NEW

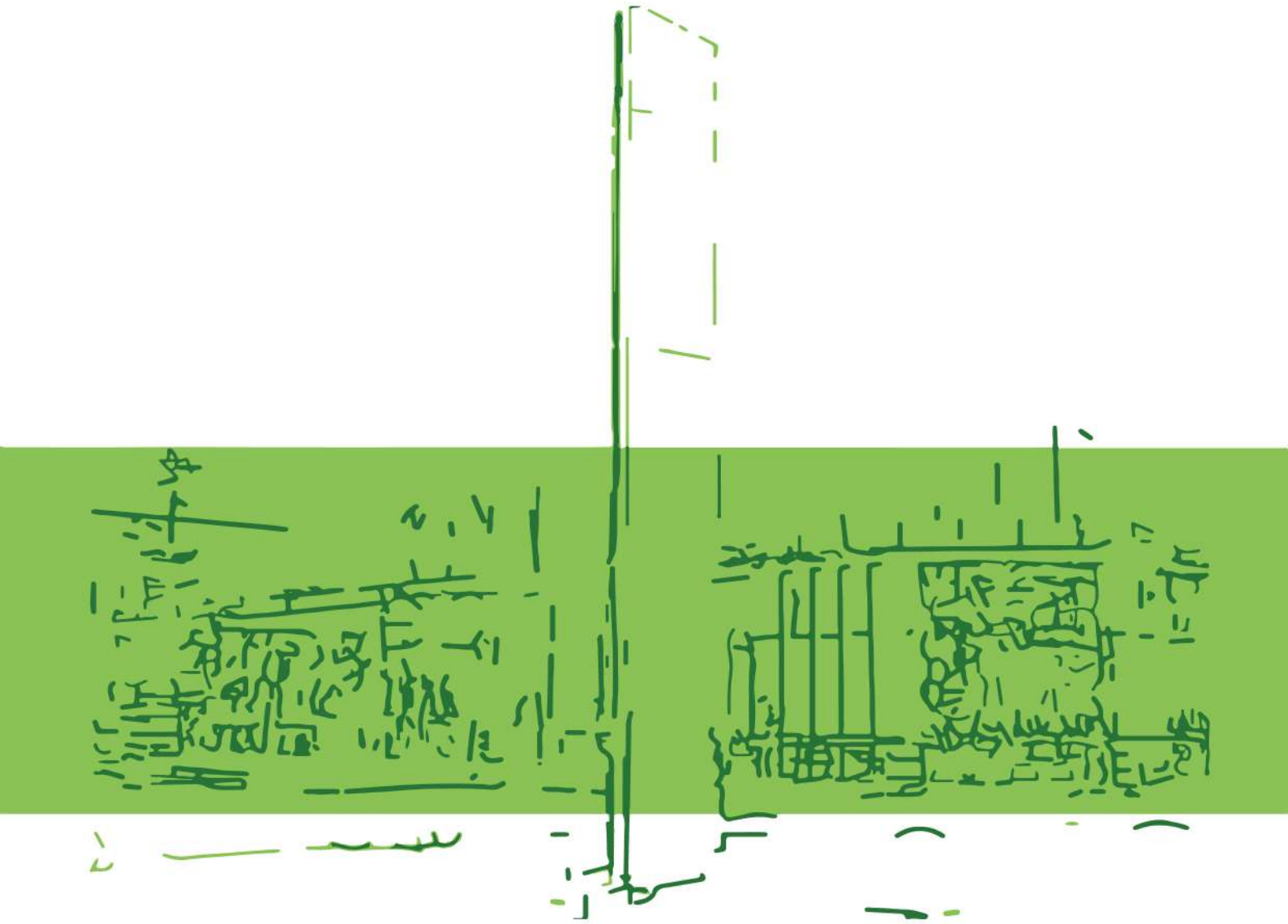
TECHNO BOND
شركة ألواح الخليج
"تكنوبوند"

What is Techno Bond ?

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

Our company has continued to invest in cutting edge technology, offering an outstanding performance, durability and costly wise products over time. Techno Bond adequalety meets with all the official standards and specific criteria, naturally making it one of the most leading competitors in the market today.

