



تكنوبوند .. قطاع الكلاسيك

Techno Bond

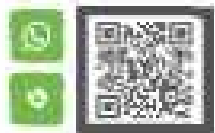
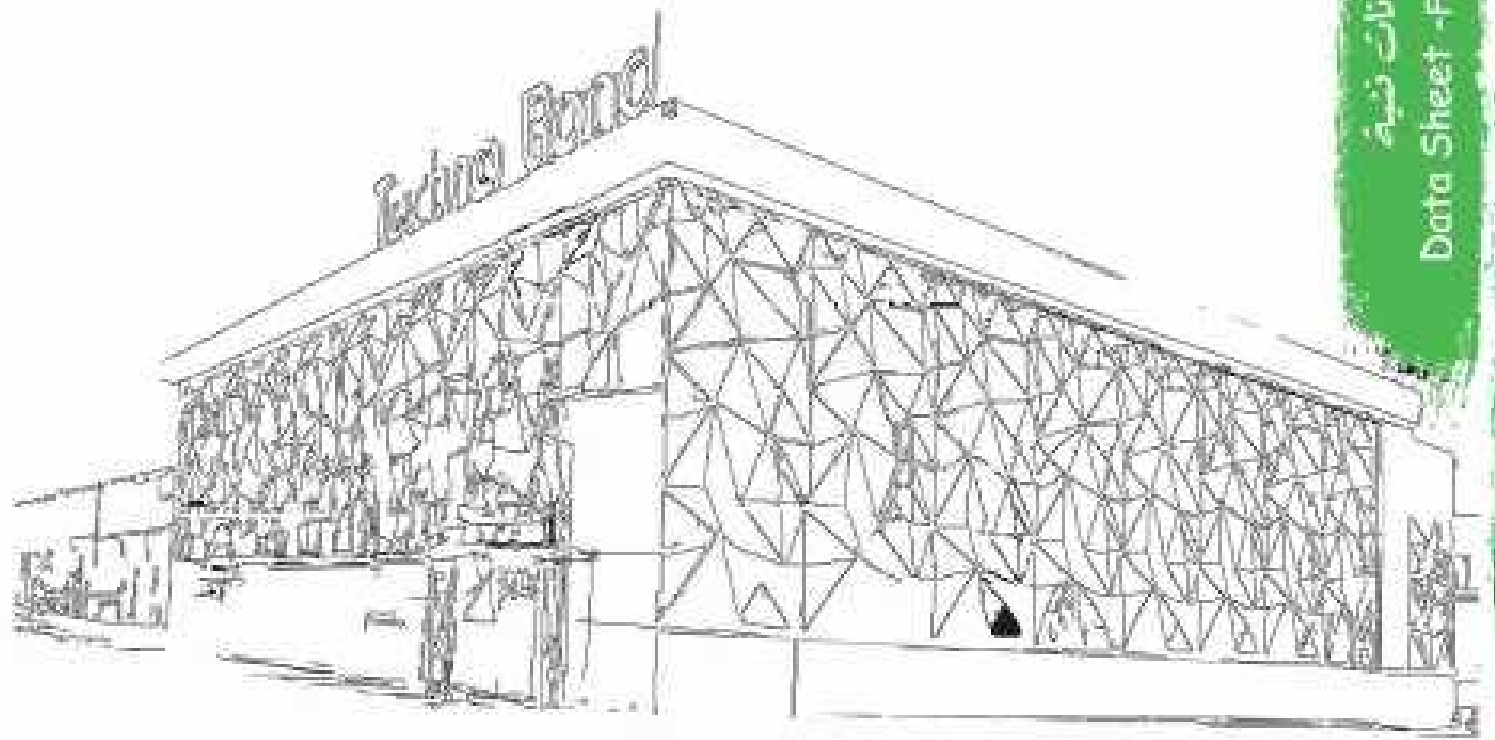
شركة ألواح الخليج

البيانات الفنية

تصنيف النوع المقاوم للحريق

FR2 = FR A2

بيانات فنية
Data Sheet - FR2-FRA2



Aluminium Composite Panels-Techno Bond

Techno Bond Copyright, Version 2026-2027



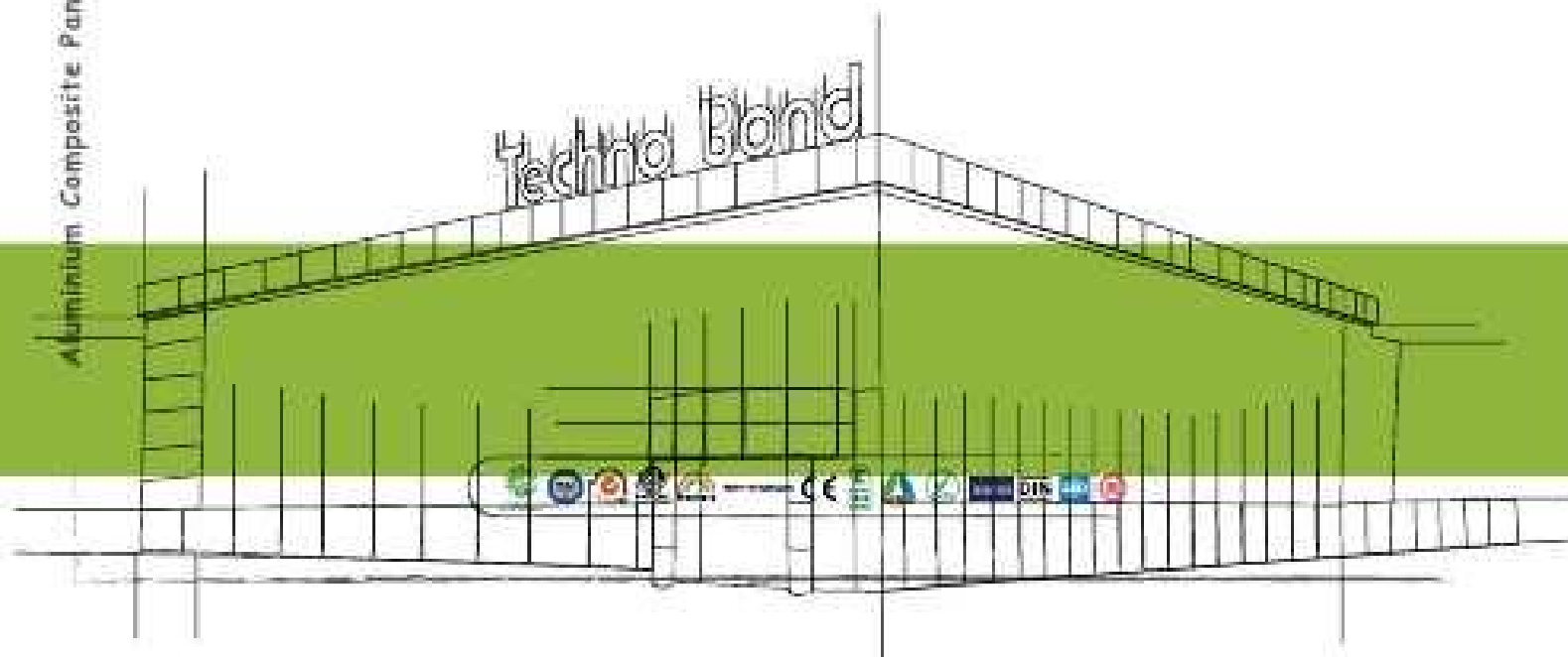
المواصفات الفنية لمنتج «تكنو بوند» المقاوم للحريق **A2**

Techno Bond is the most widespread in the Arab and African world the largest factory for producing cladding panels in the Middle East and Africa. In addition to advanced production lines with a production capacity of 7,000,000 square meters annually, a product approved by all government 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' requests in the fastest time. You are guaranteed for 20 years against manufacturing defects.

TECHNO BOND **Aluminium Composite Panels**

Technical Data Sheet
FR - A2

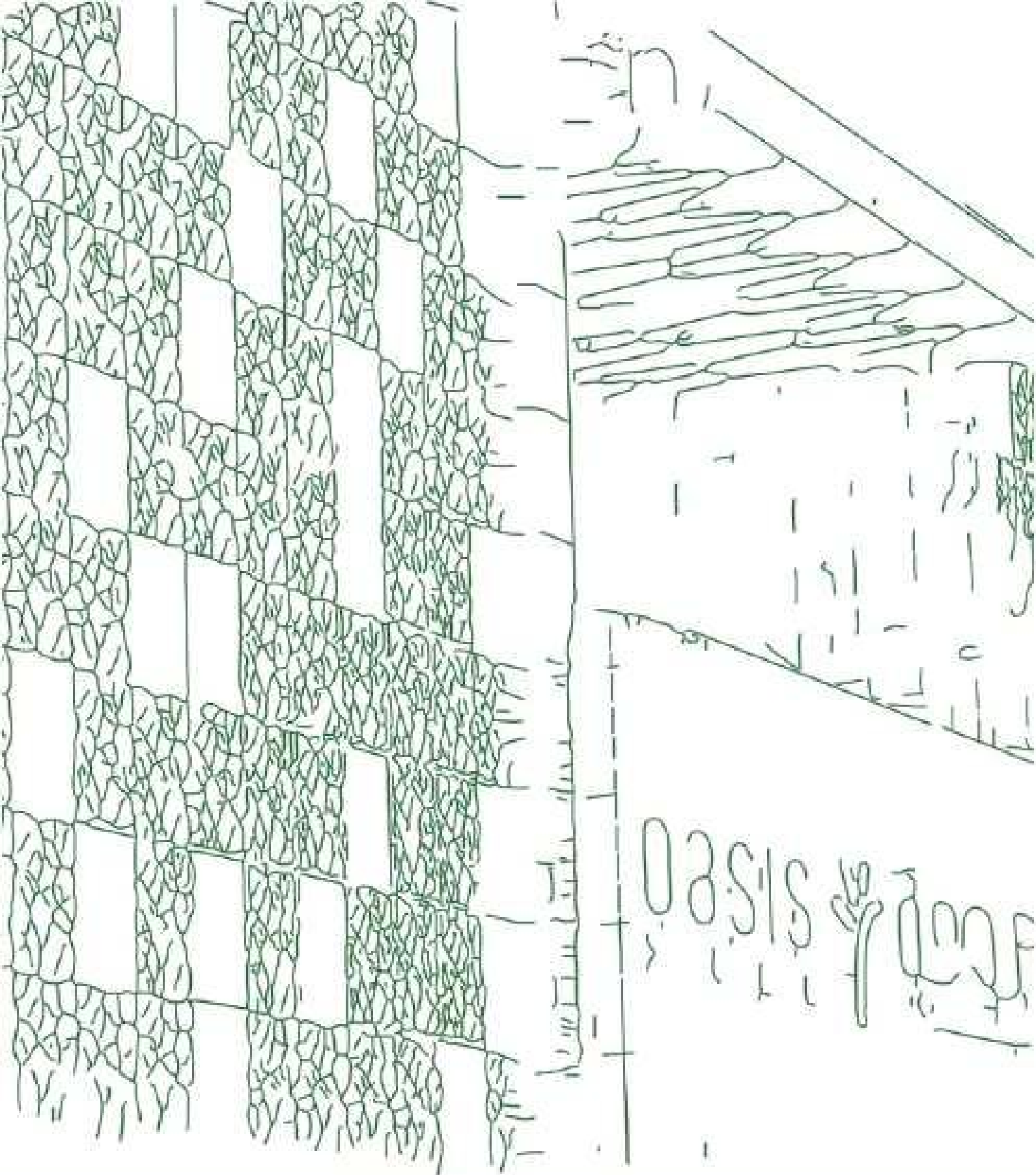
Aluminium Composite Panels - Techno Bond





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1.1.1

1.1.1

1 Techno Bond Product Composition

Techno Bond A2 offers one of the most reliable products in the market today. Two 0.4mm thickness sheets of aluminium alloy 3003/5005 on top (coated with PVDF) and bottom (Primer Paint) are sandwiched with FR non-combustible inorganic mineral core material. The core material is free of voids and air spaces, providing excellent corrosion resistance.

