



Egypt Africa

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

Aluminum composite panels made by Egypt Africa either have an LDPE core or an FR core (mineral core) sandwiched between two coils of solid aluminum.

LDPE (low-density polyethylene) is a thermoplastic material that belongs to the family of polyolefins. They are formed by compressing monomer ethylene gas in an autoclave or tubular reactor to link the monomers into polymer chains.

LDPE

المواصفات الفنية لمنتج
إيجيت افريقيا حشوة داخلية

Technical Data Sheet

Egypt Africa

LDPE

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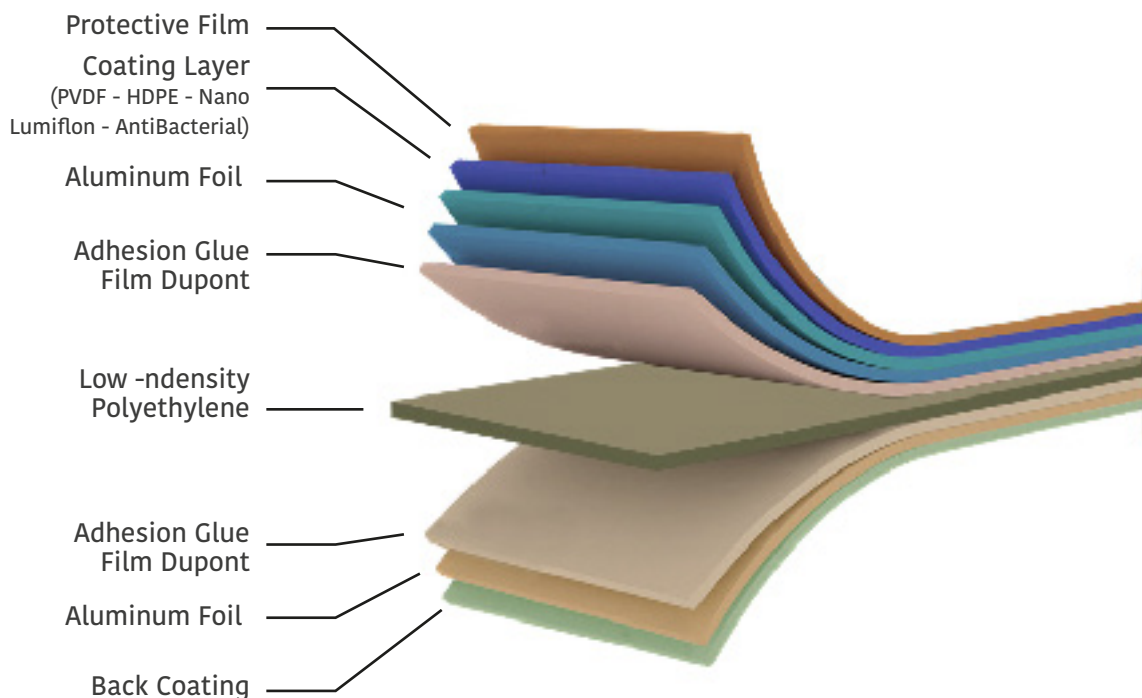
Product Composition

Exterior grade panel must be exact 4 mm thick composed of a low-density polythethylene core sandwiched between two sheets of Aluminum of 0.40mm, thickness as seen below:

Exterior / Face panelnis Aluminum nSheet Coated with PVDF interior / Rear siode of panel is coated with 0.5 to 7 - micron Polyester Coated

Total Thick 4mm	Aluminium Thick	Kg/m ²
LLD	0.4 mm	5.5 / kg
LLD	0.5 mm	6.1 / kg

Typical composition of aluminum composite panel (Diagramatic Represntation)



Product Composition

Product	Total Panel Thick (mm)	Components Thickness (mm)			Aluminum Grade	Core Mterial
		Top Alum Skin	Core FR	Bottom Alum Skin		
Egypt	4	PVDF Coated	3.0	Polyester Coated	Alloy	Low Density
Africa	5	0.40 mm	3.20 mm	0.40 mm	5005/3003	Polyethylene
LDPE	6	0.50 mm		0.50 mm	series	Core

Product Dimension

Egypt Africa LDPE is available in various dimension however, standard panel size is 4mm * 1250mm * 5800mm.

Dimension	Unit	Standard	Non Standard
Width	mm	1250	1000/1500/1575mm
Length	mm	5800	2440mm, 3660mm and 4200mm Any length Available
Thickness	mm	4	3,5 and 6

Tolerances

Dimensional / Standard Size (Rounded).

Thickness: 4 mm - 0.20 mm

Width: +2.0 mm

Length: 0.20 mm

Panel Bow: Maximum %0.8 any 1828 mm 72Q panel dimension.

