

## Egypt Africa

Egypt Africa is deservedly the largest Cladding Factory in the middle east & Africa.

Out of all the four elements, fire happens to be the most untamable and dangerous one. It can burn an entire building down to ashes.

A fire could have dire consequences for people living in high-rise or industrial buildings, hospitals, libraries, shopping centres, hotels, airports, museums, commercial centres, tunnels, or underground stations. Thus, the exterior ACP cladding and the interior aluminum composite panels must be made of fire-retardant materials.

To merely ensure our ACP performs perfectly, We start by choosing Aluminum Alloy 5005/3003 offering a great mechanical property, weathering resistance and ease of proper maintenance.

**B1 Plus**

المواصفات الفنية لمنتج  
إيجيبت افريقيا المقاوم للحريق

# Technical Data Sheet

## Egypt Africa

### **B1 Plus**

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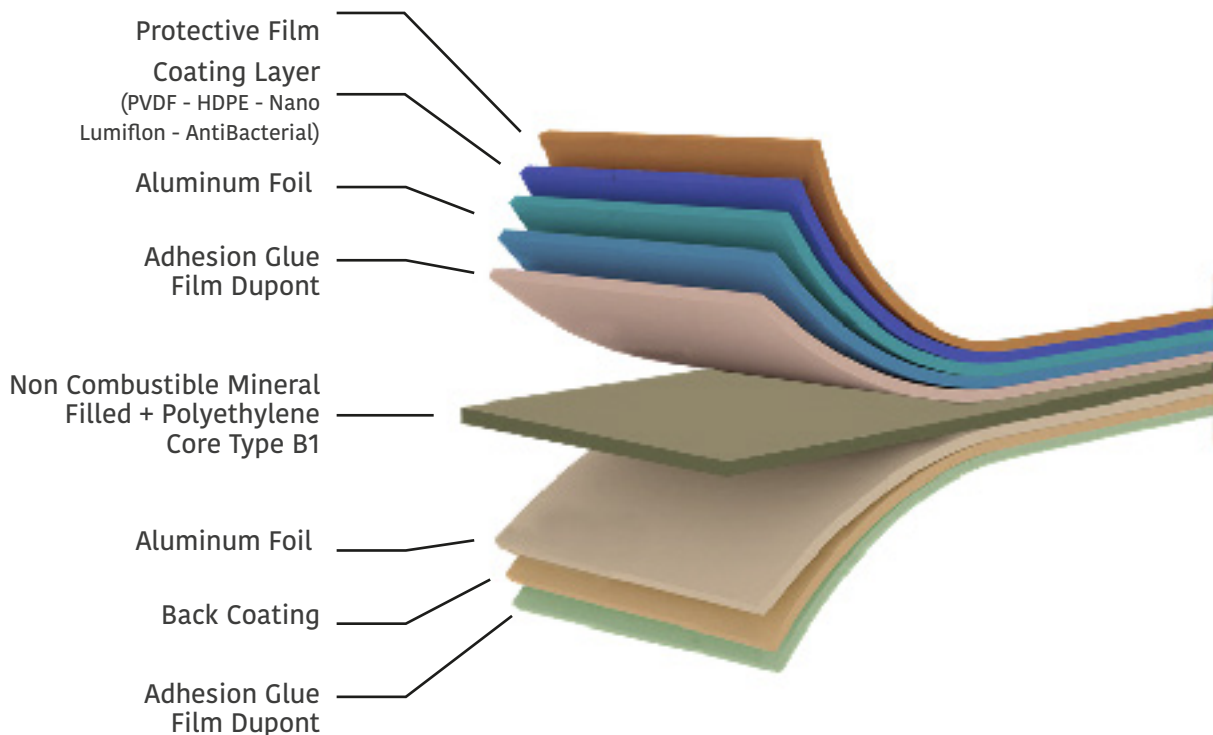
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## Product Composition

Two sheets of Aluminum Alloy 5005/3003 Series with 0.40 mm thickness on top (Coated with PVDF Paint) & Bottom (Primer coated) are sandwiched with FR minerals as a core material formed in continuous co-extrusion process with adhesivrs. The core material is free of voids and air spaces and does not contain foamed insulation materials.