Techno Bond FRA2 Composition

TOP ALUMINUM SHEET

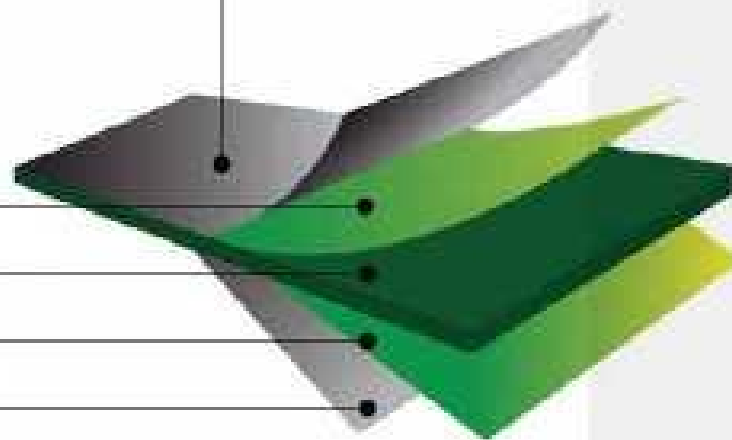
Protective Film
PVDF Coating
Primer

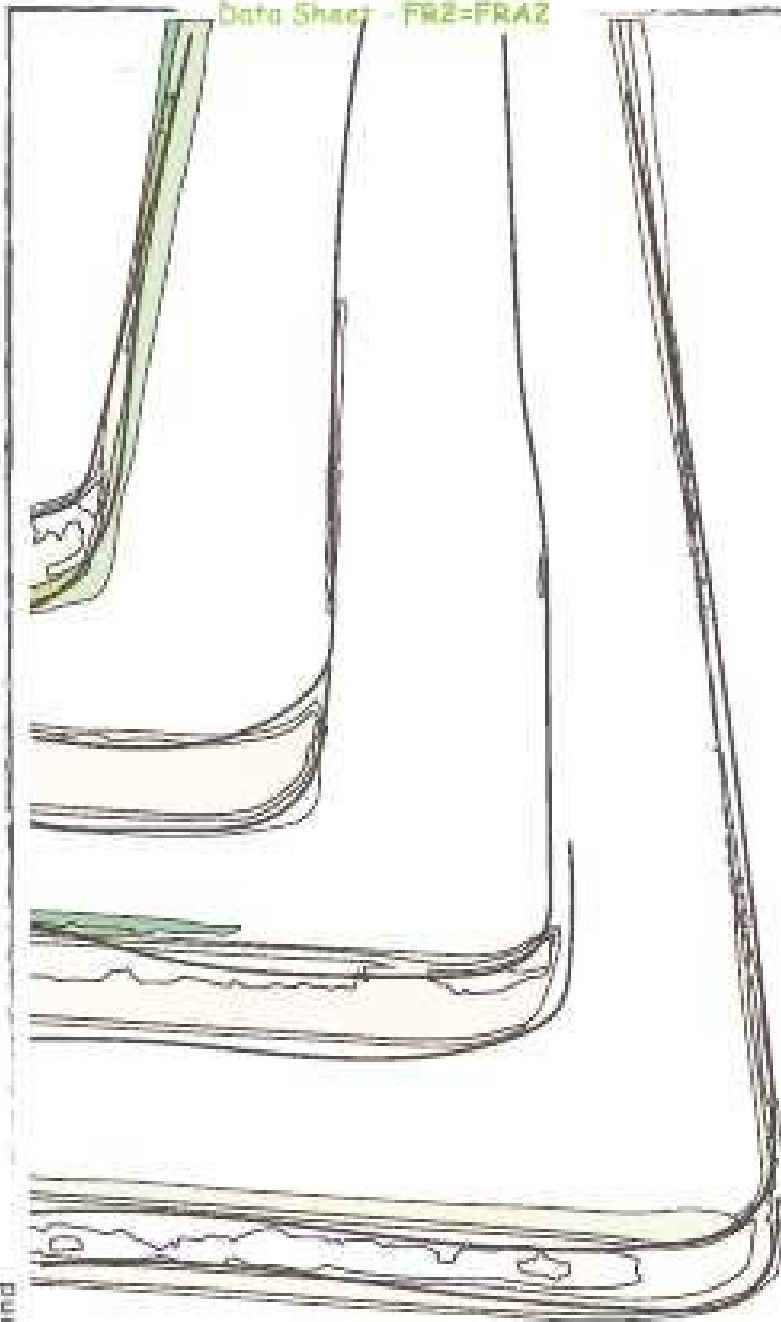
ADHESIVE

FILLED NON-COMBUSTIBLE MIN-
ERAL CORE TYPE (A2)

ADHESIVE

BOTTOM ALUMINUM
Protective Film
PVDF Coating
Primer





شركة ألواح الخليج

- Typical Composition of TECHNO BOND Products





2 Techno Bond Standard Composition

Thickness (tolerance ± 0.2 mm)	Standard width (tolerance ± 0.2 mm)	Bow tolerance
4 mm	1000, 1500, 1575mm	0.8% Of any 1828mm panel dimension
Skin Thickness	Length (tolerance ± 2.0 mm)	Squareness tolerance
0.4mm	2440, 3660, 4200mm	Max 5.0mm



ACP Panel Dimensions

Length
5800 (Standard)
2440 (Non Standard)
3660 (Non Standard)
4200 (Non Standard)

Width
1250 (Standard)
1000 (Non Standard)
1500 (Non Standard)
1575 (Non Standard)



ACP Panel Sizes



Panel Tolerances

• Physical Properties

Characteristics of Techno Bond A2

Description	Technobond A2		Unit	Method
Thickness	0.4	0.4	mm	Calliper
Weight	8-8.5	8.2-8.6	Kg/m ²	Calibrated weighing device
Density	1.95		Kg/m ³	Calculated Value
Specific gravity	1.9		-	Calculated Value
Surface spread of flame	Class 1		-	BS 476: Part 7: 1997
Adhesion	No Cracks		-	ISO 7438:2016

• Mechanical Properties

Mechanical Properties of the Aluminum Skin According to ASTM Standards

Description	Standard	Unit	Avg. Result
Skin Thickness	Calliper	mm	0.5
Alloy	ASTM B209M	.	3003 H26
Modulus of Elasticity	ASTM B209M	N/mm ²	69000
Yield Strength	ASTM B209M	N/mm ²	145
Tensile Strength	ASTM B209M	N/mm ²	180-200
Elongation	ASTM B209M	%	3.4

Mechanical Properties of Composite Panel According to ASTM standards

Description	Standard	Unit	Avg. Result
Section modulus	ASTM C393	cm ³ /m	0.5
Rigidity	ASTM D790	kN cm ² /m	3003 H26
Yield strength	ASTM E8	N/mm ²	69000
Tensile strength	ASTM E8	N/mm ²	145
Elongation	ASTM E8	%	180-200
Linear thermal expansion	ASTM D696	2.4mm/m for temperature difference @ 100° C	

Mechanical Properties of Aluminum Skin According to DIN standards

Description	Standard	Unit	Method
Skin Thickness	Calliper	mm	0.5
Alloy	DIN 1745-1	-	3.0517
Modulus of Elasticity	DIN 1745-1	N/mm ²	69000
Yield Strength	DIN 1745-1	N/mm ²	140-165
Tensile Strength	DIN 1745-1	N/mm ²	170-210
Elongation	DIN 1745-1	%	3.9

Mechanical Properties of Composite Panel According to DIN standards

Description	Standard	Unit	Method
Section modulus	DIN 53293	cm ³ /m	1.52
Rigidity	DIN 53293	kN cm ² /m	1700-1950
Yield strength	DIN 53293	N/mm ²	40-42
Tensile strength	DIN 53293	N/mm ²	41-48
Elongation	DIN 53293	%	>5%
Linear thermal expansion	DIN 53293	2.32mm/m for temperature difference @ 100° C	



Mechanical Properties of Aluminum Skin According to EN standards

Description	Standard	Unit	Method
Skin Thickness	Calliper	mm	0.5
Alloy	EN 573-3	-	EN AW-3003
Modulus of Elasticity	EN 485-2:2008	N/mm ²	70000
Yield Strength	EN 485-2:2008	N/mm ²	142-150
Tensile Strength	EN 485-2:2008	N/mm ²	175-190
Elongation	EN 485-2:2008	%	3.6

Mechanical Properties of Composite Panel According to EN standards

Description	Standard	Unit	Method
Section modulus	EN 14509	cm ³ /m	1.54
Rigidity	EN 14509	kN cm ² /m	1650-1900
Yield strength	EN 14509	N/mm ²	36-45
Tensile strength	EN 14509	N/mm ²	40-45
Elongation	EN 14509	%	>5%
Linear thermal expansion	EN 14509	2.4mm/m for temperature difference @ 100° C	

• Thermal Conductivity

Compared to solid materials, Techno Bond FR A2 has a lower thermal conductivity. The table below shows the thermal conductivity comparison of different materials.

Material	Thermal Conductivity (W/m K)
4mm Techno Bond FR A2	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
0°C	0.024

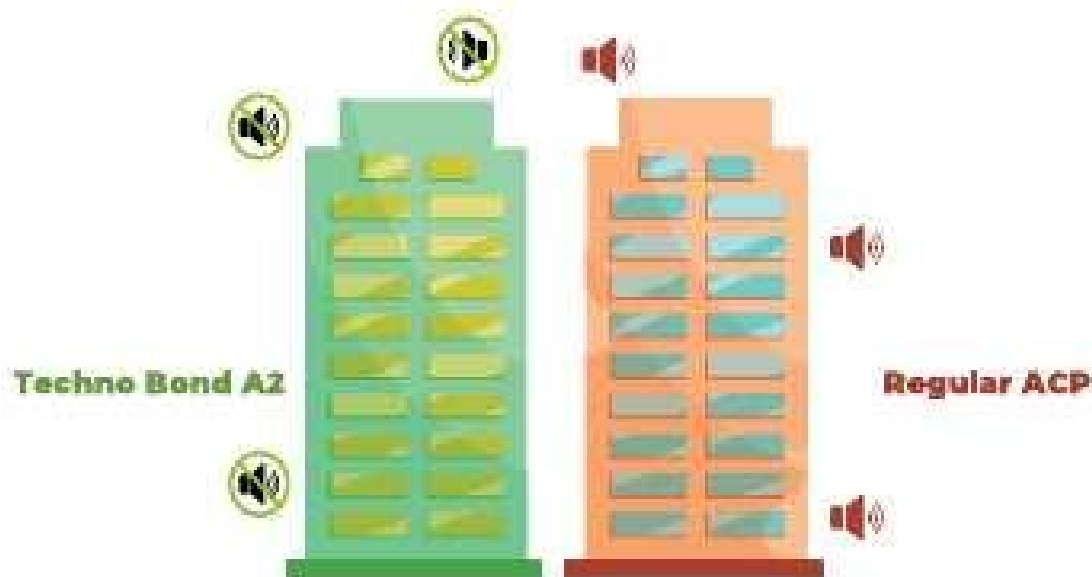
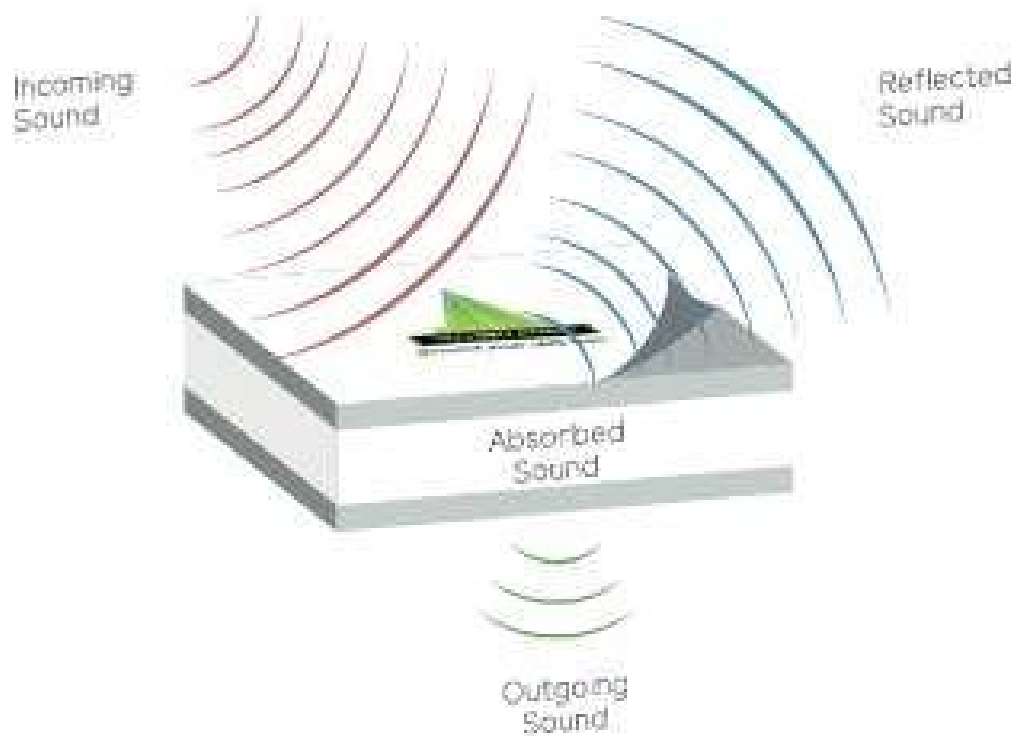
• U Value

Thermal Properties of Techno Bond - 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	5.65
4mm	0.0103	5.54
6mm	0.0172	5.34

• Sound Acoustic Properties

Techno Bond cladding panels have a high Sound Transmission Class according to the ASTM E413 standard, with an estimated value of 20-27 dB.



WEATHER RESISTANCE TEST



Test Report

Issue Date: 2021-10-11

Intertek Report No. 2107080035HF-001

Test Items, Method and Results

Test Item: Resistance to artificial weathering - Fluorescent UV lamps

Test Sample: UV Test (Coating test)

Test Method: ASTM D4587-11(2019) Cycle 4

Light Source: UVA-340

The Exposure cycle:

1) 8 hours dry, Irradiance: 0.89 W/m² at 340 nm, Black-panel temperature: 60 °C ± 2.5 °C

2) 4 hours condensation, Irradiance: UV lamps off, Black-panel temperature: 50 °C ± 2.5 °C

Test Duration: 2000 hours

Test Result:

Exposure time	ΔL*	Δa*	Δb*	ΔE*	Grey scale	Observation
2000 hours	1.08	0.02	-0.06	1.08	4-5	Part showed slight color change