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		
		3 mm	4 mm	6 mm
Density	g/cm ³	1.52	1.38	1.24
Weight	Kg/m ²	4.55	5.6	7.34
Thermal expansion (at 100° C)	6-10/°C	15	26	24
Thermo-conduction (U-Value)	W/mk	0.40 to 0.43		
Deformation temperature	°C	115		
Sound isolation (100N3200HZ)	dB	26	26	27



Comparison with other building materials

Physical Properties	Egypt Africa A2-FR	AL	FE	S.Steel	Concrete	Glass	Acrylic Sheet	Gypsum
Specific Gravity	1.2 - 1.35	2.71	7.9	7.9	0	2.5	1.2	0.87
Linear thermal Expansion (1m / 50°C)	1.1 mm	1.1 mm	0.6 mm	0.9 mm	0.62 mm	0.50 mm	3.5 mm	0
Thermal Conductivity W/ (m.K)	0.4 - 0.49	210	45	16	1.61	1	0	0.04

Comparison of weight & rigidity

Egypt Africa FR B1 Plus Specific Gravity: 1.9			Aluminium Specific Gravity: 2.70			Stainless Steel Specific Gravity 7.89		
	Thick (mm)	Weight (Kg/m ²)	Thick (mm)	Weight (Kg/m ²)	Weight Ratio %	Thick (mm)	Weight (Kg)	Weight Ratio %
	4mm	5.50	3.30	8.8	61	2.3	18.8	29
Egypt Africa	6mm	7.34	4.50	12.2	61	3.2	25.1	29

Deflection Temperature

Egypt Africa LDPE is having an approximate deflection temperature of 110°C. This characteristic proves the property of panel to resist boiling water. The Egypt Africa LDPE has temperature stability of -40 C to Heating less than 30 Minutes Max temperature 90°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

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

Mechanical Properties

Mechanical Properties of Aluminium Skin

We are using Alloys Series fro 5005 / 3003 and temper H24/18

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

Mechanical Properties of Egpyy Africa B1 FR Plus

Egypt Africa LDPE having the below mechanical properties as average:

Mechanical Property	Unit	Egypt Africa B1 FR Plus	
		4 mm	6 mm
Tensile Strength	MPa	43	34
%0.2 Proof Stress	MPa	37	30
Elongation	%	14	16
Flexural Elasticity - E	GPa	40.2	29
Flexural Rigidity - E x 1	kNmm ² /mm	138	348
Punching Shear Strength	N/mm ²	25	21

Bending Limit

Egypt Africa LDPE 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 A2-FR
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)
4mm Egypt Africa A2-FR	0.45
Solid Aluminium	205
Steel	50.2
Polyurethane	0.02
Glass Wood	0.04
Brick	0.28
Concrete	0.80
Gypsum Board	0.13
Air at 0°C	0.024

Heat Transmission

Egypt Africa LDPE 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.

Type of Panel Cladding	100 mm Air Gap 115 mm Brick Wall	75 mm Air Gap 25 mm Rock Wool 115 mm Brick Wall
Techno Bond LDPE	MPa	152



Coating Finishes

Aluminium Coil Alloy (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 & Polyvinlidene fluoride color in conformance with the following general requirements of AAMA 620.

Nano-PVDF Aluminium Composite Panel

Egypt Africa Nano-PvDF aluminum composite panel is anti-graffiti and self-cleaning. It is composed of core sandwiched between two 0.5mm aluminum 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

Egypt Africa nano-PVDF panel has the following advantages.

- Excellent easy-cleaning
- Anti Bacterial surface.
- Pollution Resistance.
- Oil resistance
- Good Friction Resistance

Color

Generally, we are manufacturing Egypt Africa A2-FR with various options for color coating. Basically we have two different types of colors such as Solid & Metallic Colors, Natural Finishes (Stones & Timber) and Sparkling Colors. Standard color as selected by the owner / Architect / Engineer and Custom colors as per customer requirement.

Panel Core

Egypt Africa LDPE is one-time recycled Low-Density Poly Ethylene offers better melt flow characteristics and good flexibility than recycled HOPE. This gives more flatness and fabrication easiness to the panel. We also add Calcium Carbonate CaCo3 to give extra-ordinary flexibility to the core material and it makes core material UN-Breakable



Panel Strength

Egypt Africa LDPE 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 aluminium 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 LDPE, 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 LDPE 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.

U Value

Thermal Properties of Egypt Africa, U Value

Panel Thickness	Thermal Resistance 1/L.R (m ² k/w)	Heat Transmittance Coefficient U value (W/m ² k)
3mm	0.0069	565
4mm	0.0103	554
6mm	0.0172	534

Thermal Conductivity Egypt Africa The Core is the determining Component
Core Matenal L.0.29w/mk Aluminium L.200W/mk



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