Total Thick 4mm	Aluminium Thick	Kg/m <sup>2</sup>
<b>FR-B1</b>	0.4 mm	7.5 / kg
<b>FR-B2</b>	0.5 mm	8.1 / kg



## Product Composition

Product	Total Panel Thick (mm)	Components Thickness (mm)			Aluminium Grade	Core Mterial
		Top Alum Skin	Core FR	Bottom Alum Skin		
<b>Egypt Africa B1 Plus</b>	4	PVDF Coated 0.40 mm	3.20 mm	Polyester Coated 0.40 mm	Alloy 5005/3003 series	FR Mineral Core

## Product Dimension

Egypt Africa FR B1 Plus is available in various dimension however, standard panel size is 4mm \* 1250mm \* 5800mm

Other available sizes are as follows:

Dimension	Unit	Standard	Non Standard
			1275/1500/1570mm
<b>Length</b>	mm	5800	2440mm, 3660mm 4200mm
<b>Thickness</b>	mm	4	3,5 and 6

## Tolerances

Dimensional / Standard Size (Rounded).

Thickness: 4 mm

Width: 0.20 mm

Length: +2.0 mm

Panel Bow: Maximum %0.80 any 1828 mm(720)

Squarness: 3 mm

\* Maximum deviation from panel flatness shall 1/8" in 5'0" on panel in any direction for assembled units. (Non-accumulative - No Oil Canning ).

\* Panel Dimension: Field fabrication shall be allowed where necessasary, but shall be kept to an absolute minimum. All fabrication shall be done under controlled shop conditions when possible.

\* Panel lines, breaks, and angles shall be sharp, and surfaces free from wrap & buckle.



## Product performance (physical Properties)

### **Egypt Africa Integrity**

Egypt Africa 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: 145.98 N mm/mm (32.5 in lb/in) as manufactured.

## Physical Properties

Name	Unit	Thickness	
		4 mm	6 mm
<b>Density</b>	g/cm <sup>3</sup>	1.90	1.80
<b>Weight</b>	Kg/m <sup>2</sup>	7.5	10.75
<b>Thermal expansion</b> (at 100° C)	6-10/°C	24	24
<b>Thermo-conduction</b> (U-Value)	W/mk	0.40 to 0.43	
<b>Deformation temperature</b>	°C	115	
<b>Sound isolation</b> (100N3200HZ)	dB	26	27



## Comparison with other building materials

Physical Properties	Egypt Africa A2-FR	AL	FE	S.Steel	Concrete	Glass	Acrylic Sheet	Gypsum
Specific Gravity	1.75 - 1.85	2.71	7.9	7.9	0	2.5	1.2	0.87
Linier thermal Expansion (1m / 50°C)	1.1 mm	1.1 mm	0.6 mm	0.8 mm	0.62 mm	0.50 mm	3.6 mm	0
Thermal Conductivity W/ (m.K)	0.4 - 0.49	210	45	16	1.60	1	0	0.04

## Comparison of weight & rigidity

Egypt Africa FR B1 Plus Specific Gravity: 1.9			Aluminum Specific Gravity: 2.70			Stainless Steel 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)	Weight Ratio %
	4mm	7.8	3.30	8.7	61	2.3	18.8	29
<b>Egypt Africa</b>	6mm	10.5	4.50	12.2	61	3.2	25.1	29

## Deflection Temperature

Egypt Africa B1 FR Plus is having an approximate deflection temperature of 110°C. This characteristic proves the property of panel to resist boiling water. The Egypt Africa B1 FR Plus has temperature stability of -400C to + 800C 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

Egypt Africa B1 FR Plus has best vibration damping effect that absorbs mechanical energy arises out of vibration to convert it into thermal energy.