**After test**

Features of TechnoBond Products



Fire Proofing



ECO Friendly



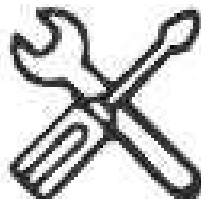
Corrosion Proofing



Various Designs



Fast Application



Easy Maintenance



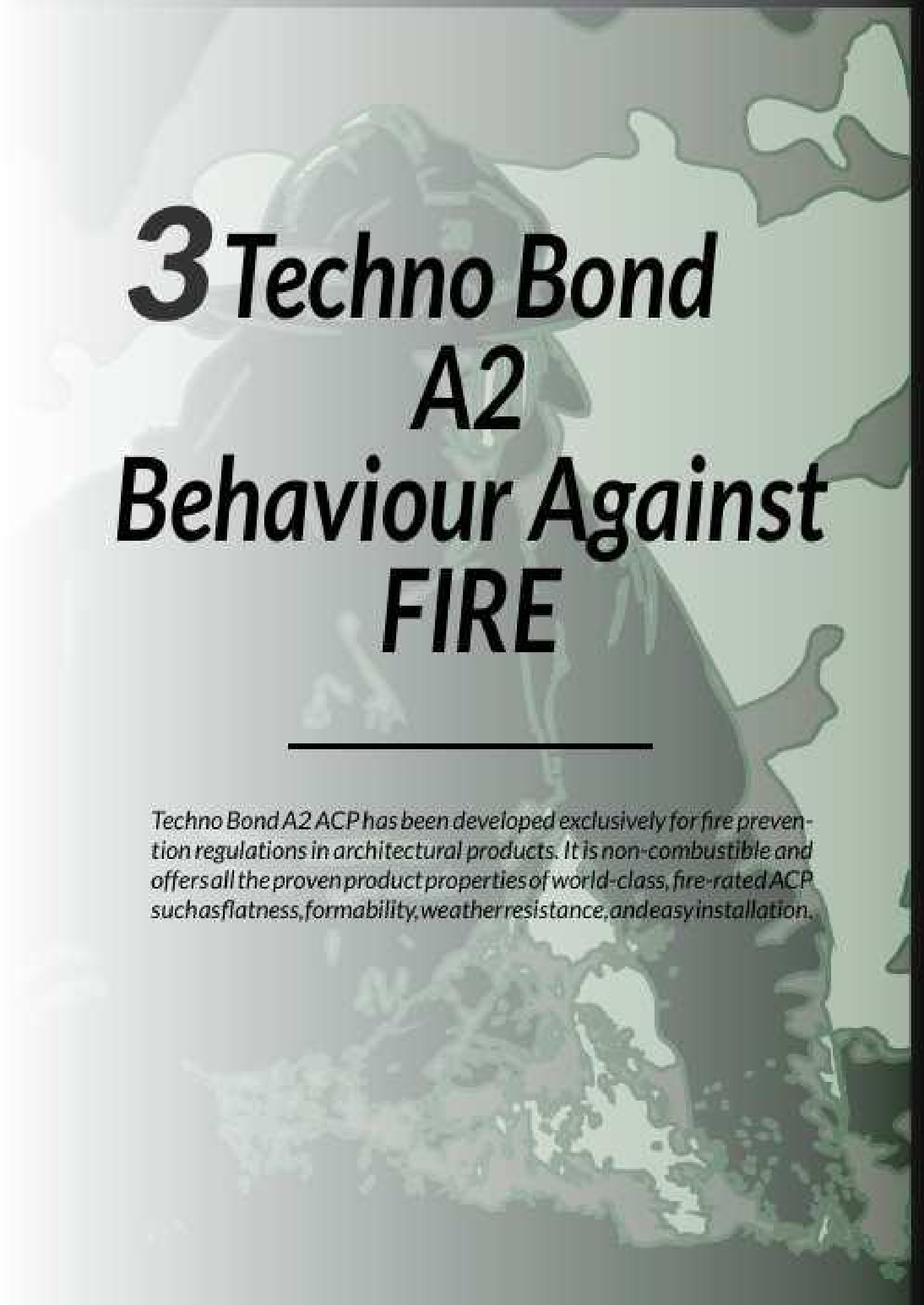
Oil Resistance



Custom Colours



Pollution Resistance



3 Techno Bond A2 Behaviour Against FIRE

Techno Bond A2 ACP has been developed exclusively for fire prevention regulations in architectural products. It is non-combustible and offers all the proven product properties of world-class, fire-rated ACP such as flatness, formability, weather resistance, and easy installation.

Techno Bond (FR A2) Behaviour Against FIRE

- 1- Fire is restricted when in contact with the non-combustible mineral-filled core.
- 2- As per international standard tests, Techno Bond A2 core material does not show any droplets, which helps keep the fire under control.
- 3- Since Techno Bond A2 panels do not fall from their place, they also act as a barrier to prevent oxygen from reaching the fire.
- 4- Despite delivering ultimate fire safety performance, Techno Bond A2 still maintains its original properties such as flatness, strength, durability, easy maintenance, and quick installation.
- 5- Techno Bond A2 is absolutely free of radiation and is completely smoke-free.

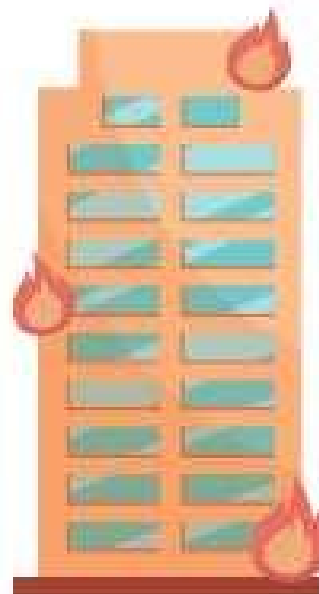


INTERNAL OR EXTERNAL FIRE INCIDENT

Techno Bond A2

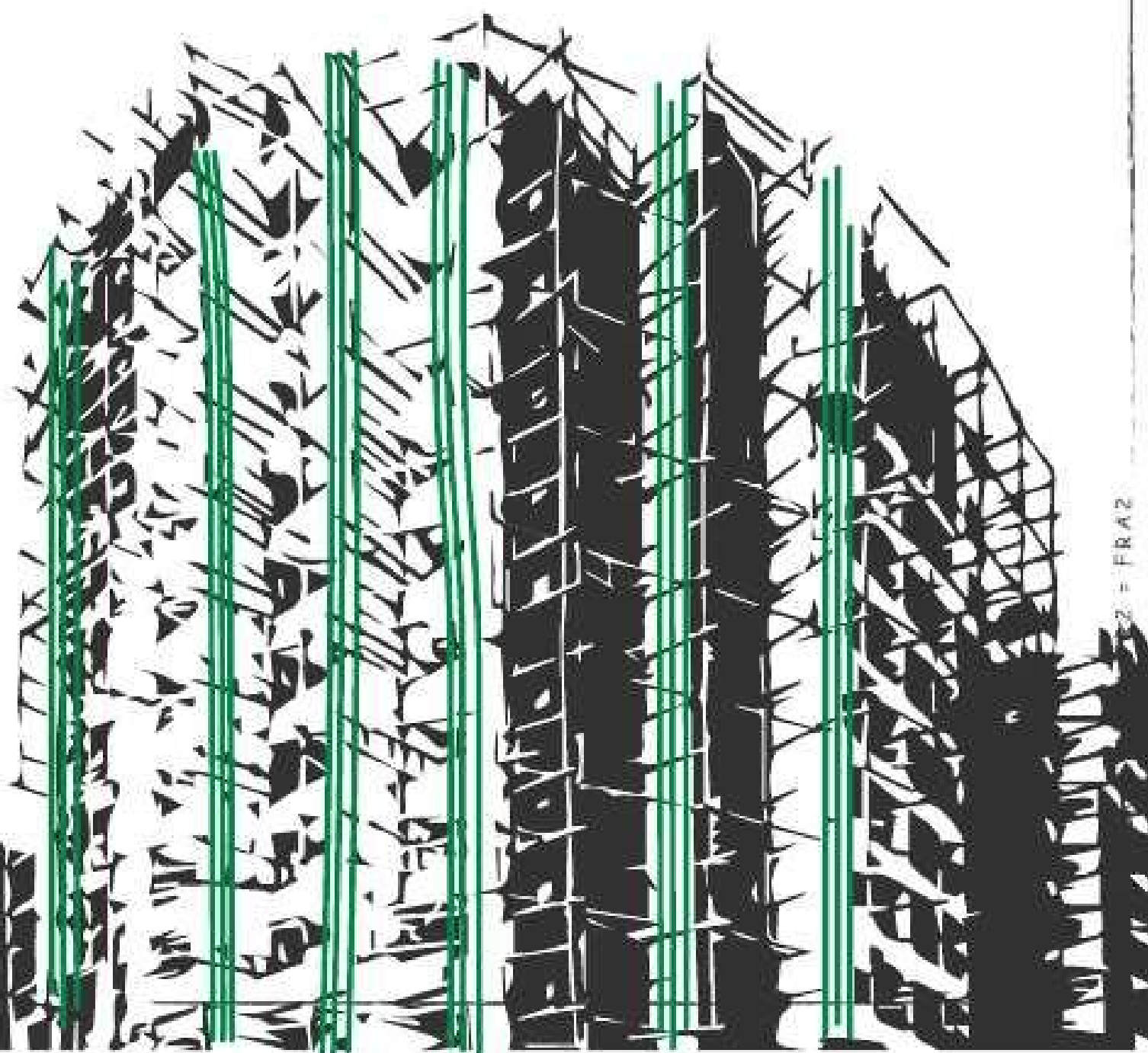


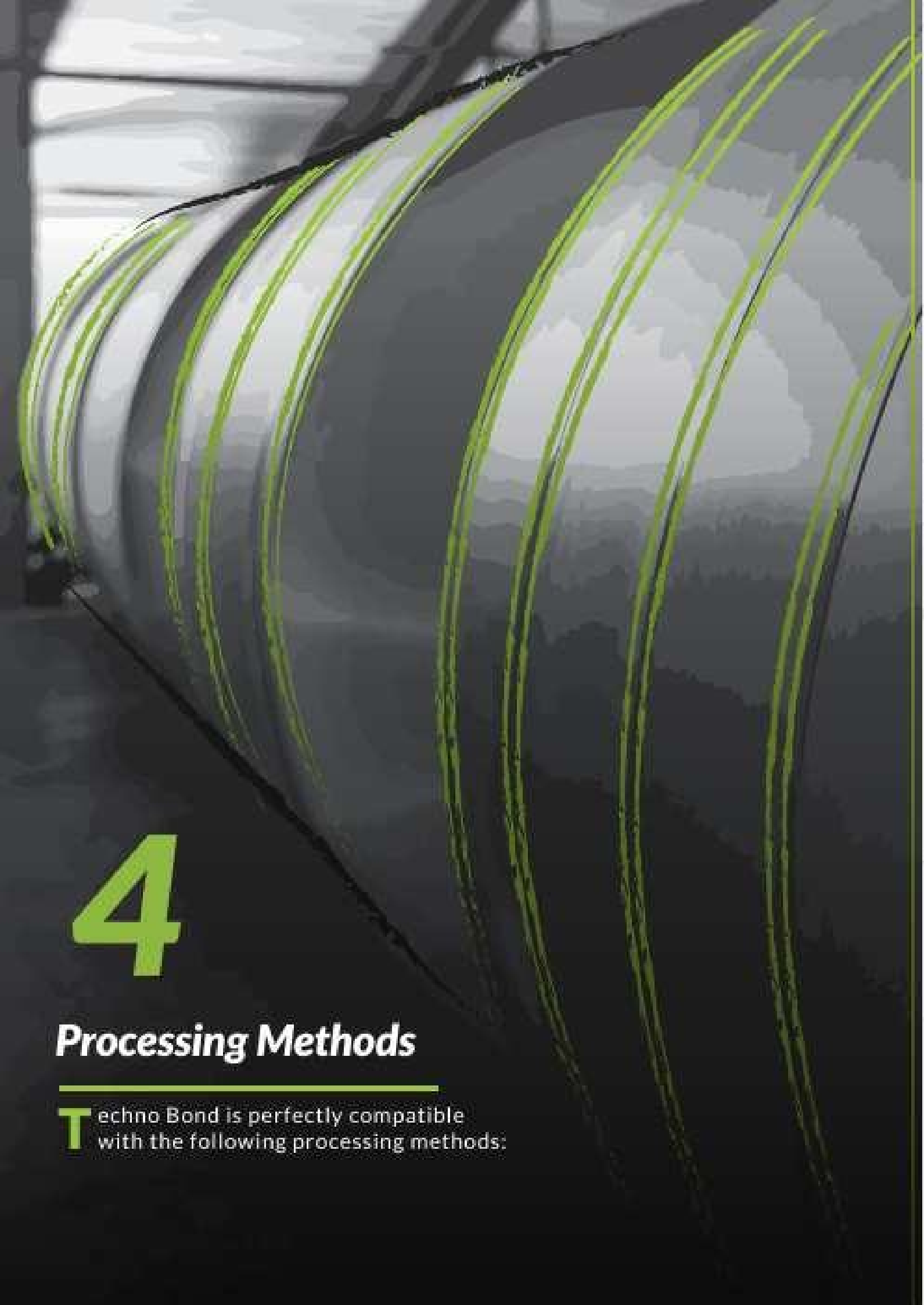
Regular ACP



• Fire Performance

Thickness	4	mm	Calliper
Core Thickness	3	mm	Calliper
Core Material	High mineral filled inorganic non-combustible		
Combustible Ingredients Within Core Material	< 10	%	
Flash-Ignition Temperature	520	°C	ASTM D1929
Self-Ignition Temperature	530	°C	ASTM D1929
Shear Strength	1,025	psi	ASTM D732
Thermal resistance	0.063	m ² K/W	ASTM C518-15
Heat transmittance coefficient	5.54	W/m ² K	ASTM C518-15
Linear thermal expansion	116	/m.°C	ASTM D696-16
Thermal conductivity	0.103	W/m-K	ASTM C518-15
Heat Deflection	115	°C	ASTM D648

