

Technical Evaluation Report™

TER 1905-04

Vitrabond® – Canada

Fairview Architectural

Product:

Vitrabond® Metal Composite Material (MCM)

Issue Date:

February 5, 2020

Revision Date:

February 24, 2023

Subject to Renewal:

January 1, 2024



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SECTION: 07 42 00 - Wall Panels

SECTION: 07 42 13.23 - Metal Composite Material Wall Panels

SECTION: 07 42 43 - Composite Wall Panels

1 Product Evaluated¹

- 1.1 Vitrabond® Metal Composite Material (MCM)

2 Applicable Codes and Standards²

2.1 Codes

- 2.1.1 *NBC—10, 15: National Building Code of Canada*

2.2 Standards and Referenced Documents

- 2.2.1 *AAMA 2605: Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix)*
- 2.2.2 *ASCE/SEI 7: Minimum Design Loads and Associated Criteria for Buildings and Other Structures*
- 2.2.3 *ASTM D1781: Standard Test Method for Climbing Drum Peel for Adhesives*
- 2.2.4 *ASTM E330: Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights, and Curtain Walls by Uniform Static Air Pressure Difference*
- 2.2.5 *CAN/ULC-S102: Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies*
- 2.2.6 *CAN/ULC-S134: Fire Test of Exterior Wall Assemblies*

¹ For more information, visit dricertification.org or call us at 608-310-6748.

² Unless otherwise noted, all references in this TER are from the 2015 version of the NBC. This alternative solution is also approved for use with the 2010 NBC and the standards referenced therein.

3 Performance Evaluation

- 3.1 Vitrabond® was evaluated to determine the following properties for use as a cladding material in accordance with NBC Division B for combustible and noncombustible construction.
 - 3.1.1 Structural design in accordance with NBC Division B Part 4 and Article 9.4.1.1,
 - 3.1.2 Wind resistance in accordance with NBC Division B Subsection 4.1.7 and Article 4.1.7.3,
 - 3.1.3 Weather resistance in accordance with NBC Division B Section 5.5 and Section 5.6 and Article 9.27.1.1,
 - 3.1.4 Durability in accordance with NBC Division B Article 5.1.4.2,
 - 3.1.5 Use in combustible and noncombustible construction in accordance with NBC Division B Article 3.1.5.1, Article 3.1.5.5, and Section 9.10,
 - 3.1.6 Use as an interior finish in noncombustible construction in accordance with NBC Division B Article 3.1.5.12, and
 - 3.1.7 Surface burning characteristics in accordance with NBC Division B Subsection 3.1.12 and Article 9.10.3.2.
- 3.2 Use of Vitrabond® as part of a fire separation is outside the scope of this TER.
- 3.3 Any code compliance issues not specifically addressed in this section are outside the scope of this TER.
- 3.4 Any engineering evaluation conducted for this TER was performed on the dates provided in this TER and within DrJ's professional scope of work.

4 Product Description and Materials

- 4.1 Vitrabond® is a lightweight Metal Composite Material (MCM) cladding panel manufactured in a continuous coil process by fusing metal skins to a composite core (Figure 1).

