

## Technical Data Sheet



**ALUCOPANEL® U.S.A FR**

EN 13501-1 B-s1, d0 | ASTM D1929 480 degrees, ASTM E84 Class A



# ALUCOPANEL® U.S.A FR

EN 13501-1 B-s1, d0 | ASTM D1929 480 degrees, ASTM E84 Class A

## PRODUCT COMPOSITION

**Alucopanel USA FR** is composed of two sheets of aluminum alloy 3000 Series with 0.50 mm thickness on Top (Coated with high quality PVDF Paint comes in various finishes such as Solid Colors & Metallic colors) & Bottom (primer coated) that is sandwiched with mineral filled flame retardant ingredients as core material, hence Alucopanel USA FR have achieved “**Class A**” in accordance to ASTM E84, “**Class B-s1, d0**” when tested in accordance to EN 13501-1, **Class “O”** when tested in accordance to British Standard BS 476 Part 6, “**Class 1**” when tested in accordance to British Standard BS 476 Part 7 which are mandatory requirements of relevant internationally acceptable standards and is best suitable for external and internal uses.

Core of the panel are mainly composed of mineral which can resist fire, however a small amount of Polyethylene also included. Main ingredient (minerals) does not permit the propagation of flame and restricts development of smoke.

The core material formed in a continuous co-extrusion process with high molecular adhesives. The core material is free of voids and air spaces and does not contain foamed insulation materials.

### THICKNESS:

4 mm  
6 mm

### PANEL WEIGHT:

7.8 to 8.0 Kgs/m<sup>2</sup>,  
10.5 to 11.0 Kgs/m<sup>2</sup>

## ALUCOPANEL® U.S.A FR

### COMPOSITION

#### 0.5mm TOP ALUMINUM SHEET

Protective Film  
PVDF Coating  
Primer  
Chromate Treatment

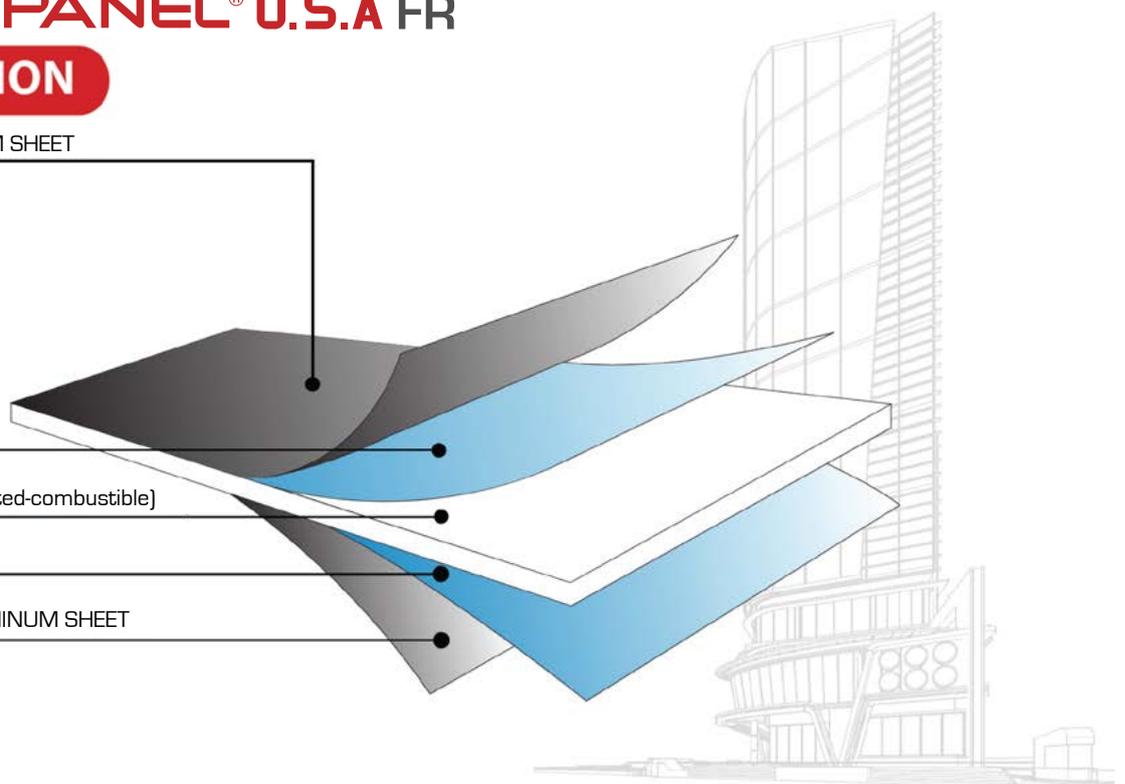
DuPont Adhesive

Mineral filled core (Limited-combustible)