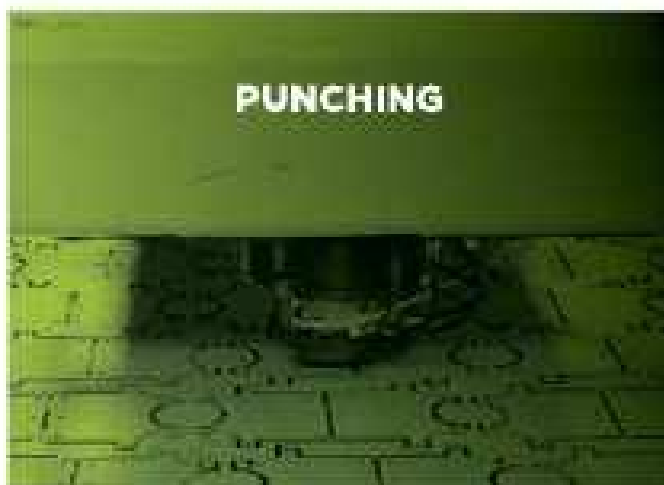
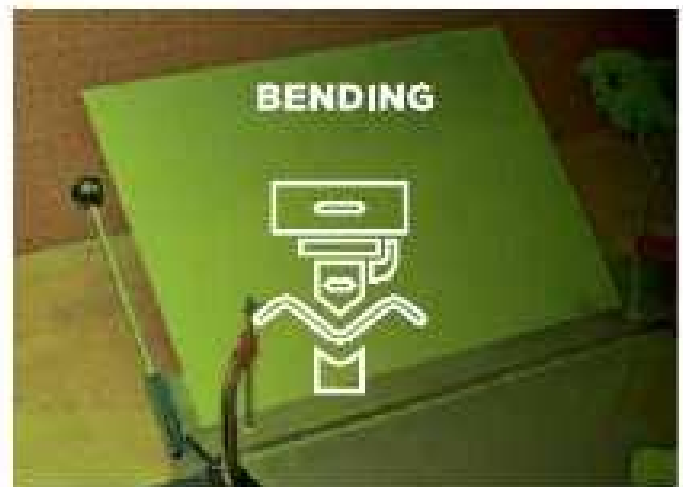
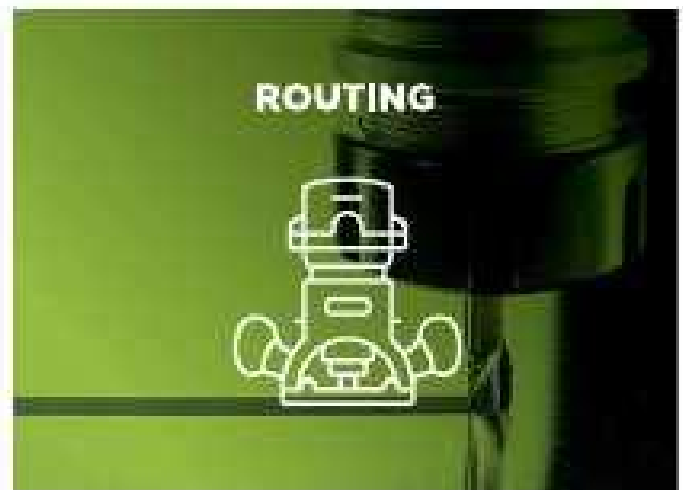




4

Processing Methods

Techno Bond is perfectly compatible with the following processing methods:



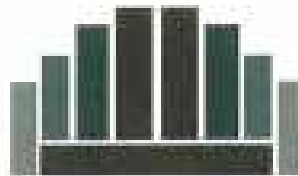
5 Quality Certification

أهم شهادات جودة شركة ألواح الخليج
« تكنوبوند » للنوع المقاوم للحريق فئة

FR-A2
2025-2026



• THOMAS BELL-WRIGHT CERTIFICATES



THOMAS BELL-WRIGHT
A GLOBAL LEADER COMPANY



In accordance with UKAS accreditation to ISO/IEC 17065
Certification is Hereby Granted

to

Alwah Alkhaleej Industrial Co.

Al-Ameedd St., Al-Faisallah Dist., Riyadh,
12188, Kingdom of Saudi Arabia

for

"Techno Bond FR-A2"

4 mm thick Aluminium Composite Panel

(BS EN 13501-1:2018, ASTM E84-22, and ASTM D1929-23)

which, subject to limitations described on the following pages and continued
listing on www.tbwcert.com, complies with Product Certification Scheme
*SD03 Exterior Wall Assemblies, Curtain Walls, Building Materials,
Products & Assemblies*

In witness whereof, this Certificate is issued this 27th day of August 2024



Sandy Dwaik

Sandy Dwaik
Chief Executive Officer

Nicholas Purcell

Nicholas Purcell
Director of Certification

Certificate Number: TBW0301076

Initial registration: August 27, 2024

Issued: August 27, 2024

Expiration: August 26, 2027

File Name: YA172_CRT_SD03RX_Isual_01

(copy)

See certificates and modules are held in force by regular factory production by Thomas Bell-Wright International Certificates (TBWC).
Refer to www.tbwcert.com or contact TBWC Certification Department to indicate the current status of the certification.
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• THOMAS BELL-WRIGHT TEST REPORT

TEST REPORT REACTION TO FIRE TEST

Test Sponsor:

Alwah Alkhaleej Industrial Co. (Techno Bond)
Al-Ameed Street
Al-Faisallah District
Riyadh, 121881
Kingdom of Saudi Arabia
T: +966 543245318
Website: www.techno-bond.com

Test Material / Assembly:

Techno Bond FR-A2 4mm thick Aluminium Composite Panel

Test Standard

ASTM D1929-23; Standard Test Method for Determining Ignition Temperature of Plastics



THOMAS BELL-WRIGHT
INTERNATIONAL CONSULTANTS

Test Date: 11-Jun-24

Issue Date: 3-Jul-24

Test Reference No: YA178-1

PO BOX 26385, DUBAI UAE

T: +971 (0)4 821 5777

fire@bell-wright.com

www.bell-wright.com

DUBAI

DOHA

RIVADH

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THOMAS BELL-WRIGHT
INTERNATIONAL CONSULTANTS

Test Report Ref. No. YA178-1

Accreditation

Testing

ISO/IEC 17025: General requirements for the competence of testing and calibration laboratories with:

United Kingdom Accreditation Service (UKAS) - Testing Laboratory: **4439**
www.ukas.com



Memberships

Members of European Group of Organization for Fire Testing, Inspection and Certification

www.egolf.org.uk

Member of Association for Specialist Fire Protection

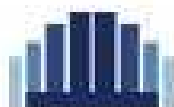
www.asfp.org.uk

Member of Centre for Window and Cladding Technology

www.cwct.co.uk



The work which is the subject of this report falls under the accreditations of ISO 17025 UKAS.



THOMAS BELL-WRIGHT
INTERNATIONAL CONSULTANTS

Test Report Ref. No. YA178-1

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THOMAS BELL-WRIGHT
INTERNATIONAL CONSULTANTS

Test Report Ref. No. YA178-1

1. INTRODUCTION

Determination of the flash ignition temperature and spontaneous ignition temperature of Techno Bond FR-A2 4mm thick Aluminium Composite Panel using hot-air ignition furnace as per ASTM D 1929-23; Standard Test Method for Determining Ignition Temperature of Plastics.

2. SPONSOR

Name: Alwah Alkhaleej Industrial Co. (Techno Bond)
Address: Al-Ameed Street,
Al-Faisallah District,
Riyadh, 121881
Kingdom of Saudi Arabia
Tel.: +966 543245318
Website: www.techno-bond.com

3. TESTING LABORATORY

Name: Thomas Bell-Wright International Consultants (TBWIC)
Address: Corner of 46th and 47th streets, Jebel Ali Industrial Area 1,
P.O. Box 26385, Dubai, U.A.E.
T: +971 (0) 4 821 5777
www.bell-wright.com

4. DATE OF TEST

Sample received: 10-May-24
Test date: 11-Jun-24

The test had not been witnessed by the sponsor.

5. SPECIMEN DESCRIPTION

Note: The testing laboratory does not hold any responsibility for the information that has been provided by the test sponsor which could not be verified by the testing laboratory, as this could affect the validity of the test result. All information that could not be verified will be indicated by an asterisk () mark.*

Product Name		Techno Bond FR-A2*	
Product Description		4mm thick Aluminium Composite Panel PVDF Coated, Silver*	
Manufacturer		Alwah Alkhaleej Industrial Co.*	
Product Details	Top Coat PVDF	Reference	Note 1
		Manufacturer	Beckers*
		Colour Tested	Silver (observed by TBWIC)
		Dry Film Thickness	20 µm* (stated)
		Dry Density	1900 kg/m ³ * (stated)
	Primer	Reference	Note 1
		Manufacturer	Note 1
		Film Thickness	7 µm* (stated)
		Dry Density	1520 kg/m ³ * (stated)



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INTERNATIONAL CONSULTANTS

Test Report Ref. No.: YA178-1

	Aluminum Skin (Top)	Reference	Alloy 3003
		Manufacturer	Note 1
		Thickness	0.5 mm* (stated)
		Density	2700 kg/m ³ * (stated)
	Adhesive	Reference	Note 1
		Manufacturer	Note 1
		Film Thickness	80 µm (measured by TBWIC)
		Dry Density	875 kg/m ³ (measured by TBWIC)
	Core	Reference	Note 1
		Manufacturer	Note 1
		Thickness	3.0 mm* (stated)
		Density	2000 kg/m ³ (measured by TBWIC)
	Adhesive	Reference	Note 1
		Manufacturer	Note 1
		Film Thickness	40 µm (measured by TBWIC)
		Dry Density	750 kg/m ³ (measured by TBWIC)
	Aluminium Skin (Bottom)	Reference	Alloy 3003
		Manufacturer	Note 1
		Thickness	0.5 mm* (stated)
		Density	2700 kg/m ³ * (stated)
Back Coat	Reference	Note 1	
	Manufacturer	Note 1	
	Colour	Brown (observed by TBWIC)	
	Dry Film Thickness	15 µm* (stated)	
	Dry Density	1700 kg/m ² * (stated)	
Overall Thickness		4 mm* (stated)	
Area Weight		8.735 kg/m ² (measured by TBWIC)	
Form tested		Tile (observed by TBWIC)	

Note 1: The sponsor was unable to provide this information.



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INTERNATIONAL CONSULTANTS

Test Report Ref. No. YA178-1

6. SPECIMEN VERIFICATION

TBWIC testing laboratory has not been involved in the selection or design of the specimen. However, the materials were selected, marked, and signed by a representative from TBWIC Certification Division (Certification Body) on 30-Apr-24 as shown below. The results of the test apply only to the samples as received.



Note: There are contexts where information has been provided by the sponsor and verification of information has been done through either technical datasheet or other document submission, or as indicated directly by the sponsor. For this reason, materials have been tested in an as-received condition and TBWIC bears no liability for the legitimacy of the submitted information.

7. SPECIMEN PREPARATION PROCEDURE

In accordance with section 7.2 of ASTM D1929, the specimen Techno Bond FR-A2 4mm thick Aluminium Composite Panel provided by the sponsor was cut into a mass of 3.0 ± 0.2 g, as it had a density greater than 100 kg/m^3 . Each sample was conditioned as per section 7.4 of ASTM D1929.

8. METHOD OF TEST

8.1. Test Procedure

The test specimens were evaluated in accordance with ASTM D1929-23, *Standard Test Method for Determining Ignition Temperature of Plastics*.

Flash Ignition Temperature (FIT) and Spontaneous Ignition Temperature (SIT) was then determined.

Flash ignition temperature (FIT)- the minimum temperature at which, under specified test conditions, sufficient flammable gases were emitted to ignite momentarily upon application of a small external pilot flame.

Spontaneous ignition temperature or self-ignition temperature (SIT)- the minimum temperature at which the self-heating properties of the specimen lead to ignition or ignition occurs of itself, under specified test conditions, in the absence of any additional flame ignition source.

8.2. Conditioning

After delivery on 1-May-24, the specimen was stored in room temperature for a minimum of 40 hours prior to the test ranging from 21 to 25°C and 45 to 55% relative humidity.

Note: There were deviations observed in the temperature and relative humidity in 4 separate probes of thermo-hygrometer in our conditioning room, however the average values were within the limit.



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INTERNATIONAL CONSULTANTS

Test Report Ref. No. YA178-1

9. TEST OBSERVATIONS

Observations	Results
1. Flash Ignition:	
Specimen weight, g	3.0
Air flow rate, Q_0	2.6
Flash Ignition at nozzle, min-sec	Not observed
Flaming combustion of the specimen, min-sec	1:28
Glowing combustion of the specimen, min-sec	Not observed
Explosion, min-sec	Not observed
Rapid rise in temperature T_1 above that of T_2	1:28
Lowest Air Temperature, T_2 , at which flash observed, °C	460
2. Spontaneous Ignition:	
Specimen weight, g	3.1
Air flow rate, Q_0	2.6
Flaming combustion of the specimen, min-sec	6:24
Glowing combustion of the specimen, min-sec	Not observed
Rapid rise in temperature T_1 above that of T_2	6:24
Lowest Air Temperature, T_2 , at which the specimen burns, °C	467

10. SUMMARY OF RESULTS

The test specimen has been evaluated in accordance with ASTM D 1929-20: Standard Test Method for Determining Ignition Temperature of Plastics.

The test results are:

Flash Ignition Temperature (FIT), °C	460
Spontaneous Ignition Temperature (SIT), °C	467

Test results relate only to the specimen tested and there is no pass or fail criteria for ASTM D1929-23 standard.



THOMAS BELL-WRIGHT
INTERNATIONAL CONSULTANTS

Test Report Ref. No. YA178-1

11. LIMITATION

"These test results relate only to the behavior of test specimens under the particular conditions of the test. They are not intended to be used, and shall not be used, to assess the potential fire hazards of a material in use." - Clause 9.1.10 of ASTM D1929-23.

This report and all records of the test to which it relates may be not be retained by TBWIC further than 5 years from the date of testing.

This test report is respectfully submitted by: Thomas Bell-Wright International Consultants

Tested & Prepared by:

Reviewed and Authorized by:


Sally Fleming
Fire Testing Engineer




Malak Megly
Fire Testing Engineer

Report Revision Tracking		
Revision No.	Date Issued	Notes & Amendments
Rev: 00	03 Jul 24	This is the first issue of the report. No revisions are included.