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



TECHNO BOND
شركة ألواح الخليج
"تكنوبوند"

المواصفات الفنية لمنتج
تكنوبوند المقاوم للحريق
B1 Plus

Talents Hand in Hand Build Techno Bond Family
Friends Heart to Heart to Creat Incomparable Glory

مصنع ألواح الخليج تكنوبوند
أكبر مصنع لإنتاج الواح الكلادينج في الشرق الأوسط وإفريقيا

Aluminium Composite Panels-Techno Bond

TECHNO BOND
شركة ألواح الخليج
"تكنوبوند"

Technical Data Sheet
Techno Bond

FR – B1 PLUS

INDEX

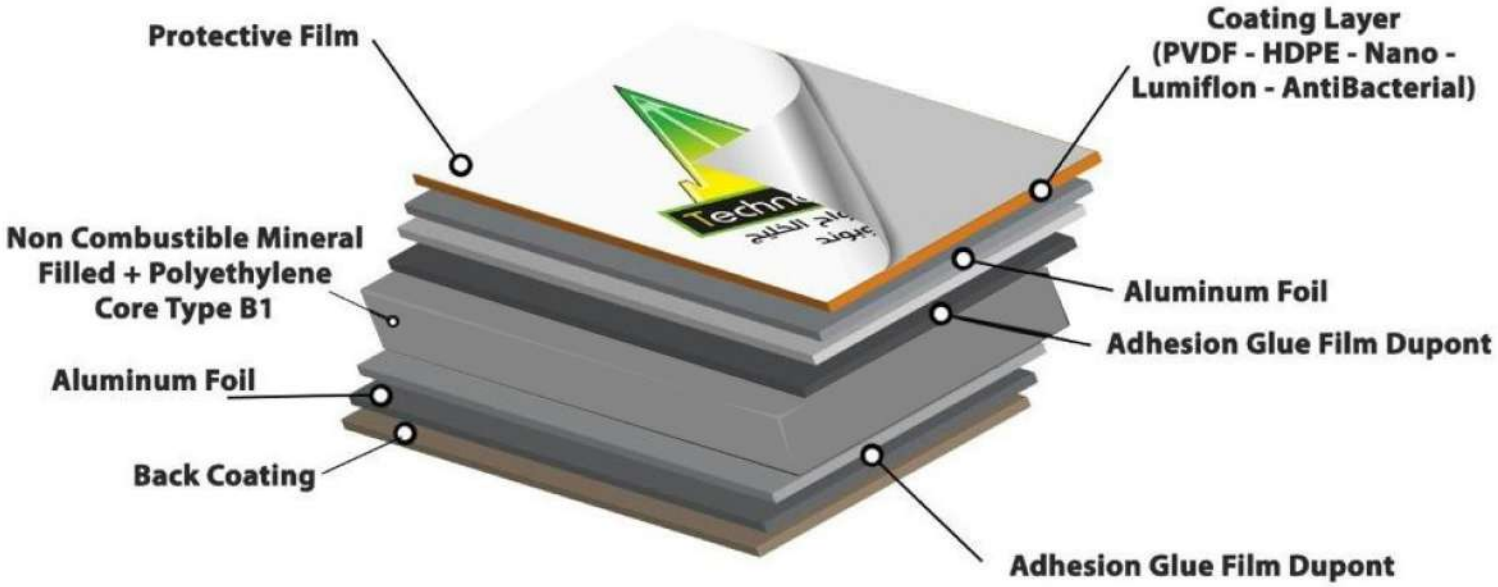
Product Composition
Standard Composition
Product Performance Physical Properties
Physical Properties
Mechanical Properties
Bending Limit
Thermal Conductivity
Heat Transmission
U Value
Coating Finishes
Panel Core
Panel Strength
Joining Holes, I Bolts & Nuts
Product Warranty

PRODUCT COMPOSITION

Two sheets of Aluminum Alloy 3003 /5005 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 a continuous co-extrusion process with adhesives. The core material is free of voids and air spaces and does not contain foamed insulation materials.