DuPont Adhesive

#### 0.5mm BOTTOM ALUMINUM SHEET

Chromate Treatment  
Primer  
Service Coat



**STANDARD COMPOSITION**

| Product           | Total Panel Thick (mm) | Component Thickness (mm) |         |                          | Aluminum Grade       | Core Material                   |
|-------------------|------------------------|--------------------------|---------|--------------------------|----------------------|---------------------------------|
|                   |                        | Top Alum Skin            | Core FR | Bottom Alum Skin         |                      |                                 |
| ALUCOPANEL USA FR | 4                      | PVDF Coated 0.50 mm      | 3.0 mm  | Polyester Coated 0.50 mm | Alloy AA 3000 series | Mineral filled flame retardants |

**PRODUCT DIMENSION**

Alucopanel USA FR is available in various dimensions however standard panel size is 4 mm X 1250 mm X 3200 mm

Other custom sizes can be produced upon request:

| Dimension | Unit | Standard | Non Standard                |
|-----------|------|----------|-----------------------------|
| Width     | mm   | 1250     | 1000 mm / 1500 mm / 1575 mm |
| Length    | mm   | 3200     | ≤ 6000                      |
| Thickness | mm   | 4        | 3, 5 & 6                    |

**TOLERANCES**

Dimensional / Standard Size (Rounded)

Thickness: ± 0.20 mm  
 Width: ± 2.0 mm  
 Length: ± 2.0 mm  
 Squareness: 5 mm maximum

**PRODUCT PERFORMANCE (PHYSICAL PROPERTIES)**

**Bond Integrity**

Bond integrity tested, [simulating resistance to panel de-lamination], there shall be neither adhesive failure of the bond.

- Between the core and the skin nor
- Cohesive failure of the core itself below the following values:

Peel Strength: 183.87 N mm/mm as tested in accordance to ASTM D1781.  
 "Alucopanel USA FR has achieved World's highest lamination strength"

## PHYSICAL PROPERTIES

| Name                         | Unit              | Thickness    |       |
|------------------------------|-------------------|--------------|-------|
|                              |                   | 4 mm         | 6 mm  |
| Density                      | g/cm <sup>3</sup> | 1.95         | 1.75  |
| Weight                       | kg/m <sup>2</sup> | 7.80         | 10.50 |
| Thermal Conduction (U-Value) | W/mK              | 0.44 to 0.47 |       |
| Deformation temperature      | °C                | 181.1        |       |

## COMPARISON WITH OTHER BUILDING MATERIALS

| Physical Properties          | Alucopanel USA FR | AL   | FE  | S. Steel | Concrete | Glass | Acrylic Sheet | Gypsum |
|------------------------------|-------------------|------|-----|----------|----------|-------|---------------|--------|
| Specific Gravity             | 1.75 - 1.95       | 2.71 | 7.9 | 7.9      | -        | 2.5   | 1.2           | 0.86   |
| Thermal Conductivity W/(m.K) | 0.44 - 0.47       | 210  | 45  | 17       | 1.62     | 1     | -             | 0.04   |

## COMPARISON OF WEIGHT & RIGIDITY

| ALUCOPANEL USA FR<br>Specific Gravity: 1.9 |            |                             | ALUMINUM<br>Specific Gravity: 2.71 |                             |                | STAINLESS STEEL<br>Specific Gravity: 7.89 |                             |                |
|--------------------------------------------|------------|-----------------------------|------------------------------------|-----------------------------|----------------|-------------------------------------------|-----------------------------|----------------|
|                                            | Thick (mm) | Weight (Kg/m <sup>2</sup> ) | Thick (mm)                         | Weight (Kg/m <sup>2</sup> ) | Weight Ratio % | Thick (mm)                                | Weight (Kg/m <sup>2</sup> ) | Weight Ratio % |
| ALUCOPANEL USA FR                          | 4 MM       | 7.80                        | 3.30                               | 8.9                         | 62             | 2.4                                       | 18.9                        | 29             |
|                                            | 6 MM       | 10.50                       | 4.50                               | 12.2                        | 61             | 3.2                                       | 25.2                        | 29             |