THOMAS BELL-WRIGHT
INTERNATIONAL CONSULTANTS

Test Report Ref. No. YA178-1

12. SAMPLE PHOTOS



— End of Test Report —

CLASSIFICATION OF REACTION TO FIRE PERFORMANCE IN ACCORDANCE WITH BS EN 13501-1:2018

Test Sponsor:

Alwah Alkhaleej Industrial Co. (Techno Bond)
Al-Ameed Street
Al-Falsallah District
Riyadh, 121881
Kingdom of Saudi Arabia
T: +966 543245318
Website: www.techno-bond.com

Test Material

Techno Bond FR-A2 4mm thick Aluminium Composite Panel



THOMAS BELL-WRIGHT
INTERNATIONAL CONSULTANTS

Issue Date: 3-Jul-24

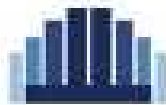
Classification Report Reference No: YA178-9

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Data Sheet FR2 - FRA2



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Classification Report Reference No. VA178-9

Memberships

Members of European Group of Organization for Fire Testing, Inspection and Certification

www.egolf.org.uk

Member of Association for Specialist Fire Protection

www.asfp.org.uk

Member of Centre for Window and Cladding Technology

www.cwct.co.uk



The work which is the subject of this report falls under the accreditations of ISO 17025 UKAS.



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Classification Report Reference No. YA178-9

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Classification Report Reference No. YA178-9

1. INTRODUCTION

This classification report defines the classification assigned to Techno Bond FR-A2 4mm thick Aluminium Composite Panel as described in Section 4 in accordance with the procedures given in BS EN 13501-1:2018. Fire classification of construction products and building elements – Part 1: Classification using data from reaction to fire tests.

2. SPONSOR

Name: Alwah Alkhaleej Industrial Co. (Techno Bond)
Address: Al-Ameed Street
Al-Faisalah District
Riyadh, 121881
Kingdom of Saudi Arabia
T: +966 543245318
Website: www.techno-bond.com

3. TESTING LABORATORY

Name: Thomas Bell-Wright International Consultants (TBWIC)
Address: Corner of 46th and 47th Streets,
Jebel Ali Industrial Area 1
Dubai, UAE
T: +971 04 821 5777
Website: www.bell-wright.com

4. DETAILS OF CLASSIFIED PRODUCT

4.1 Product Description

Note: The testing laboratory does not hold any responsibility for the information that has been provided by the test sponsor which could not be verified by the testing laboratory, as this could affect the validity of the test result. All information that could not be verified will be indicated by an asterisk (*) mark.

Product Name		Techno Bond FR-A2*	
Product Description		4mm thick Aluminium Composite Panel PVDF Coated, Silver*	
Manufacturer		Alwah Alkhaleej Industrial Co.*	
Thickness, Total		4 mm* (stated)	
Area Weight, Total		8.735 kg/m ² (measured by TBWIC)	
Product Details	Top Coat PVDF	Reference	Note 1
		Manufacturer	Beckers*
		Colour Tested	Silver (observed by TBWIC)
		Dry Film Thickness	20 µm* (stated)
		Dry Density	1900 kg/m ³ (stated)
	Primer	Reference	Note 1
		Manufacturer	Note 1



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		Film Thickness	7 μm^* (stated)
		Dry Density	1520 kg/m^3 (stated)
	Aluminum Skin (Top)	Reference	Alloy 3003*
		Manufacturer	Note 1
		Thickness	0.5 mm^* (stated)
		Density	2700 kg/m^3 (stated)
	Adhesive	Reference	Note 1
		Manufacturer	Note 1
		Film Thickness	80 μm (measured by TBWIC)
		Dry Density	875 kg/m^3 (measured by TBWIC)
	Core	Reference	Note 1
		Manufacturer	Note 1
		Thickness	3.0 mm^* (stated)
		Density	2000 kg/m^3 (measured by TBWIC)
	Adhesive	Reference	Note 1
		Manufacturer	Note 1
		Film Thickness	40 μm (measured by TBWIC)
		Dry Density	750 kg/m^3 (measured by TBWIC)
	Aluminium Skin (Bottom)	Reference	Alloy 3003*
		Manufacturer	Note 1
		Thickness	0.5 mm^* (stated)
		Density	2700 kg/m^3 (stated)
	Back Coat	Reference	Note 1
		Manufacturer	Note 1
		Colour	Brown (observed by TBWIC)
		Dry Film Thickness	15 μm^* (stated)
		Dry Density	1700 kg/m^3 (stated)

Note 1: The sponsor was unable to provide this information.



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5. SPECIMEN PREPARATION PROCEDURE

TBWIC testing laboratory has not been involved in the selection or design of the specimen. However, the materials were selected, marked, and signed by the representative from TBWIC Certification Division (Certification Body) on 30-Apr-24 as shown below. The results of the test apply only to the samples as received.



Note: There are contexts where information has been provided by the sponsor and verification of information has been done through either technical datasheet or other document submission, or as indicated directly by the sponsor. For this reason, materials have been tested in an as-received condition and TBWIC bears no liability for the legitimacy of the submitted information.

6. REPORT & TEST RESULTS IN SUPPORT OF THIS CLASSIFICATION

6.1 Reports

Name of Laboratory	Test Sponsor	Test Report No.	Test Method/Field of Application Rules
Thomas Bell-Wright International Consultants (TBWIC)	Alwah Alkhaleej Industrial Co. (Techno Bond)	YA178-3	BS EN ISO 1716:2018
		YA178-8	EN 13823:2020+A1:2022

6.2 Results

Test Method	Test Parameters for Class A2			No. of tests	Results	
	Component type	Limits	Layers		Continuous parameter-mean (m)	Compliance parameters
BS EN ISO 1716:2018	External Non-substantial	PCS ≤ 4.0 MJ/m ²	Top Coat PVDF (Silver)	3	0.9	1.1
			Primer	3	0.2	
	Internal Non-substantial	PCS ≤ 4.0 MJ/m ²	Adhesive 80µm	3	3.1	Compliant
			Adhesive 40µm	3	1.3	
	Substantial	PCS ≤ 3.0 MJ/kg	Core	3	0.0	Compliant
			Aluminium Skin	0	0.0	Compliant
	Product as a whole	PCS ≤ 3.0 MJ/kg	-	-	0.7	Compliant



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Test Method	Test Parameters	No. of tests	Results	
			Continuous parameter- mean (m)	Compliance parameters
BS EN 13823:2020 +A1:2022	CRITERIA for class "A2"			
	$FIGRA_{0.500} \leq 120 \text{ W/s}$	3	20	Compliant
	$THR_{0.500} \leq 7.5 \text{ MJ}$	3	2.5	Compliant
	Lateral Flame Spread < Edge of specimen	3	< Edge of specimen	Compliant
	CRITERIA for subclass "s1"			
	$SMDGRA \leq 30 \text{ m}^2/\text{s}^{2/3}(\text{total})$	3	0	Compliant
	$TSP_{0.500} \leq 50 \text{ m}^2(\text{total})$	3	16	Compliant
	CRITERIA for subclass "d0"			
	Faming droplets / Particles within 600s	3	Nil	Compliant

Note 1: Corrected value as per Annex A, Clause A.6.1.2 of BS EN 13823:2020+A1:2022.



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Classification Report Reference No. YA178-9

7. CLASSIFICATION & FIELD OF APPLICATION

7.1 Reference of classification

This classification has been carried out in accordance with clause 8 of EN 13501-1:2018.

7.2 Classification

The product, Techno Bond FR-A2 4mm thick Aluminium Composite Panel, in relation to its reaction to fire behavior are classified;

Fire behavior		Smoke Production			Flaming droplets	
A2	-	s	1	,	d	0

Reaction to fire classification: A2 – s1, d0

7.3 Field of application

This classification is valid for the following end use applications:

- Construction applications

This classification is also valid for the following product parameters:

Overall Product Thickness	No variation allowed
Product Density	No variation allowed
Product Composition	No variation allowed
Product Construction	No variation allowed
Coating thickness	No variation allowed
Coating Type	No variation allowed
Color	Valid for all color range
Joints	Valid for materials with or without vertical and horizontal joints of ≤15 mm



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Classification Report Reference No. YA178-9

8. LIMITATIONS

This document does not represent type approval or certification of the product. Similarly, the BS EN ISO 1716:2018 / BS EN 13823:2020+A1:2022 fire tests and related work which are a subject of this classification report have been conducted under Thomas Bell-Wright International Consultant's ISO 17025 UKAS accreditation scheme and quality management system. However, pursuant to UKAS Technical Bulletin BS EN 13501 & BS 135 Classification Documents (Dated 02-Feb-2022), classification documents are completed on an unaccredited basis because they are not themselves test procedures. As such, this document is prepared on an unaccredited basis.

This report and all records of the test to which it relates may be not be retained by TBWIC further than 5 years from the date of testing.

This test report is respectfully submitted by: Thomas Bell-Wright International Consultants.

Prepared by:

Reviewed and Authorized by:

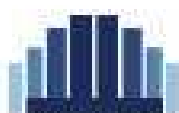

 Sally Fleming
 Fire Testing Engineer


 P.O. Box 20305
 DUBAI - U.A.E.


 Malak Magdy
 Fire Testing Engineer

Report Revision Tracking

Revision No.	Date Issued	Notes & Amendments
Rev. 00	03-Jul-24	This is the first issue of the report. No revisions are included.



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Classification Report Reference No. YA178-9

9. ANNEXURE A

Classes of reaction to fire performance for construction products excluding floorings and linear pipe thermal insulation products

Class	Test method(s)	Classification criteria	Additional classification
A1	EN ISO 1182 ^a and	$\Delta T \leq 30^\circ\text{C}$; and $\Delta m \leq 50\%$; and $t_f = 0$ (i.e. no sustained flaming)	*
	EN ISO 1716	$PCS \leq 2,0 \text{ MJ/kg}^b$ and $PCS \leq 2,0 \text{ MJ/kg}^{bc}$ and $PCS \leq 1,4 \text{ MJ/m}^2d$ and $PCS \leq 2,0 \text{ MJ/kg}^e$	*
A2	EN ISO 1182 ^a or	$\Delta T \leq 50^\circ\text{C}$; and $\Delta m \leq 50\%$; and $t_f \leq 20 \text{ s}$	*
	EN ISO 1716 and	$PCS \leq 3,0 \text{ MJ/kg}^b$ and $PCS \leq 4,0 \text{ MJ/m}^2b$ and $PCS \leq 4,0 \text{ MJ/m}^2d$ and $PCS \leq 3,0 \text{ MJ/kg}^e$	*
	EN 13823	$FIGRA \leq 120 \text{ W/s}$ and $LFS < \text{edge of specimen}$ and $THR_{max} \leq 7,5 \text{ MJ}$	Smoke production ^f and Flaming droplets/particles ^g
B	EN 13823 and	$FIGRA \leq 120 \text{ W/s}$ and $LFS < \text{edge of specimen}$ and $THR_{max} \leq 7,5 \text{ MJ}$	Smoke production ^f and Flaming droplets/particles ^g
	EN ISO 11925-2 ^h : Exposure = 30 s	$F_s \leq 150 \text{ mm}$ within 60 s	
C	EN 13823 and	$FIGRA \leq 250 \text{ W/s}$ and $LFS < \text{edge of specimen}$ and $THR_{max} \leq 15 \text{ MJ}$	Smoke production ^f and Flaming droplets/particles ^g
	EN ISO 11925-2 ^h : Exposure = 30 s	$F_s \leq 150 \text{ mm}$ within 60 s	
D	EN 13823 and	$FIGRA \leq 750 \text{ W/s}$	Smoke production ^f and Flaming droplets/particles ^g
	EN ISO 11925-2 ^h : Exposure = 30 s	$F_s \leq 150 \text{ mm}$ within 60 s	
E	EN ISO 11925-2 ^h : Exposure = 15 s	$F_s \leq 150 \text{ mm}$ within 20 s	Flaming droplets/particles ^g
F	No performance determined		

^a For homogeneous products and substantial components of non-homogeneous products.

^b For any external non-substantial component of non-homogeneous products.

^c Alternatively, any external non-substantial component having a $PCS \leq 2,0 \text{ MJ/m}^2$, provided that the product satisfies the following criteria of EN 13823: $FIGRA \leq 20 \text{ W/s}$, and $LFS < \text{edge of specimen}$, and $THR_{max} \leq 4,0 \text{ MJ}$, and $s1$, and $d0$.

^d For any internal non-substantial component of non-homogeneous products.



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^a For the product as a whole.

^b In the last phase of the development of the test procedure, modifications of the smoke measurement system have been introduced, the effect of which needs further investigation. This may result in a modification of the limit values and/or parameters for the evaluation of the smoke production.

S1 = SMOGRA $\leq 30\text{m}^2/\text{s}^2$ and TSP_{lim} $\leq 50\text{m}^2$; **s2** = SMOGRA $\leq 180\text{m}^2/\text{s}^2$ and TSP_{lim} $\leq 200\text{m}^2$; **s3** = not s1 or s2

^c **d0** = no flaming droplets/ particles in EN 13823 within 600 s;

d1 = no flaming droplets/ particles persisting longer than 10 s in EN 13823 within 600 s;

d2 = not d0 or d1.

Ignition of the paper in EN ISO 11925-2 results in a d2 classification.

^d Pass = no ignition of the paper (no classification);

Fail = ignition of the paper (d2 classification).

^e Under conditions of surface flame attack and, if appropriate to the end-use application of the product, edge flame attack.

— End of Classification Report —

TEST REPORT REACTION TO FIRE TEST

Test Sponsor:

Alwah Alkhaleej Industrial Co. (Techno Bond)
Al-Ameed Street
Al-Falsallah District
Riyadh, 121881
Kingdom of Saudi Arabia
T: +966 543245318
Website: www.techno-bond.com

Test Material:

Techno Bond FR-A2 4mm thick Aluminium Composite Panel

Test Standard

BS EN 13823:2020+A1:2022 Reaction to Fire Tests for Building Products — Building Products excluding Floorings exposed to the Thermal Attack by a Single Burning Item



**THOMAS BELL-WRIGHT
INTERNATIONAL CONSULTANTS**

Test Date: 11-Jun-24

Issue Date: 3-Jul-24

Test Reference No: YA178-8

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fire@bell-wright.com

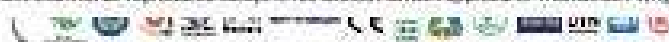
www.bell-wright.com

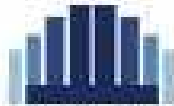
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Accreditation

Testing

ISO/IEC 17025: General requirements for the competence of testing and calibration laboratories with:

United Kingdom Accreditation Service (UKAS) - Testing Laboratory: 4439
www.ukas.com



Memberships

Members of European Group of Organization for Fire Testing, Inspection and Certification

www.egolf.org.uk

Member of International Trade Council

www.thetradecouncil.com

Member of Association for Specialist Fire Protection

www.asfp.org.uk

Member of Centre for Window and Cladding Technology

www.cwct.co.uk



The work which is the subject of this report falls under the accreditations of ISO 17025 UKAS.