Total Thick 4mm	Aluminum Thick	Kg/m2
FR-B1	0.4 mm	7.5 / kg
FR-B1	0.5 mm	8.2 / kg

Techno Bond FR B1



STANDARD COMPOSITION

Product	Total Panel Thick (mm)	Component Thickness(mm)			Aluminum Grade	Core Material
		Top Alum Skin	Core FR	Bottom Alum Skin		
Techno Bond Fr B1 Plus	4	PVDF Coated 0.40mm	3.20 mm	Polyester Coated 040mm	Alloy 3003/5005 series	FR Mineral Core

PRODUCT DIMENSION

Techno Bond FR B1 Plus is available in various dimensions however our standard panel size is 4mm X 1250mm X 5800mm

Other available sizes are as follows:

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

TOLERENCES

Dimensional /Standard Size (Rounded)

Thickness: 4mm

Length: 0.20 mm

Width: + 2.0 mm

Panel Bow: Maximum 0.8% of any 1828 mm (720)

Squareness : 3mm

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

•Panel Dimensions: Field fabrication shall be allowed where necessary, 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, true, and surfaces free from warp and buckle.

PRODUCT PERFORMANCE (PHYSICAL PROPERTIES)

Techno Bond Integrity

Techno 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: 145.96 N mm/mm (32.8 in lb/in) as manufactured

PHYSICAL PROPERTIES

Name	Unit	Thickness	
		4mm	6mm
Density	g/cm3	1.89	1.80
Weight	kg/m2	7.5	10.85
Thermal expansion (at 100 °C)	10-6/oC	24	24
Thermo-conduction (U-Value)	W/mK	0.40 to 0.43	
Deformation temperature	oC	115	
Sound isolation (100N3200HZ)	dB	26	27

COMPARISON WITH OTHER BUILDING MATERIALS

Physical Properties	Techno Bond FR B1 Plus	AL	FE	S. Steel	Concrete	Glass	Acrylic Sheet	Gypsum
Specific Gravity	1.8-1.89	2.71	7.9	7.9	0	2.5	1.2	0.86
Linier Thermal Expansion (1m /50°C)	1.2 mm	1.2 mm	0.6mm	0.9mm	0.63 mm	0.50 mm	3.5 mm	0
Thermal Conductivity W/ (m.K)	0.4 - 0.5	210	45	17	1.62	1	0	0.04

COMPARISON OF WEIGHT & RIGIDITY

	Techno Bond FR B1 Plus Specific Gravity: 1.9		ALUMINUM Specific Gravity: 2. 71			Stainless Steel Specific Gravity 7.89		
	Thick (mm)	Weight (Kg/m2)	Thick (mm)	Weight (Kg/m2)	Weight Ratio %	Thick (mm)	Weight (Kg)	Weight Ratio %
Techno Bond	4mm	7.8	3.30	8.9	62	2.4	18.9	29
	6mm	10.5	4.50	12.2	61	3.2	25.2	29

DEFLECTION TEMPERATURE

Techno Bond FR B1 Plus is having an approximate Deflection Temperature of ll0°C. This characteristic proves the property of panel to resist boiling water. The Techno Bond FR has a 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

Techno Bond FR B1 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 3003 - 5005 and temper H24

MECHANICAL PROPERTY	UNIT	ALUMINUM AA3003-H18
0.2% Proof stress	MPa	152
Flexural Elasticity	GPa	70

Mechanical Properties of Techno Bond FR B1 Plus

Techno Bond FR is having the below mechanical properties as average:

Mechanical Property	Unit	Techno Bond FR B1 Plus	
		4mm	6mm
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 1	kNmm2/mm	138	348
Punching Shear Strength	N/mm2	32.5	21

BENDING LIMIT

We can bend the Techno Bond FR B1 Plus in a Press Break or 3roll Bending machines. Normally the smallest radius, which we can apply to bend the panel without wrinkles at the radial surface of panel, is termed as the .bend radius. In 3roll machine, the bending diameter depends on the roll diameter, length and type of machine.

Smallest bending radius (Parallel in Press Break Machine)

Thickness	Techno Bond FR B1 Plus
4mm	100mm
6mm	120mm

THERMAL CONDUCTIVITY

Compared to solid materials Techno Bond FRB1 Plus has a lower thermal conductivity the table below shows the thermal conductivity comparison of different materials.

MATERIAL	Thermal Conductivity (WI m K)
4mm Techno Bond FR B1 Plus	0.43
6mm Techno Bond FR B1 Plus	0.40
Solid Aluminum	205
Steel	50.2
Polyurethane	0.02
Glass Wool	0.04

Brick	**0.28**
Concrete	**0.80**
Gypsum Board	**0.13**

HEAT TRANSMISSION

Techno Bond FR B1 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.