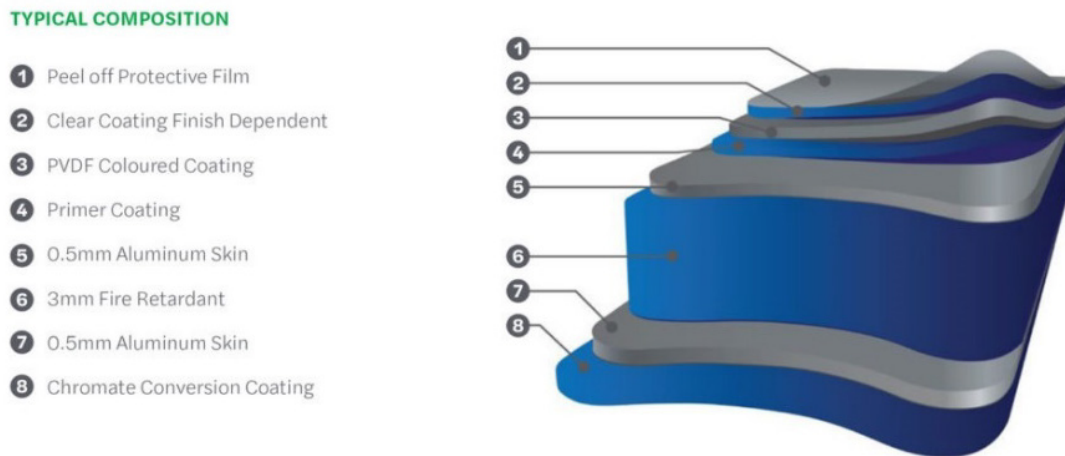


Figure 1. Typical Composition of Vitrabond® MCM Panel

4.2 Material Availability

- 4.2.1 Thickness: 3 mm (0.188"), 4 mm (0.157"), and 6 mm (0.236"),
- 4.2.2 Width: Standard: 100 cm (39.4"), 125 cm (49.2"), and 157 cm (62"),
- 4.2.3 Length: 310 cm (122"), 371 cm (146"), and 498 cm (196"), and
- 4.2.4 Custom sizes are available in widths between 91 cm (36") and 203 cm (80") and in lengths up to 6.50 m (256").
- 4.2.5 See fairview-na.com for available finishes.
- 4.3 The Vitrabond® panels are installed using the [Arrowhead® Panel System](#). The Arrowhead® Panel System is outside the scope of this TER.

5 Applications

5.1 General

- 5.1.1 Vitrabond® panels are used as a cladding material in accordance with NBC Article 3.2.3.7 and Section 9.27. The panels are installed over wood-framed, steel-framed, masonry, or concrete walls capable of supporting the imposed loads in accordance with NBC Division B Subsection 4.1.7.
- 5.1.2 Building occupancy classification should be determined in accordance with NBC Table 3.1.2.1.
- 5.1.3 Where the application exceeds the limitations set forth herein, design shall be permitted in accordance with accepted engineering procedures, experience, and technical judgment.

5.2 Structural Design

- 5.2.1 Walls incorporating Vitrabond® shall be designed to resist wind loads per NBC Division B Part 4.
- 5.2.2 Vitrabond® panels are capable of resisting the loads shown in Table 1.

Table 1. Specified Wind Pressure Resistance^{1,2}

Product	Specified Wind Pressure (kPa)
Vitrabond®	2.5
SI: 1 in = 25.4 mm, 1 psf = 0.0479 kPa 1. Tested in accordance with ASTM E330. 2. Panels tested were 1.2 m (3' 11 ¹ / ₁₆ " square.	

5.3 Weather Resistance

- 5.3.1 Vitrabond® may be used in exterior cladding assemblies in accordance with NBC Division B Section 5.5 and Section 5.6 where a protective material is properly installed behind the Vitrabond® per NBC Article 5.6.1.2.(1) and sealed per NBC Article 5.6.2.1 and Note A-5.6.2.1.
- 5.3.2 The protective material shall be installed and sealed prior to the installation of Vitrabond® using the Arrowhead® panel system.

5.4 Fire-Resistance

- 5.4.1 Vitrabond® has not been evaluated for use as part of a fire separation.

5.5 Surface Burning Characteristics

- 5.5.1 Vitrabond® has the surface burning characteristics shown in Table 2 and is approved for use as an interior finish in noncombustible construction.

Table 2. Surface Burning Characteristics

Product	Flame Spread Rating	Smoke Developed Classification
Vitrabond®	≤ 25	≤ 50
1. Tested in accordance with CAN/ULC-S102.		

5.6 Full Scale Tests

- 5.6.1 Vitrabond® was tested to assess performance of vertical and lateral fire propagation in accordance with CAN/ULC-S134 and NBC Division B Article 3.1.5.5 for use as a combustible cladding on exterior walls in noncombustible construction (Table 3).