## DEFLECTION TEMPERATURE

Alucopanel USA FR is having an approximate Deflection Temperature of 181.1°C. This characteristic proves the property of panel to resist boiling water. The Alucopanel USA FR has a temperature stability of -40°C to +80°C, and recommended heating temperature and duration for heating the Panels as follows:

- Heating less than 30 Minutes Max Temperature 90°C
- Heating more than 30 Minutes Max Temperature 70°C

## VIBRATION DAMPING

Alucopanel USA FR has best vibration damping effect that absorbs mechanical energy arises out of vibration to convert it into thermal energy.

## BENDING LIMIT

Alucopanel USA FR can be bent in a Press Break or 3-roll Bending machine. Normally the smallest radius that can be applied to bend the panel without wrinkles at the radial surface of panel is termed as the bend radius. In 3 roll machine the bending diameter depends on the roll diameter, length and type of machine.

**Smallest bending radius (Parallel in Press Break Machine)**

| Thickness | ALUCOPANEL USA FR |
|-----------|-------------------|
| 4 mm      | 100 mm            |
| 6 mm      | 120 mm            |

**THERMAL CONDUCTIVITY**

Compared to solid materials ALUCOPANEL USA FR has a lower thermal conductivity the table below shows the thermal conductivity comparison of different materials.

| MATERIAL               | Thermal Conductivity[W/ (mK)] |
|------------------------|-------------------------------|
| 4 mm ALUCOPANEL USA FR | 0.45                          |
| Solid Aluminum         | 205                           |
| Steel                  | 50.2                          |
| Polyurethane           | 0.02                          |
| Glass Wool             | 0.04                          |
| Brick                  | 0.28                          |
| Concrete               | 0.80                          |
| Gypsum Board           | 0.13                          |
| Air at 0°C             | 0.024                         |

**COATING FINISHES**

Aluminum Coil Alloy (3000 Series) coated with KYNAR® 500 based Polyvinylidene Fluoride (PVDF utilizing with minimum 70% resin).

PVDF Coating system offers two or three layer coating depending on color selection such as Metallic colors and Normal RAL Colors. Metallic Colors are normally Two (2) coat system consisting Primer & Polyvinylidene fluoride color coat; in conformance with the following general requirements of AAMA 620.

**Color:**

Generally we are manufacturing ACP with various options of color coating, basically we have two different types of colors such as Solid & Metallic finishes.

Custom color can be developed if required by Client / Consultant / Architect / Project Engineer.

## **PANEL STRENGTH**

Alucopanel USA FR used for the external cladding must stand the wind load. This wind load will cause deflection of the panels and if the deflection is small the panel will not deform.

The permanent deformation of the panel is calculated by 0.2% yield stress divided by the safety factor. In the calculation we are assuming that the total strength of the panel is the strength of the Aluminum skins. If the calculated 2% proof stress is greater than the permissible, normally the panel is strengthened by giving additional stiffeners. The other factors affecting the strength of the panel are:

1. Panel thickness, width and length
2. Supporting conditions.
3. Wind load

We are using the Aluminum Alloy 3000 series for our ALUCOPANEL USA FR, Aluminum skins 2% proof stress is 152 MPa and suitable where the wind speed is 50m/sec.

## **JOINING HOLES / BOLTS & NUTS**

In the installation work other important factors are the strength of the joining holes and the rivets. Normally the distance from the Hole center to the panel edge should be 2 times larger than hole diameter. And to prevent the galvanic corrosion of the panels use only Aluminum or stainless steel rivets, bolts nuts etc. if we are using dissimilar metals lay a coating to prevent the galvanic corrosion.

## **STRENGTH OF SUBSTRUCTURE**

The sub structure where we are installing the panels should take the wind load and the panels. The strength of the substructure depends on the material and section of the structure, anchoring intervals of sub structure and wind pressure. The maximum deflection on the sub structure must be smaller than the 0.5% of supporting intervals.

## **PRODUCT WARRANTY**

Alucopanel USA FR Aluminum Composite Panels manufactured by Alucopanel Middle East LLC will be warranted for a period of 20 Years from the date of supply, as per our standard product warranty policy. Formal Warranty documentation will be issued in the name of Client and will be endorsed by the regional agents or the company itself.