Type of panel Cladding	100 mm Air Gap 115mm Brick wall	75 mm Air Gap 25mm Rock wool 115mm brick wall
4mm Techno Bond FR B1 Plus	**1.5O W/m2K**	**0.94 W/m2K**
5mm Techno Bond FR B1 Plus	**1.32 W/m2K**	**0.79W/m2K**

U Value

Thermal Properties of Techno Bond®
U Value

Panel Thickness	Thermal Resistance 1/L = R (m2K/W)	Heat Transmittance Coefficient U value (W/m2K)
3mm	0.0069	5.65
4mm	0.0103	5.54
6mm	0.0172	5.34

Thermal Conductivity (for Techno Bond) The Core is the determining Component

Core Material l_{PE} = 0.29W/mK Aluminium l_{AL} = 200W/mK

COATING FINISHES

Aluminum Coil Alloy (3003/ 5005 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 Three (3) coat system consisting Primer, Color and Clear Top coat. Normal RAL colors usually have Two (2) coat system composed of inhibitive. Primer and Color Coating conformance with the following general requirements of AAMA 620.

Nano-PVDF Aluminium Composite Panel

TECHNO BOND Nano-PVDF aluminium composite panel is anti-graffiti and self-cleaning. It is composed of a 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.
Techno Bond ACP has high water repellence and the dirt on its surface can be easily cleaned away by a heavy rain.
Benefits of TECHNO BOND Nano PVDF composite panel
TECHNO BOND nano-PVDF panel has the following advantages.
- 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 of color coating basically we have Four different types of colors such as: Solid / Metallic Colors, Natural Finishes (Stone &Timber) and Sparkling Colors Standard color as selected by the owner / architect /engineer and Custom colors as per customer .requirement

PANEL CORE

Techno Bond FR B1 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

Techno Bond FR B1 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 3003/5005 series for our Techno Bond FR Aluminum skins 2% proof stress is 152MPa 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 the 0.5% of supporting intervals.

RESISTANCE TO NATURAL FORCES

Lightning

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

PRODUCT WARRANTY

Techno Bond brand Aluminum Composite Panels supplied by Alwah Al Khaleej Co Will be warranted for a period of 20 Years from the date of supply, as per our standard product warranty Policy from Alwah Al Khaleej Co. Formal Warranty documentation will be issued in the name of Client .and will be endorsed by the regional agents or the company itself.