Table 3. Combustible Cladding on Exterior Walls Conditions of Acceptance

Product	Flame Spread (m)	Heat Flux (kW/m ²)
Vitrabond®	≤ 5	≤ 35
SI: 25.4 mm = 1 in 1. Tested in accordance with CAN/ULC-S134.		

- 5.7 The wall assemblies in Table 4 are approved for use in buildings of noncombustible construction.

Table 4. Approved CAN/ULC S-134 Wall Assemblies

Wall Component	Materials
Base Wall	CMU Concrete Walls
Exterior Sheathing	15.9 mm (5/8") thick exterior gypsum sheathing
Weather Barrier Applied to Exterior Sheathing or Base Wall Surface (under the wall insulation)	SOPREMA® SOPRASEAL® Stick VP
Wall Brackets	ACS Clips spaced horizontally 610 mm (24") o.c. with 18 ga galvanized Z-girts
Wall Insulation	152 mm (6") nominal thick ROCKWOOL™ CAVITYROCK® Mineral Wool
Window Header and Floor Line Insulation	25.4 mm (1") nominal thick ROCKWOOL™ AFB®, 305 mm (12") wide x 1220 mm (48") length behind all horizontal base extrusions
Cavity Insulation	None
Weather-Resistive Barrier Applied over Exterior Insulation (or FRTW)	None
Exterior Cladding MCM with maximum 64 mm (2½") air gap between panel and insulation	4 mm Fairview Vitrabond® FR Core MCM
SI: 1 in = 25.4 1. The assembly was tested in accordance with CAN/ULC S-134.	

6 Installation

- 6.1 Installation shall comply with the manufacturer installation instructions and this TER. In the event of a conflict between the manufacturer installation instructions and this TER, the more restrictive shall govern.
- 6.2 Vitrabond® MCM panels must be installed using the Arrowhead® Panel System according to the manufacturer installation instructions.
- 6.3 Component parts that 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.

- 6.4 No cutting, trimming, welding, or brazing of components that 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 that require alteration shall be returned to the fabricator. If necessary, replace with new components.
- 6.5 *Tolerances*
- 6.5.1 All components shall be installed visually flat, level, true to line with uniform joints and reveals.
- 6.5.2 Maximum deviation for vertical members is 3 mm ($\frac{1}{8}$ ") over 5.5 m (18') and 6 mm ($\frac{1}{4}$ ") over 12.2 m (40').
- 6.5.3 Maximum deviation for horizontal members is 3 mm ($\frac{1}{8}$ ") over 9.1 m (30').
- 6.6 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 to provide three-dimensional adjustments and accurate location of wall components.
- 6.7 All joints between panels shall be set at widths as shown on the drawings with tolerance of +/- 1.5 mm ($\frac{1}{16}$ "). No two adjacent or perpendicular joints shall have a difference in width of more than 3 mm ($\frac{1}{8}$ "). In addition, the tolerance between adjacent panels across any joint shall not exceed 1.5 mm ($\frac{1}{16}$ ") locally.
- 6.8 *Repairs*
- 6.8.1 Repair panels with minor damage so those repairs are not discernable at a distance of 120" (10 ft or 3.1 m).
- 6.8.2 Remove and replace panels damaged beyond repair per Arrowhead® Panel System's replacement instructions.
- 6.8.3 Remove protective film immediately after installation of panels to avoid prolonged exposure to sunlight.
- 6.8.4 Remove from project site damaged panels, protective film, and other debris attributable to work of this section.
- 6.9 *Protection*
- 6.9.1 When installation is complete, remove extraneous matter and marks off the façade components in a manner that leaves the completed installation free of any streaking, spotting, or non-uniform appearance.
- 6.9.2 Protect as necessary and leave the finished work undamaged on completion.
- 6.9.3 Panels shall be stored in well-ventilated space and out of direct sunlight.

