboratory must be provided to indicate the panel system has successfully passed the following standards:

i. Plates shall be designed to withstand the design wind load based upon the local building code. Wind-load testing shall be conducted in accordance with ASTM E330 to obtain the following results;
ii. Normal to the plane of the wall between supports, deflection of the secured perimeter-framing members shall not exceed L/175 or ¾", whichever is less.
iii. Normal to the plane of the wall, the maximum plate deflection shall not exceed L/60 of the full span.
iv. Maximum anchor deflection shall not exceed 1/16".
v. At 1 ½ times design pressure, permanent deflections of framing members shall not exceed L/100 of span length and components shall not experience failure or gross permanent distortion. At connection points of framing members to anchors, permanent set shall not exceed 1/16".

b. Air/Water System Test: If system tests are not already available, mock-ups shall be constructed and tests performed under the direction of an independent third-party laboratory must be provided to show compliance to the following minimum standards:
i. Air Infiltration: When tested in accordance with ASTM E283, air infiltration at 1.57 lb/ft² must not exceed 0.06 cubic feet per minute per square foot of wall area.
ii. Water Infiltration: Water infiltration is defined as uncontrolled water leakage through the exterior face of the assembly. No water infiltration shall occur in any part of the panel system under a differential static pressure of 6.24 lb/ft² after 15 minutes of exposure in accordance with ASTM E331.
iii. Pressure Equalized Rain Screen Systems shall comply with AAMA 508 Voluntary Test method and Specification for Pressure Equalized Rain Screen Wall Cladding Systems.

D. Tolerances:
1. Panel Bow: Maximum 0.8% of overall plate dimensions in length and width.
2. Panel Dimensions: Field fabrication shall be allowed where necessary, but shall be kept to an absolute minimum. All fabrication shall be done under controlled shop conditions when possible.
3. Panel dimensions shall be such that there is allowance for field adjustment and thermal movement. Any change in temperature due to climatic conditions shall not cause harmful buckling, opening of joints, undue stress on fastening and anchors, noise of any kind, or any other defects.
4. Panel lines, breaks, and angles shall be sharp, true, and surfaces free from warp and buckle.
5. Panels shall be visually flat, and free from any marks or scratches from fabrication.

**2.05 OTHER MATERIALS**

A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by Contractor subject to approval of the Architect.
B. Fasteners including concealed screws, nuts, bolts, and other items required for connection of aluminum components shall be of non-magnetic stainless steel.
C. All anchors, shims, clips, brackets and similar attachments shall be of aluminum or galvanized steel as specified.

## PART 3 – EXECUTION

### 3.01 INSPECTION AND PREPARATION

A. Verify that substrate is structurally sound, square, level, plumb, true, dimensionally accurate, and in accordance with approved shop drawings. Notify Contractor in writing of anything that could impact timely and accurate installation.

B. Adjacent Surfaces Protection: Protect adjacent work areas and finish surfaces from damage during product installation.

### 3.02 INSTALLATION

A. Component parts which are observed to be defective in any way, including warped, bowed, dented, abraded and broken members, must not be installed. Members or parts which have been damaged during installation or thereafter before substantial completion of the project shall be removed and replaced.

B. No cutting, trimming, welding or brazing of components which could in any way damage the finish, decrease the strength or result in visual imperfections or failure in performance shall be executed during installation. Components which require alteration shall be returned to the fabricator. If necessary, replace with new components.

C. Tolerances:
   1. All components shall be installed visually flat, level, true to line with uniform joints and reveals.
   2. Maximum deviation for vertical members: 1/8” over 18’ and 1/4” over 40’
   3. Maximum deviation for horizontal members: 1/8” over 30’

D. Anchorage of the cladding substructure to the building structure shall be by approved methods in strict accordance with the specified and approved shop and/or installation drawings. Supporting brackets shall be designed so as to provide three-dimensional adjustments and accurate location of wall components.

E. All joints between panels shall be set at widths as shown on the drawings with tolerance of $\pm$ 1/16”. No two adjacent or perpendicular joints shall have a difference in width of more than 1/8”. In addition, the tolerance between adjacent panels across any joint shall not exceed 1/16” locally.

F. Entire installation shall be in strict accordance with the fabricator’s instructions.

### 3.03 ADJUSTING

A. Repair panels with minor damage so those repairs are not discernable at a distance of 120” (10’-0” or 3.1m)

B. Remove and replace panels damaged beyond repair per Panel System’s replacement instructions.

C. Remove protective film immediately after installation of panels to avoid prolonged exposure to sunlight.
D. Remove from project site damaged panels, protective film and other debris attributable to work of this section.

**3.04 CLEANING AND PROTECTION**

A. Final Cleaning: when installation is complete, remove extraneous matter and marks off the façade components in a manner which leaves the completed installation free of any streaking, spotting or non-uniform appearance.

B. Protection: Protect as necessary and leave the finished work undamaged on completion.

END OF SECTION