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INTERNATIONAL CONSULTANTS

Test Report Ref. No. YA178-8

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Test Report Ref. No. YA178-8

1. INTRODUCTION

Determination of Reaction to fire performance of building products excluding floorings when exposed to thermal attack by a Single Burning Item (SBI) (a sand-box burner supplied with propane) in accordance with BS EN 13823:2020+A1:2022.

2. SPONSOR

Name: Alwah Alkhakej Industrial Co. (Techno Bond)
Address: Al-Ameed Street
Al-Faisaliah District
Riyadh, 121881
Kingdom of Saudi Arabia
T: +966 543245318
Website: www.techno-bond.com

3. TESTING LABORATORY

Name: Thomas Bell-Wright International Consultants (TBWIC)
Address: Corner of 46th and 47th Streets,
Jebel Ali Industrial Area 1
Dubai, United Arab Emirates
T: +971 (0)4 821 5777
Website: www.bell-wright.com

4. DATE OF TEST

Sample received: 10-May-24
Test date: 11-Jun-24

The test was not witnessed by the sponsor.



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Test Report Ref. No. YA178-B

5 SPECIMEN DESCRIPTION

Note: The testing laboratory does not hold any responsibility for the information that has been provided by the test sponsor which could not be verified by the testing laboratory, as this could affect the validity of the test result. All information that could not be verified will be indicated by an asterisk () mark.*

Product Name		Techno Bond FR-A2*	
Product Description		4mm thick Aluminium Composite Panel PVDF Coated, Silver*	
Manufacturer		Alwah Alkhaleej Industrial Co.*	
Thickness, Total		4 mm* (stated)	
Area Weight, Total		8.735 kg/m ² (measured by TBWIC)	
Product Details	Top Coat PVDF (Fire side)	Reference	Note 1
		Manufacturer	Beckers*
		Colour Tested	Silver (observed by TBWIC)
		Dry Film Thickness	20 µm* (stated)
		Dry Density	1900 kg/m ³ * (stated)
	Primer	Reference	Note 1
		Manufacturer	Note 1
		Film Thickness	7 µm* (stated)
		Dry Density	1520 kg/m ³ * (stated)
	Aluminium Skin (Top)	Reference	Alloy 3003*
		Manufacturer	Note 1
		Thickness	0.5 mm* (stated)
	Adhesive	Density	2700 kg/m ³ * (stated)
		Reference	Note 1
		Manufacturer	Note 1
		Film Thickness	80 µm (measured by TBWIC)
		Dry Density	875 kg/m ³ (measured by TBWIC)
	Core	Reference	Note 1
		Manufacturer	Note 1
		Thickness	3.0 mm* (stated)
		Density	2000 kg/m ³ (measured by TBWIC)
	Adhesive	Reference	Note 1
		Manufacturer	Note 1
		Film Thickness	40 µm (measured by TBWIC)
		Dry Density	750 kg/m ³ (measured by TBWIC)
	Aluminium Skin (Bottom)	Reference	Alloy 3003*
		Manufacturer	Note 1
		Thickness	0.5 mm* (stated)
		Density	2700 kg/m ³ * (stated)

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	Back Coat	Reference	Note 1
		Manufacturer	Note 1
		Colour	Brown (observed by TBWIC)
		Dry Film Thickness	15 μm^* (stated)
		Dry Density	1700 kg/m^3 (stated)
Backing Board	Material	Calcium Silicate Board (verified by TBWIC)	
	Density	840 kg/m^3 (measured by TBWIC)	
	Thickness	12 mm (measured by TBWIC)	
	Classification	A2-s1, d0 as per EN 13501-1:2018 (verified by TBWIC)	
Type of joint	1. Vertical Joints: 15 mm open joint at 200 mm from the corner line to the center of the joint, measured when the wings are mounted. 2. Horizontal Joints: 15 mm open joint at 500 mm from the specimen bottom to the center of the joint, measured when the wings are mounted.		
Specimen Dimensions	Small Wing: Panel 1 – 495 x 1500 mm (w x h) (Measured) Long Wing: Panel 2 – 196.7 x 492.5 mm (w x h) (Measured) Panel 3 – 196.7 x 992.5 mm (w x h) (Measured) Panel 4 – 792.5 x 992.5 mm (w x h) (Measured) Panel 5 – 792.5 x 492.5 mm (w x h) (Measured) Refer to Drawing No.1 for more information/details.		
Specimen Placement	The Techno Bond FR-A2 4mm thick Aluminium Composite Panel was prepared according to section 5.2.2 of BS EN 13823:2020+A1:2022. It was mounted mechanically using 3.5 x 25mm drywall screws and washers on calcium silicate board substrate. The long wing specimen and backing board were placed on the trolley using mechanical clamps, with the side edge of the backing board of the small wing and the bottom edge of the specimen against the long U-profile on the trolley floor. Refer to Drawing No. 1 & 2 for more details.		

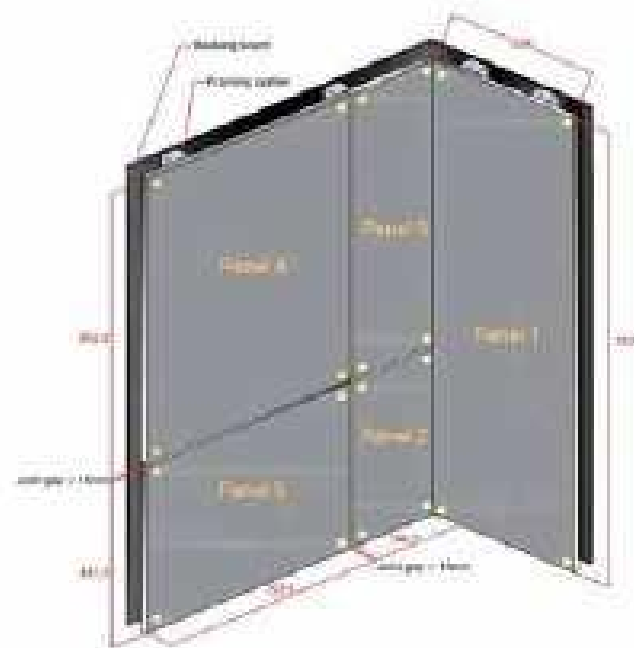
Note 1: The sponsor was unable to provide this information.



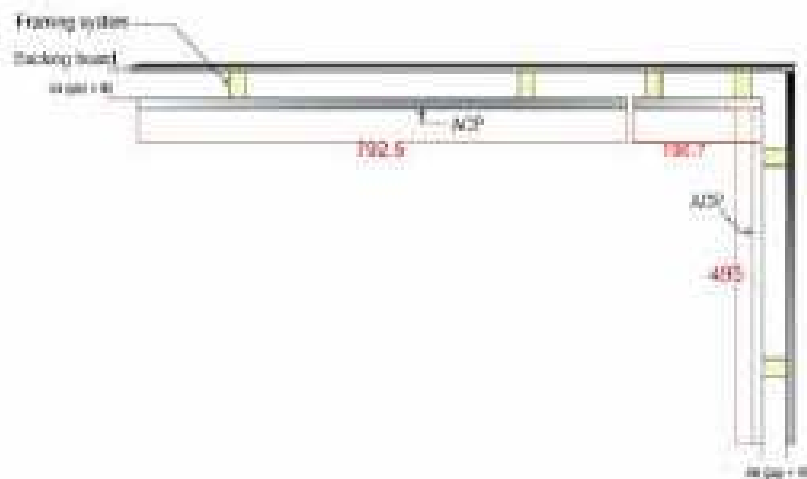
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6. SPECIMEN DRAWING



Drawing 1: Dimensions of the long and short wing of the test specimen.
All dimensions are in millimeters (mm).



Drawing 2: Top view of the mounted specimen with airgap.
All dimensions are in millimeters (mm).



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7. SPECIMEN VERIFICATION

TBWIC testing laboratory has not been involved in the selection or design of the specimen. However, the materials were selected, marked, and signed by a representative from TBWIC Certification Division (Certification Body) on 30-Apr-24 as shown below. The results of the test apply only to the samples as received.



Note: There are contexts where information has been provided by the sponsor and verification of information has been done through either technical datasheet or other document submission, or as indicated directly by the sponsor. For this reason, materials have been tested in an as-received condition and TBWIC bears no liability for the legitimacy of the submitted information.

8. METHOD OF TEST

B.1. Test Procedure

The test was performed in accordance with the requirements of BS EN 13823:2020+A1:2022 "Reaction to fire tests for building products – Building products excluding floorings exposed to the thermal attack by the single burning item".

B.2. Conditioning

After delivery on 10-May-24, the specimens were conditioned to constant weight at 21 to 25 °C and 45 to 55% relative humidity as per BS EN 13238:2010 "Reaction to fire tests for building products – Conditioning procedures and general rules for selection of substrates".

Note: There were deviations observed in the temperature and relative humidity in 4 separate probes of thermo-hygrometer in our conditioning room, however the average values were within the limit.



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Test Report Ref. No. YA178-8

9. OBSERVATION

Test Data and Observation

Observations	Specimen 1	Specimen 2	Specimen 3
Occurrence of sustained flames reaching the far edge of long wing specimen at any height between 500-1000mm at any time during the test - LFS	Nil	Nil	Nil
Flaming droplets/particles within the first 600s	Nil	Nil	Nil
Burning droplets/particles ≥10s within the first 600s	Nil	Nil	Nil
End of test, s	1560	1560	1560

10. SUMMARY OF RESULTS

The test specimen has been evaluated in accordance with BS EN 13823:2020+A1:2022 Reaction to fire tests for building products — Building products excluding floorings exposed to the thermal attack by a single burning item.

The complete test results are:

TEST PARAMETERS	TEST RESULTS			Average
	Specimen 1	Specimen 2	Specimen 3	
$FGRA_{3,1500}$ (W/s)	17	27	16	20
$FGRA_{3,1500}$ (W/s)	17	27	16	20
$THR_{3,1500}$ MJ	2.1	3.2	2.1	2.5
$SMDGRA_{3,1500}$ (m ² /s) ¹	0	0	0	0
$TSP_{3,1500}$ (m ² /s) ²	15	35	18	16
Occurrence of sustained flames reaching the far edge of long wing specimen at any height between 500-1000mm at any time during the test - LFS	Nil	Nil	Nil	Nil
Flaming droplets/particles ≥ 10s within the first 600s	Nil	Nil	Nil	Nil
Burning droplets/particles ≥10s within the first 600s	Nil	Nil	Nil	Nil

Note 1: Corrected value as per ANNEX A, Clause A.6.1.2 of BS EN 13823:2020+A1:2022.



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Test Report Ref. No. YA178-8

11 LIMITATION

"The test results relate to the behavior of the test specimens of a product under the particular conditions of the test; they are not intended to be sole criterion for assessing the potential fire hazard of the product in use" - Clause 10q, BS EN 13823:2020+A1:2022

Results are valid for the tested configuration only.

This report and all records of the test to which it relates may be not be retained by TBWIC further than 5 years from the date of testing.

This test report is respectfully submitted by: Thomas Bell-Wright International Consultants

Tested & Prepared by:

Reviewed and Authorized by:


Sally Fleming
Fire Testing Engineer




Malak Megly
Fire Testing Engineer

Report Revision Tracking

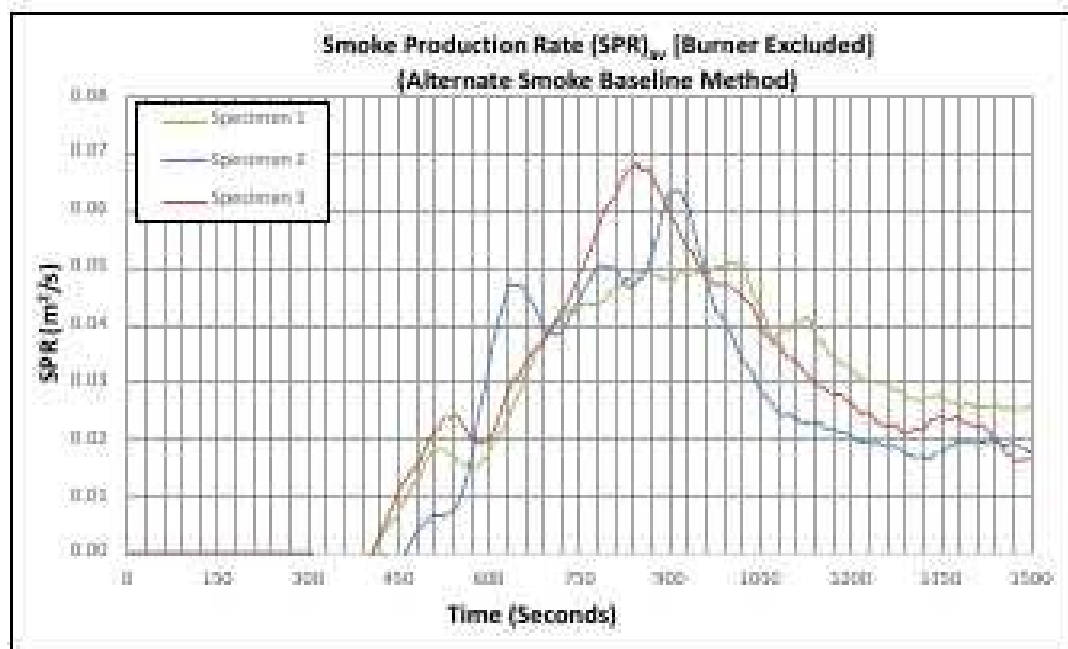
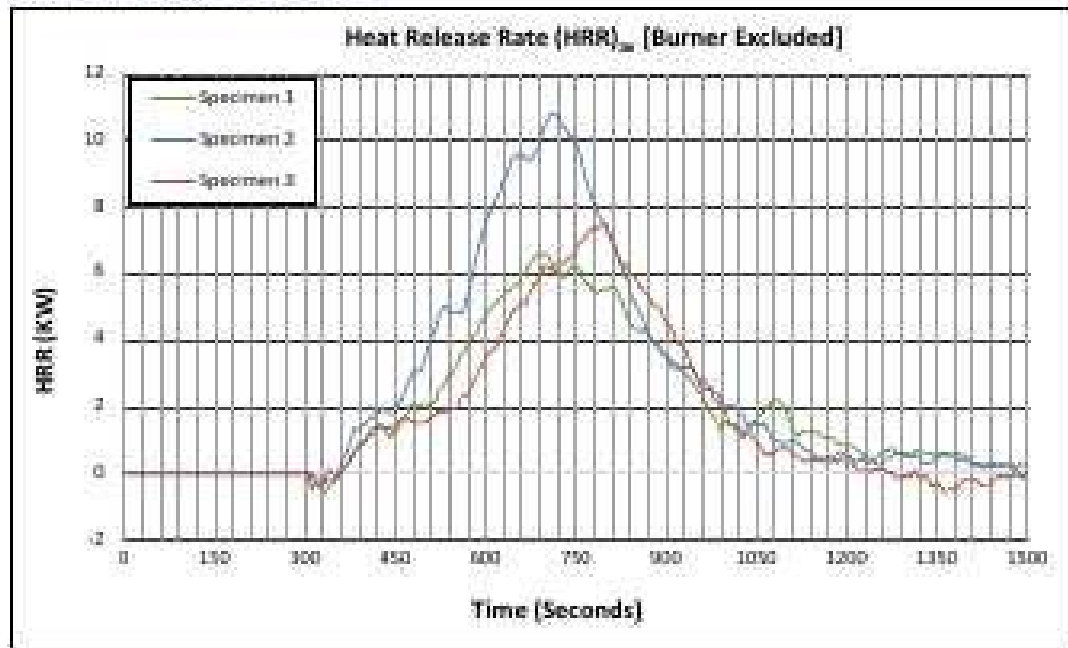
Revision No.	Date Issued	Notes & Amendments
Rev. 00	03-Jul-24	This is the first issue of the report. No revisions are included.



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Test Report Ref. No. YA178-8

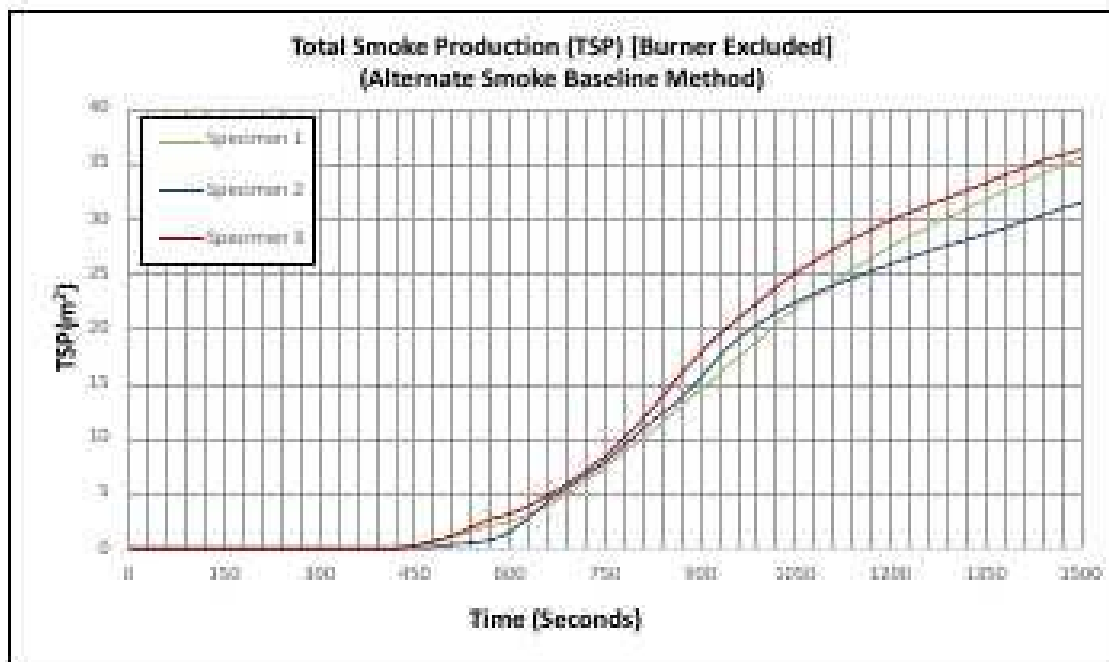
12. APPENDIX 1- GRAPHS

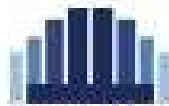




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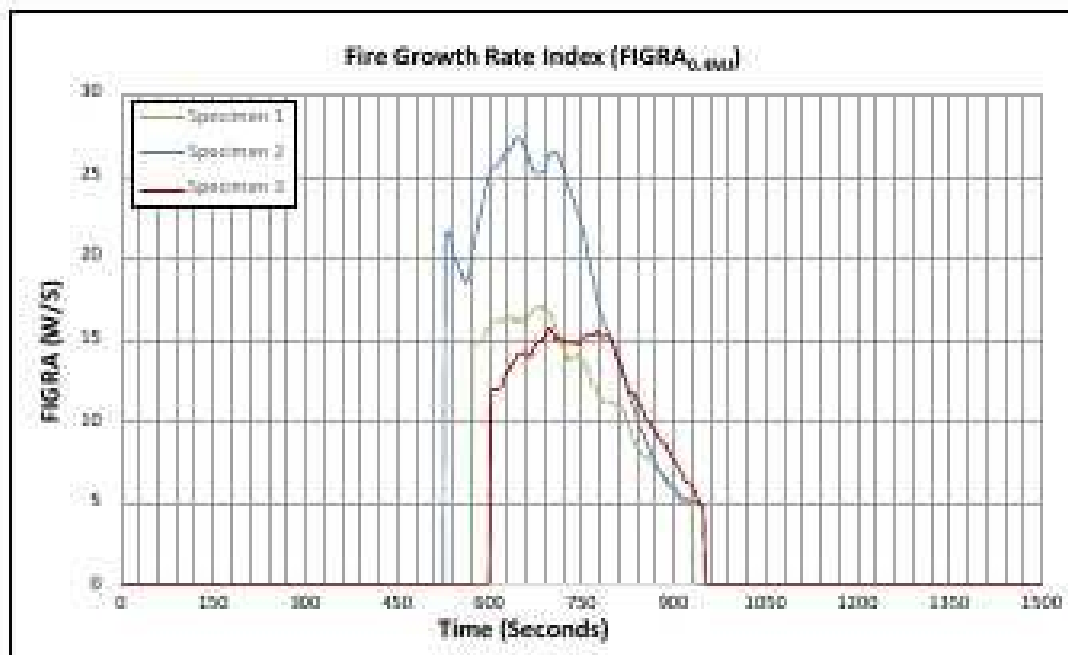
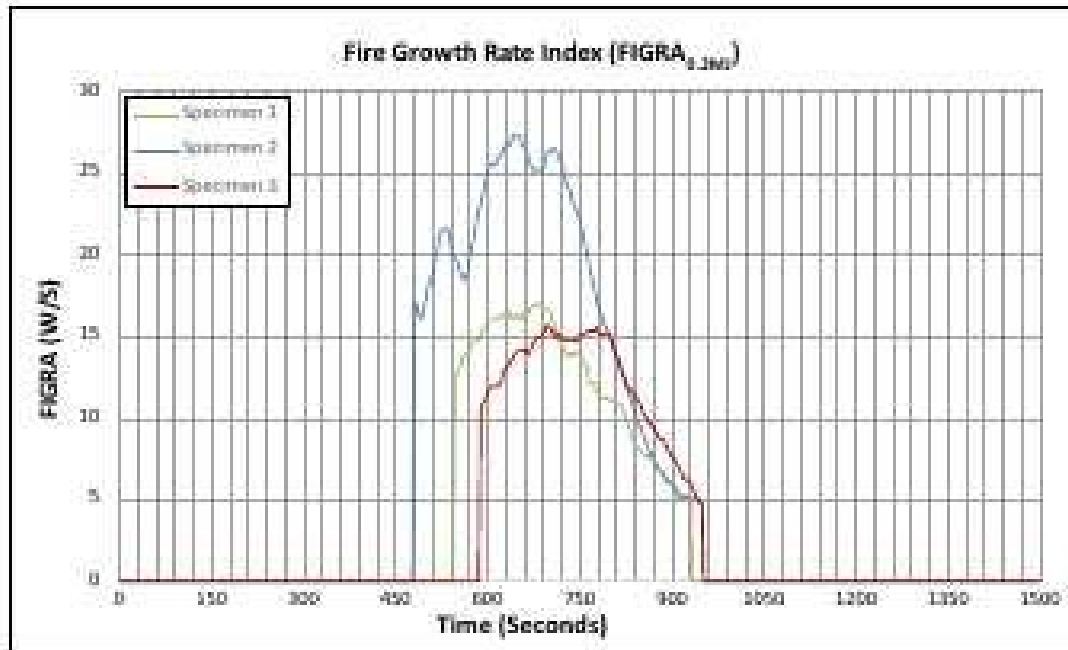
Test Report Ref. No. YA178-8





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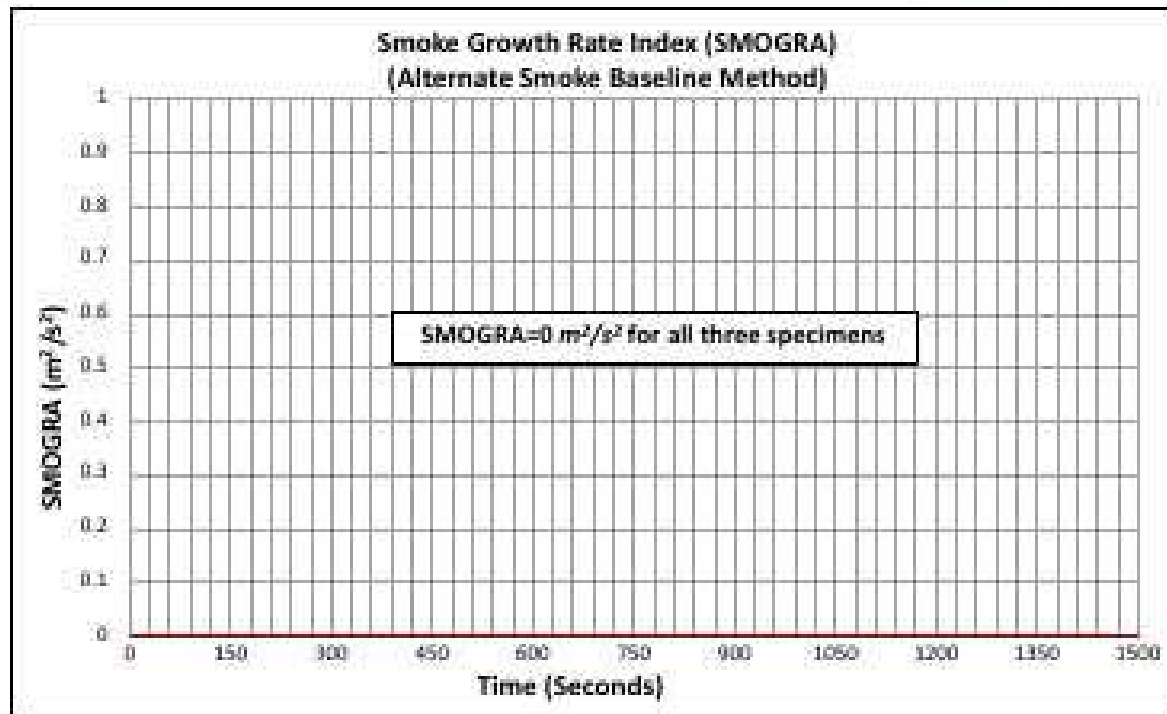
Test Report Ref. No. YA178-B





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Test Report Ref. No. YA178-8





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Test Report Ref. No. YA178-8

13. APPENDIX 2- PHOTOS



Specimen before the test



Specimen after the test

— End of Test Report —

TEST REPORT REACTION TO FIRE TEST

Test Sponsor:

Alwah Alkhaleej Industrial Co. (Techno Bond)
Al-Ameed Street
Al-Faisaliah District
Riyadh, 121881
Kingdom of Saudi Arabia
T: +966 543245318
Website: www.techno-bond.com

Test Material:

Techno Bond FR-A2 4mm thick Aluminium Composite Panel

Test Standard:

ASTM E84 – 22: Standard Test Method for Surface Burning Characteristics of Building Materials



**THOMAS BELL-WRIGHT
INTERNATIONAL CONSULTANTS**

PO BOX 26385, DUBAI UAE T: +971 (0)4 821 5777 fire@bell-wright.com www.bell-wright.com

DUBAI

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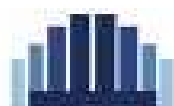
Test Date: 12-Jun-24

Issue Date: 3-Jul-24

Test Reference No: YA178-2

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Data Sheet FR2 - FRA2



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Test Report Ref. No. YA178-2

Accreditation

Testing

ISO/IEC 17025: General requirements for the competence of testing and calibration laboratories with:

United Kingdom Accreditation Service (UKAS) - Testing Laboratory: 4439

www.ukas.com



GCC Accreditation Center (GAC) - Testing Laboratory: ATL-0017

www.GCC-accreditation.org



Memberships

Members of European Group of Organization for Fire Testing, Inspection and Certification

www.egolf.org.uk

Member of Association for Specialist Fire Protection

www.asfp.org.uk

Member of Centre for Window and Cladding Technology

www.cwct.co.uk



The work which is the subject of this report falls under the accreditations of ISO 17025 UKAS and ISO 17025 GAC.