CATEGORY	TEST STANDERD	TEST PROCEDURE	REQUIREMENT	4MM	6MM	RESULT
MECHANICAL TEST	CALIBRATED CALIPER	THICKNESS OF THE PANEL	±0.2	4.092mm	6.182mm	PASSED
	CALIBRATED WEIGHINGDEVICE	WEIGHT OF THE PANEL	≥7.5 kg/m² for 4mm ≥10.85 kg/m² for 6mm	7.5Kg/m²	10.8Kg/m²	PASSED
	ASTM C273	Shear Strength	≥3.2 Mpa	3.49	4.35	PASSED
	ASTM01781	PEEL OFF TEST	>10 KG/25mm	17.3Kg/25mm		PASSED
	ASTM C 481 (CYCLE A)	WEATHERING RESISTANCE	A SHEAR STRENGHT NO EFFECTS WHEN TEST AS PSER ASTM C 273 B. FILM ADHESION NO EFFECTS WHEN TEST AS PER AAMA 2605(CLAUSE7.4) C. IMPACT RESISTANCE NO EFFECTS WHEN TEST AS PER AAMA 2605(CLAUSE 7.5)	A. 3.45 MPA B. FILM ADHESION B1. DRY ADHESION- NO REMOVALOF FILM WAS OBSEVERVED B2.WET ADHESION- NO REMOVAL OF FILM OBSERVED B3. BOILING WATER- NO REMOVAL OF FILM OBSERVED C. IMPACT RESISTANCE- NO REMOVAL OF FILM OBSERVED		PASSED
	ASTM D 648	TEMPERATURE FOR THE THERMAL DEFORMATION	≥100°C	189.8°C	215.1°C	PASSED
	ASTM C 518	THERMAL CONDUCTIVITY	MEASURE VALUE	0.13W/mK	0.10W/mK	PASSED
COATING PERFORMANCE	AAMA 2605	CORROSION RESISTANCE	A. HUMIDITY RESISTANCE·NO FORMATION OF BLISTER TO EXTENT GREATERTHAN "FEW" BLISTERSIZE # AS SHOWN IN FIG 4 OF ASTD 714. B. SALT SPAY RESISTANCE: MINIMUM RATING OF 7 ON SCRIBE OR CUT EDGES.AND A MINIMUM BLISTER RATING OF 8 WITHIN THE TST SPECIMEN.FEILD IN ACCORDANCE WITH TABLE1 AND 20F AAMA2605	Humidity resistance: no formation of Blisters salt spray resistance a. Rating of 9 on scribed b. Ratings of 10 on unscribed	ON GOING	PASSED
	ASTM 1400	COATING THICKNESS	≥25 µm	30.1 µm		PASSED
	ASTM D968 METHOD A	ABRASION RESISTANCE	>50/mil	368.1 L/mils		PASSED
	ASTM D 3363	PENCIL HARDNESS	≥2H	>3H		
	AAMA 2605 (CLAUSE 7.4)	FILM ADHESION	NO LOSS OF ADHESION	NO PEELING OF FILM NOR BLISTERING ANYWHERE WAS OBSERVED		PASSED
FIRE TEST	AAMA 2605 CLAUSE 7.5	IMPACT RESISTANCE	NO REMOVALOF FILM SUBTRATE	NO REMOVAL OF FILME SUBTRATE		PASSED
	ASTM E 84	STANDARD TEST METHOD FOR SURFACE BUILDING CHARACTERISTICS OF BUILDING MATERIALS	CLASS 1 ORA: FLAME SPREADINDEX (FSI) 0-25; SMOKE-DEVELOPEDINDEX (SDI) 0 -450	FSI (15) SDI (30)	FSI (15) SDI (40)	PASSED
	ASTM D 1929-16	STANDARD TEST METHOD FOR DETERMINING IGNITION TEMPERATURE OF PLASTICS	WITH PASS CRITERIA MCM/ ACP SHALL HAVE SELF IGNITION TEMPERATURE OF NOT LESS THAN 343°C	SELF-IGNITION 896°F (480°C) FLASH IGNITION 896°F (480°C)	SELF-IGNITION 896°F (480°C) FLASH IGNITION 896°F (480°C)	PASSED
	NFPA 285	STANDARD FIRE TEST METHOD FOR EVALUATION OF FIRE PROPAGATION CHARACTERISTICS OF EXTERIOR NONLOAD BEARING WALL ASSEMBLIES CONTAINING COMBUSTIBLE COMPONENTS	FLAMESDID NOT REACH 10 FEET ABOVETHE WINDOW OPENING. FLAMESDID NOT REACHA LATERALDISTANCEOF 5FT FROM THE VERTICAL CENTERLINE. THERE WAS NO VISIBLE FLAMING IN THE SECONDSTORYTEST ROOM. Tc 11 and Tc 14 THRDUGH Tc 17 DID NOT EXCEED THE 1000°F LIMIT Tc 18 and Tc 18 DID NOT EXCEED THE 1000°F LIMIT. Tc28 and Tc31 THROUGH Tc 40 DID NOT EXCEED THE 1000°F LIMIT. Tc 49 THROUGH Tc 54 DID NOT EXCEED 500°F LIMIT ABOVE THE AMBIENT TEMPERATURE.	PASSED		PASSED

TECHNO BOND
شركة ألواح الخليج
"تكنوبوند"