7 Substantiating Data

- 7.1 Testing has been performed under the supervision of a professional engineer and/or under the requirements of ISO/IEC 17025 as follows:
- 7.1.1 Wind load resistance testing in accordance with ASTM E330,
- 7.1.2 Weather resistance testing in accordance with AAMA 2605,
- 7.1.3 Durability testing in accordance with ASTM D1781,
- 7.1.4 Surface burning characteristics testing in accordance with CAN/ULC S102, and
- 7.1.5 Full-scale fire resistance testing in accordance with CAN/ULC S134.
- 7.2 Information contained herein is the result of testing and/or data analysis by sources that conform to the evaluation requirements of NBC Volume 1 Relationship of the NBC to Standards Development and Conformity Assessment and/or professional engineering regulations. DrJ relies upon accurate data to perform its ISO/IEC 17065 evaluations.

- 7.3 Where appropriate, DrJ's analysis is based on provisions that have been codified into law through provincial, territorial, or local adoption of codes and standards. The providers of the codes and standards are legally responsible for their content. DrJ analysis may use code-adopted provisions as a control sample. A control sample versus a test sample establishes a product as being equivalent to that prescribed in this code in quality, strength, effectiveness, fire resistance, durability and safety. Where the accuracy of the provisions provided herein is reliant upon the published properties of materials, DrJ relies upon the grade mark, grade stamp, mill certificate, and/or test data provided by material suppliers to be minimum properties. DrJ analysis relies upon these properties to be accurate.

8 Findings

- 8.1 When used and installed in accordance with this TER and the manufacturer installation instructions, the product listed in Section 1.1 is approved for the following:
- 8.1.1 Use as a code-compliant combustible cladding material in exterior applications of combustible and noncombustible construction, and
 - 8.1.2 Use as a code-compliant finish material in interior applications of combustible and noncombustible construction.
- 8.2 This product has been evaluated in the context of the codes listed in Section 2 and is compliant with all known provincial, territorial, and local building codes. Where there are known variations in provincial, territorial, or local codes applicable to this TER, they are listed here.
- 8.2.1 No known variations
- 8.3 NBC Volume 1 Relationship of the NBC to Standards Development and Conformity Assessment:

Certification

Certification is the confirmation by an independent organization that a product or service meets a requirement...Certification bodies publish lists of certified products and companies.

Evaluation

An evaluation is a written opinion by an independent professional organization that a product will perform its intended function in a building. An evaluation is very often done to determine the ability of an innovative product, for which no standards exist, to satisfy the intent of the Code requirement...Several organizations, including the Canadian Construction Materials Centre (CCMC), offer such evaluation services.

- 8.4 Valid evaluations are obtained from independent professional organizations, which include but are not limited to ISO/IEC 17065 accredited evaluation services and professional engineers.³
- 8.5 ISO/IEC 17065 accreditation bodies, including but not limited to SCC and ANAB, confirm that product certification bodies have the expertise to provide evaluation services within their scope of accreditation. All SCC and ANAB product certification bodies meet NBC requirements to offer evaluation services for alternative solutions.⁴
- 8.5.1 DrJ is an ISO/IEC 17065 ANAB-Accredited Product Certification Body – Accreditation #1131 and employs professional engineers.⁵

³ NBC Division C Article 2.2.1.2

⁴ NBC Division A Clause A-1.2.1.1.(1)(b) provides information on code compliance via alternative solutions and defines alternative solutions as "...achiev[ing] at least the minimum level of performance required by Division B." NBC Division C Section 2.3 includes additional guidance for documentation of alternative solutions.

⁵ Through ANAB accreditation and the IAF MLA, DrJ certification can be used to obtain material, product, design, or method of construction approval in any jurisdiction or country that has IAF MLA Members & Signatories to meet the Purpose of the MLA – "certified once, accepted everywhere."