## Mechanical Properties

### Mechanical Properties of Aluminum Skin

We are using Alloys Series from 5005 - 3003 and temper H24

Mechanical Property	Unit	Aluminium AA3003-H18
%0.2 Proof Stress	MPa	152
Flexural Elasticity	GPa	70

## Mechanical Properties of Egpyy Africa B1 FR Plus

Mechanical Property	Unit	Egypt Africa B1 FR Plus	
		4 mm	6 mm
Tensile Strength	MPa	50	30
%0.2 Proof Stress	MPa	45	27
Elongation	%	7.2	5.1
Flexural Elasticity - E	GPa	40	29.5
Flexural Rigidity - E x I	kNmm <sup>2</sup> /mm	138	348
Punching Shear Strength	N/mm <sup>2</sup>	32.5	21

## Bending Limit

Egypt Africa A2 - 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	Egypt Africa B1 FR Plus
4mm	100mm
6mm	120mm



## Thermal Conductivity

Compared to solid materials Egypt Africa A2-FR has a lower thermal conductivity the table below shows the thermal conductivity comparison of different materials.

Material	Thermal Conductivity (W/m K)
<b>4mm Egypt Africa B1-FR Plus</b>	0.42
<b>6mm Egypt Africa B1-FR Plus</b>	0.41
<b>Solid Aluminum</b>	204
<b>Steel</b>	50.1
<b>Polyurethane</b>	0.01
<b>Glass Wood</b>	0.03
<b>Brick</b>	0.27
<b>Concrete</b>	0.82
<b>Gypsum Board</b>	0.12

## Heat Transmission

Egypt Africa B1 FR Plus reduces the Heat transfer from the outer air to the inner air. The air gap between the Panel and the wall increases the thermal insulation. The heat transmission coefficient (U-Value) 4mm ACP fixed wall system is given below.

## U Value

### Thermal Properties of Egypt Africa, U Value

Panel Thickness	Thermal Resistance 1/L.R (m <sup>2</sup> k/w)	Heat Transmittance Coefficient U value (W/m <sup>2</sup> k)
<b>3mm</b>	0.0069	5.65
<b>4mm</b>	0.0103	5.54
<b>6mm</b>	0.0172	5.34

Thermal Conductivity for (Egypt Africa) The Core is the determining Component  
 Core Material  $L_{PE}=0.29\text{W/mk}$  Aluminum  $L_{AL}=200\text{W/mk}$



## Coating Finishes

Aluminium Coil Alloy (5005/3003 Series) coated with **KYNAR®** 500 based Polyvinylidene Fluoride PVDF utilizing with minimum (%70 resin) Cooperate with (Becker`s) French Coating. 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 in conformance with the following general requirements of AAMA 620.

## Nano-PVDF Aluminium Composite Panel

Egypt Africa Nano-PvDF aluminium composite panel is anti-graffiti and self-cleaning. It is composed of core sandwiched between two 0.5mm aluminium skins. Coming with hydrophobic and lyophobic surface, the Nano-Pvdf ACP features good water and dirt resistance. The protected object stays clean much longer and can be easily cleaned with pure water. Egypt Africa ACP has high water repellence and the dirt in its surface can be easily cleaned away by a heavy rain.

### **Benefits of Egypt Africa Nano PVDF composite panel**

- Excellent easy-cleaning
- Anti Bacterial surface.
- Pollution Resistance.
- Oil resistance.
- Good Friction Resistance.
- Strong Acid & Alkali Resistance.
- Outstanding weather resistance.

## Color

Generally, we are manufacturing ACP with various options for color coating basically we have two different types of colors such as Solid & Metallic Colors, Natural Finishes (Stone - Timber) and Sparkling Colors Standards color as selected by the owner / architect / engineer and Custom colors as per customer requirement

## Panel Core

Egypt Africa B1 FR Plus Core is a fire safe material passed 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.



## Panel Strength

Egypt Africa B1 FR Plus 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 5005/3003 series for Egypt Africa A2-FR, Aluminum skins 2% proof stress is 152 MPa and suitable where the wind speed is 50 m/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 0.5% of supporting intervals.

## Resistance to natural forces

### **Lighting**

If a lightning strikes, Egypt Africa the electricity will be discharged to the earth through the substructure. Since the panel is connected to the earth the sub structure.

## Product warranty

Egypt Africa B1 FR Plus Aluminum Composite panels manufactured by Egypt Africa Group. 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 Orient and will be endorsed by the regional agents or the company itself.