Thank you for being part of Techno Bond Team

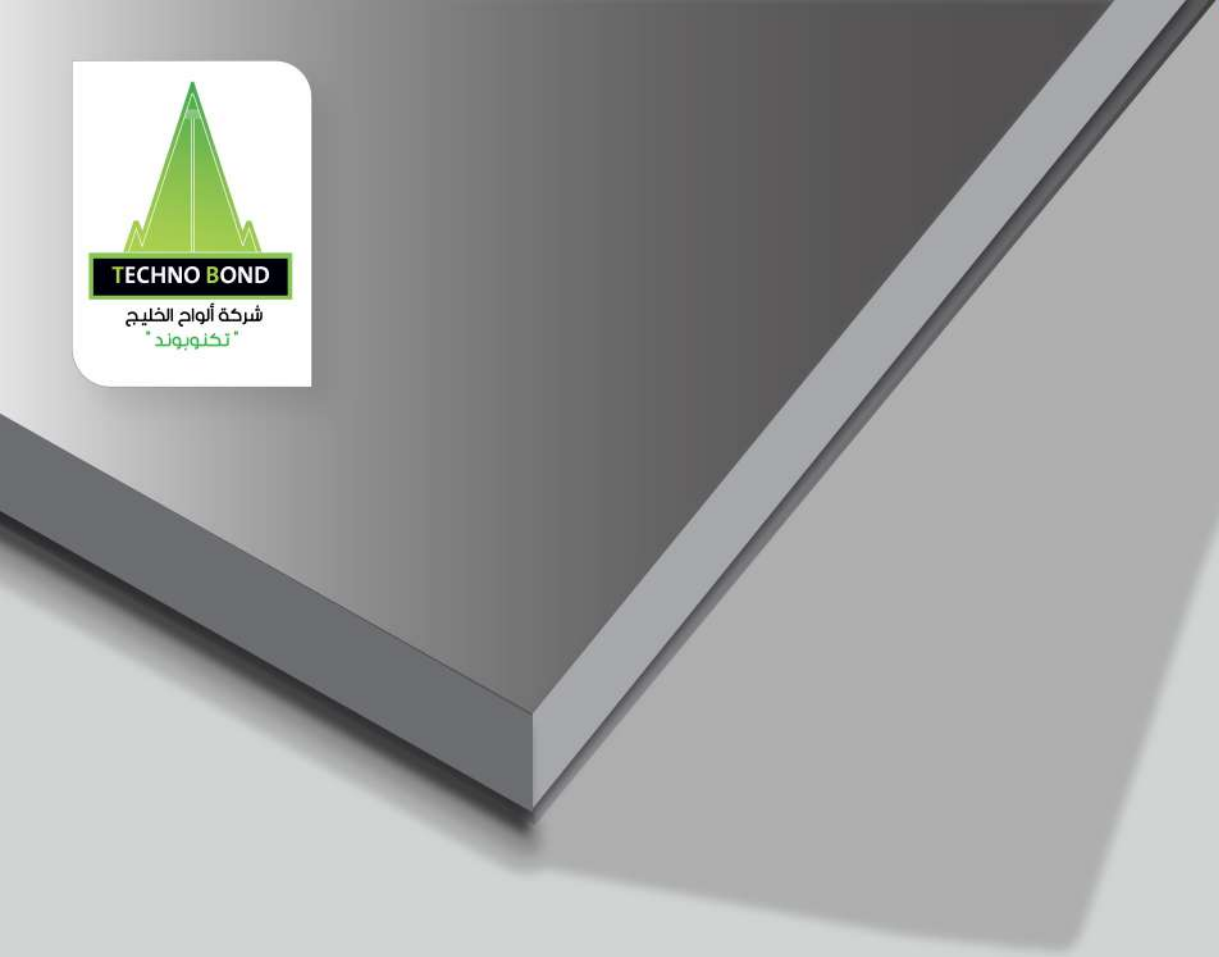
TECHNO BOND
شركة ألواح الخليج
"تكنوبوند"

KSA, Riyadh
+966 5000 143 00
info@techno-bond.com
www.techno-bond.com

Egypt, Cairo
+2011 000 57 000
info@techno-bond.com
www.techno-bond.com

TECHNO BOND
شركة ألواح الخليج
" تكنوبوند "

NEW



Techno Bond is the most widespread in the Arab and African world. And the largest factory for producing cladding panels in the Middle East and African. In addition to advanced production lines with a production capacity of 14.000.000 square meters annually, a product approved by all Governmental Authorities in the Kingdom of Saudi Arabia and other countries, and the most widespread in the Kingdom of Saudi Arabia .

The factory works around the clock to provide customers request in the fastest time . You are guaranteed for 20 years against manufacturing defects.

TECHNO BOND
شركة ألواح الخليج
" تكنوبوند "