- 8.6 Product certification organizations, accredited by the SCC and ANAB, are defined as equivalent evaluation services:
- 8.6.1 The [Canada-United States-Mexico Agreement \(CUSMA\) Article 11.6 Conformity Assessment](#) confirms mutual recognition by stating, "...each Party shall accord to conformity assessment bodies located in the territory of another Party treatment no less favorable than that it accords to conformity assessment bodies located in its own territory or in the territory of the other Party."
 - 8.6.2 The SCC [National Conformity Assessment Principles](#) states, "SCC is a member of a number of international organizations developing voluntary conformity assessment agreements that help ensure the international acceptance of Canadian conformity assessment results. Signatories to these agreements (like SCC) recognize each other's accreditations as being equivalent to their own."⁶
- 8.7 Building official approval of a licensed professional engineer is performed by verifying the professional engineer and/or their business entity are listed by the [licensing board](#) of the relevant jurisdiction.

9 Conditions of Use

- 9.1 The Vitrabond® panels described in this TER comply with, or are a code compliant alternative material to that specified in the codes listed in Section 2, subject to the following conditions:
- 9.1.1 Vitrabond® panels shall be separated from the interior of a building by an approved thermal barrier in accordance with NBC Division B Section 5.3.
 - 9.1.2 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 that might cause staining, such as lime, cement, fresh concrete, or chemicals.
 - 9.1.3 *Storage and Protection:*
 - 9.1.3.1 Store materials protected from exposure to harmful weather conditions and at temperature condition recommended by the manufacturer/fabricator.
 - 9.1.3.2 Store panels in well-ventilated space out of direct sunlight.
 - 9.1.3.3 Protect panels from moisture and condensation with tarpaulins or other suitably ventilated weather tight covering.
 - 9.1.3.4 Slope panels to ensure positive drainage and prevent water accumulation.
 - 9.1.3.5 Do not store panels in any space where ambient temperatures can exceed 49°C (120°F).
 - 9.1.3.6 Avoid contact with any other material that might cause staining, denting, scratching, or other surface damage.
 - 9.1.3.7 To prevent adhesive transfer to the finish, exterior aluminum/composite wall panels must not be stored for prolonged periods of time, be stored in direct sunlight, or be subjected to high heat prior to installation.
 - 9.2 Where required by the authority having jurisdiction (AHJ) in which the project is to be constructed, this TER and the installation instructions shall be submitted at the time of permit application.
 - 9.3 Any generally accepted engineering calculations needed to show compliance with this TER shall be submitted to the AHJ for review and approval.
 - 9.4 Design loads shall be determined in accordance with the building code adopted by the jurisdiction in which the project is to be constructed and/or by the designer (e.g., owner).
 - 9.5 At a minimum, this product shall be installed per Section 6 of this TER.

⁶ The National Conformity Assessment Principles states, "Product regulations and standards may vary from country to country. If these are set arbitrarily, they could be deemed as protectionist. The [World Trade Organization \(WTO\) Agreement on Technical Barriers to Trade \(TBT Agreement\)](#) is intended to ensure that technical regulations, standards and conformity assessment procedures of member countries do not create unnecessary obstacles to trade. Under the TBT Agreement, members of the WTO agree to use international standards, including conformity assessment standards and guides, as a basis for their technical requirements."



- 9.6 This product has an internal quality control program and a third-party quality assurance program in accordance with ISO/IEC 17065 certification procedures.
- 9.7 The actual design, suitability, and use of this TER, for any particular building, is the responsibility of the owner or the owner's authorized agent.
- 9.8 This TER shall be reviewed for code compliance by the AHJ in concert with the duties and powers granted to the building official by the provincial regulations governing such duties and powers.
- 9.9 The implementation of this TER for this product is dependent on the design, quality control, third-party quality assurance, proper implementation of installation instructions, inspections, and any other code or regulatory requirements that may apply.

10 Identification

- 10.1 The product listed in Section 1.1 is identified by a label on the board or packaging material bearing the manufacturer name, product name, TER number, and other information to confirm code compliance.
- 10.2 Additional technical information can be found at fairview-na.com.

11 Review Schedule

- 11.1 This TER is subject to periodic review and revision. For the most recent version, visit drjcertification.org.
- 11.2 For information on the current status of this TER, contact [DrJ Certification](#).