

## Summary of Technical Data Sheet - ALPOLIC®/fr ZCM Zinc Composite Material

### 1. General

ALPOLIC®/fr ZCM is a zinc composite material with a non-combustible mineral-filled core, used as an exterior cladding and roof covering on new buildings and retrofit applications. The material is manufactured by Mitsubishi Plastics Composites America, Inc., a subsidiary company of Mitsubishi Plastics, Inc., and furnished by approved dealers or distributors.

**Note:** Specification data may be changed in part without affection of material quality.

### 2. Product composition

ALPOLIC/fr ZCM is composed of a non-combustible mineral-filled core sandwiched between two skins of 0.5mm thick zinc:

#### Composition

Topside skin material; 0.5mm thick zinc sheet  
Core material; Non-combustible mineral-filled core  
Backside skin material; 0.5mm thick zinc sheet

The core has the same contents as the established fire-retardant core of ALPOLIC/fr. The topside surface is protected with a self-adhesive peel-off protective film.

### 3. Surface finish

ALPOLIC®/fr ZCM is produced using VM Zinc's Quartz Zinc Coils. The skin metal is a real zinc alloy weathered with a chemical conversion process, which later develops to a distinctive gray appearance through natural weathering.

### 4. Product dimension and tolerance

- (1) Panel thickness: 4 mm
- (2) Panel size: Width = 965 mm  
Length = 3708 mm
- (3) Product tolerance
  - Width: ±2.0 mm
  - Length: ±4.0 mm
  - Thickness: ±0.2 mm
  - Bow: Maximum 0.5% (5mm/m) of the length or width
  - Square-ness (diagonal difference): Maximum 5.0 mm

### 5. Principal properties

- (1) Panel weight: 12.5 kg/m<sup>2</sup>
- (2) Thermal expansion ratio: (P)  $28 \times 10^{-6} / ^\circ\text{C}$  (T)  $20 \times 10^{-6} / ^\circ\text{C}$   
(P= Parallel to the rolling direction T = Transverse to the rolling direction)
- (3) Bond integrity: Peel Strength (ASTM D1781): 100 N-m/m minimum. No degradation in bond performance after 8 hours of submersion in boiling water and after 21 days of immersion in water at 21 degrees C.

(4) Impact resistance:

Steel ball weight (0.5 inch diameter)	Height inches / mm	Dent Depth inches / mm
2 lb / 0.9 kg	6" / 152 mm	0.028" / 0.7 mm
2 lb / 0.9 kg	12" / 305 mm	0.035" / 0.9 mm
2 lb / 0.9 kg	18" / 457 mm	0.042" / 1.1 mm
2 lb / 0.9 kg	24" / 610 mm	0.056" / 1.4 mm
2 lb / 0.9 kg	36" / 914 mm	0.095" / 2.4 mm

(5) Mechanical properties of ZCM:

Property	ASTM	Unit	4 mm ZCM
Elongation	E8	%	(P) 36.9 (T) 16.4
Yield Strength	E8	MPa psi	(P) 34 (T) 49 (P) 4989 (T) 7054
Mean Flexural Strength	C393	MPa psi	128 18495
Flexural Modulus	C393	MPa psi	28896 4.191* 10 <sup>6</sup>

P= Parallel to the rolling direction. T = Transverse to the rolling direction

## 6. Fire performance

We estimate that ZCM will have a lower fire resistance than ALPOLIC/fr has, because of the lower melting point of zinc alloy. Following is the test results of ALPOLIC/fr ZCM.

Country	Test standard	Result & Classification
UK	BS476 Part 6	Class 0
	BS476 Part 7	Class 1
USA	ASTM E 84 (Tunnel test)	Class A Flame spread: 20-25 Smoke develop: 40 - 70

## 7. General notes

(1) Processing method

As the machining performance of zinc metal is quite similar to that of aluminum metal, we can process ZCM with the same machines and tools that we have used for Aluminum Composite Material (ACM). The working parameters are also the same, as long as the processing is in the extent of usual range. Namely, we can cut ZCM with circular saws, fold it after grooving with router, bend it with a 3-roll bender and press brake, and weld it with hot-melt adhesive.

(2) Galvanic corrosion

Contact between different metals will cause an electrochemical reaction under moist conditions. As zinc has a lower corrosion potential than copper and iron, galvanic corrosion will accelerate the corrosion of zinc alloy with these metals. Use stainless steel and aluminum for screws and rivets for assembling ZCM panels.

(3) Color difference between production lots

It is possible that the color of initial finish shows an obvious difference between production lots. We recommend ordering the full quantity for the project in one order. Even in one production lot, slight color difference may exist in the initial finish, although it is produced in a continuous chemical process.

#### (4) Handling

When you handle a long ZCM panel, hold the middle of the panel in addition to both ends, because ZCM is heavier than ALPOLIC/fr 4mm and tends to have a large warping with its dead load.

#### (5) Storing and transportation

Store the panels in a less humid and ventilated indoor places. Avoid contact with wet surface and keep dry during transportation and at construction site.

#### (6) Protective film

The ZCM surface is covered with a peeling-off film to protect from scratch during fabrication and installation. Remove the film soon after the installation is completed. Leaving the film long after installation may cause an extreme difficulty in removing the film.

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