THOMAS BELL-WRIGHT
INTERNATIONAL CONSULTANTS

Test Report Ref. No. VA178-2

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THOMAS BELL-WRIGHT
INTERNATIONAL CONSULTANTS

Test Report Ref. No. YA178-2

1 INTRODUCTION

Determination of the flame spread index and the smoke developed index of Techno Bond FR-A2 4mm thick Aluminium Composite Panel as per ASTM E84 – 22; Standard Test Method for Surface Burning Characteristics of Building Materials.

2 SPONSOR

Name: Alwah Alkhaleej Industrial Co. (Techno Bond)
Address: Al-Ameed Street
Al-Faisallah District
Riyadh, 121881
Kingdom of Saudi Arabia
T: +966 543245318
Website: www.techno-bond.com

3 TESTING LABORATORY

Name: Thomas Bell-Wright International Consultants (TBWIC)
Address: Corner of 46th and 47th streets, Jebel Ali Industrial Area 1
P.O. Box 26385, Dubai, U.A.E.
T: +971 (0) 4 821 5777
www.bell-wright.com

4 DATE OF TEST

Sample received date: 10-May-24
Test date: 12-Jun-24

The test was not witnessed by the sponsor.

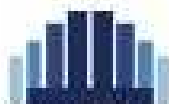
5. SPECIMEN DESCRIPTION

Note: The testing laboratory does not hold any responsibility for the information that has been provided by the test sponsor which could not be verified by the testing laboratory, as this could affect the validity of the test result. All information that could not be verified will be indicated by an asterisk () mark.*

Product Name		Techno Bond FR-A2*	
Product Description		4mm thick Aluminium Composite Panel PVDF Coated, Silver*	
Manufacturer		Alwah Alkhaleej Industrial Co.*	
Thickness, Total		4.17 mm (measured by TBWIC)	
Area Weight, Total		8.735 kg/m ² (measured by TBWIC)	
Product Details	Top Coat PVDF (Exposed Face)	Reference	Note 1
		Manufacturer	Beckers*
		Colour Tested	Silver (observed by TBWIC)
		Dry Film Thickness	20-µm* (stated)
		Dry Density	1900 kg/m ³ * (stated)
	Primer	Reference	Note 1
		Manufacturer	Note 1

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Test Report Ref. No. YA178-2

	Aluminum Skin (Top)	Film Thickness	7 μm^* (stated)
		Dry Density	1520 kg/m^3 (stated)
		Reference	Alloy 3003*
		Manufacturer	Note 1
		Thickness	0.5 mm* (stated)
		Density	2700 kg/m^3 (stated)
	Adhesive	Reference	Note 1
		Manufacturer	Note 1
		Film Thickness	80 μm (measured by TBWIC)
		Dry Density	875 kg/m^3 (measured by TBWIC)
	Core	Reference	Note 1
		Manufacturer	Note 1
		Thickness	3.0 mm* (stated)
		Density	2000 kg/m^3 (measured by TBWIC)
	Adhesive	Reference	Note 1
		Manufacturer	Note 1
		Film Thickness	40 μm (measured by TBWIC)
		Dry Density	750 kg/m^3 (measured by TBWIC)
	Aluminium Skin (Bottom)	Reference	Alloy 3003*
		Manufacturer	Note 1
		Thickness	0.5 mm* (stated)
		Density	2700 kg/m^3 (stated)
	Back Coat	Reference	Note 1
		Manufacturer	Note 1
		Colour	Brown (observed by TBWIC)
		Dry Film Thickness	15 μm^* (stated)
		Dry Density	1700 kg/m^3 (stated)
Dimensions per panel		2440 x 600 x 4 mm (l x w x thk) (measured by TBWIC)	
Quantity of panels		3 Nos.	
Total dimension		7320 x 600 x 4 mm (l x w x thk) (measured by TBWIC)	
Specimen placement		The 3 panels of Techno-Bond FR-A2 4mm thick Aluminium Composite Panel were butt jointed end-to-end. The test specimen was placed directly to the tunnel ledges with the PVDF Top Coat (Fire Side) towards the flame source.	

Note 1: The sponsor was unable to provide this information



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Test Report Ref. No. YA178-2

6. SPECIMEN VERIFICATION

TBWIC testing laboratory has not been involved in the selection or design of the specimen. However, the materials were selected, marked, and signed by a representative from TBWiC Certification Division (Certification Body) on 30-Apr-24 as shown below. The results apply to the samples as received.



Note: There are contexts where information has been provided by the sponsor and verification of information has been done through either technical datasheet or other document submission, or as indicated directly by the sponsor. For this reason, materials have been tested in an as-received condition and TBWiC bears no liability for the legitimacy of the submitted information.

7. METHOD OF TEST

7.1. Placing of test specimen

The test specimen consisted of 3 panels of Techno Bond FR-A2 4mm thick Aluminium Composite Panel. The dimension per panel was 2440 x 600 x 4 mm (l x w x t) and was butt jointed end-to-end. The total dimension of the specimen was 7320 x 600 x 4 mm (l x w x t).

Several sections of cement board butt jointed end-to-end with overall dimensions of 7350 x 600mm (l x w), were placed at the back of the sample to protect the furnace lid assembly.

7.2. Test Method

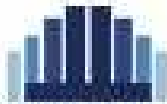
The specimen was placed in the ceiling position, supported horizontally on the ledges of the Steiner Tunnel. The PVDF Top Coat was exposed face down to the ignition source during the 30-minute test duration.

Flame Spread and Smoke Density were measured, and the results were compared against standard calibration materials (fiber cement board, heptane and red oak flooring).

7.3. Conditioning

After delivery on 10-May-24, the specimen was placed in a conditioned space where temperature and humidity were maintained between $23 \pm 2.8^\circ\text{C}$ and $50 \pm 5\%$ respectively, until constant weight was attained.

Note: There were deviations observed in the temperature and relative humidity in 4 separate probes of thermo-hygrometer in our conditioning room, however the average values were within the limit.



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Test Report Ref. No. YA178-2

8 OBSERVATION

Test Data and Observation

Observations	Result
Ignition Time (min:sec)	1:40
Time to maximum flame front advance (min:sec)	None
Maximum flame spread (ft)	None
Time to end of tunnel reached (min:sec)	Not Reached
Maximum temp recorded at the exposed thermocouple located near the end of the tunnel (°F / °C)	548 / 287
Dripping (min:sec)	None
Flaming on the floor (min:sec)	None
After flame on the top (min:sec)	None
After flame on the floor (min:sec)	None
Delamination (min:sec)	1:50
Sagging (min:sec)	None
Shrinkage (min:sec)	None
Fallout (min:sec)	None
FS*Time Area (ft²*min)	0
Smoke Area (%A*min)	7.57
Heptane Smoke Area (%A*min)	86.8

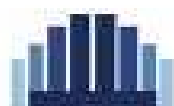
9 SUMMARY OF RESULTS

The test specimen has been evaluated in accordance with ASTM E84 – 22; Standard Test Method for Surface Burning Characteristics of Building Materials.

The test results are:

FLAME SPREAD INDEX (FSI)	0
SMOKE DEVELOPED INDEX (SDI)	10

Results are valid for the tested configuration only.



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INTERNATIONAL CONSULTANTS

Test Report Ref. No. YA178-2

10. CLASSIFICATIONS

The following information is designed to help put these test results into context. Flame Spread Index and Smoke Developed Index results from an ASTM E84 test are often used by regulatory agencies to approve materials for various applications. For example, the International Building Code 2021, Section 803.1.2 requires that:

Interior wall and ceiling finish materials shall be classified in accordance with ASTM E84 or UL 723-11th Ed. 2021. Such interior finish materials shall be grouped in the following classes in accordance with their flame spread and smoke-developed indices.

- Class A: Flame spread index 0 - 25; smoke-developed index 0 - 450.
- Class B: Flame spread index 26 - 75; smoke-developed index 0 - 450.
- Class C: Flame spread index 76 - 200; smoke-developed index 0 - 450.

Note that the above example is the IBC requirement for interior wall and ceiling finishes only; the application of the tested specimen may differ.



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Test Report Ref. No. YA178-2

11. LIMITATIONS

Testing of materials that melt, drip, or delaminate to such a degree that the continuity of the flame front is destroyed, results in low flame spread indices that do not relate directly to indices obtained by the testing materials that remain in place.

This report and all records of the test to which it relates may be not be retained by TBWIC further than 5 years from the date of testing.

This test report is respectfully submitted by: Thomas Bell-Wright International Consultants

Tested & Prepared by:

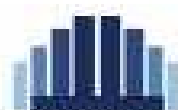
Reviewed and Authorized by:


Sally Fleming
Fire Testing Engineer




Malak Megly
Fire Testing Engineer

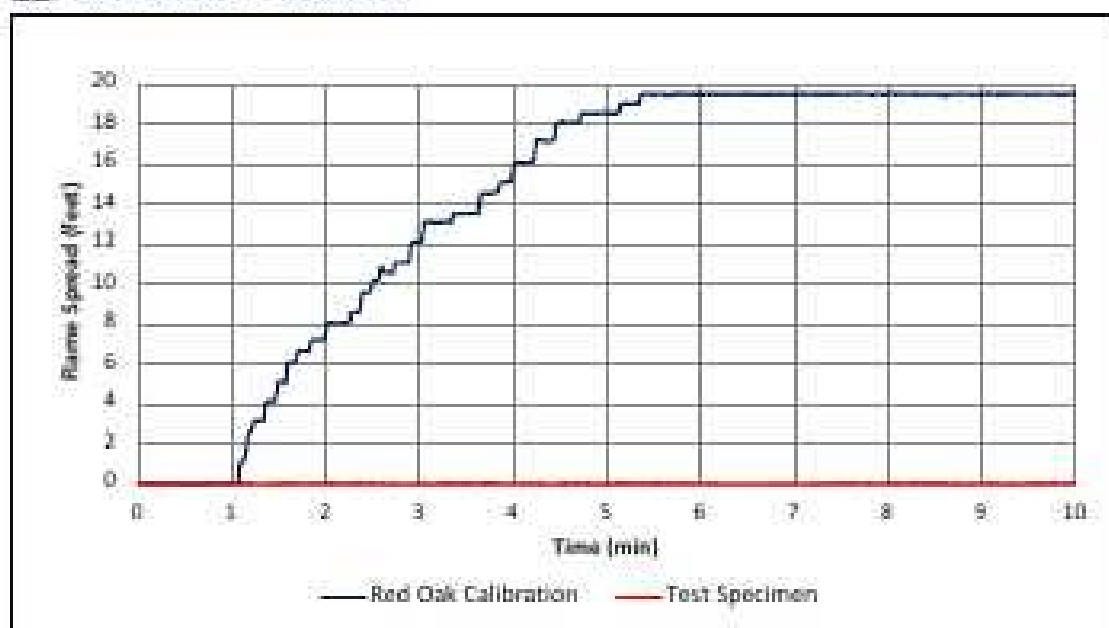
Report Revision Tracking		
Revision No.	Date Issued	Notes & Amendments
Rev. 00	03-Jul-24	This is the first issue of the report. No revisions are included.



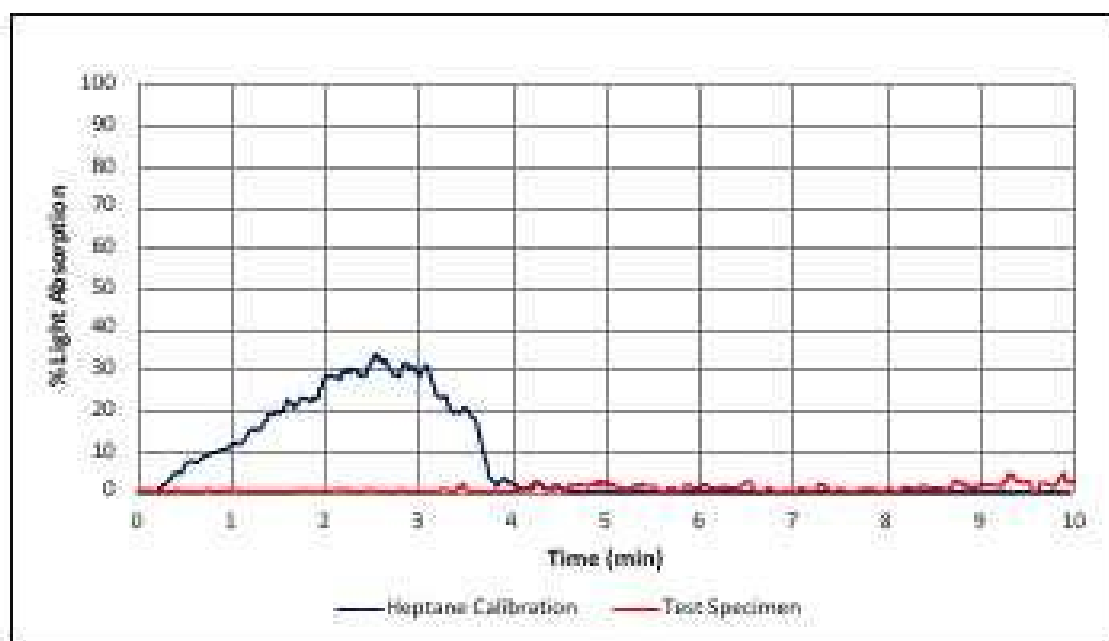
THOMAS BELL-WRIGHT
INTERNATIONAL CONSULTANTS

Test Report Ref. No. YA178-2

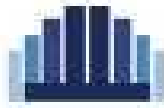
12 APPENDIX 1 - GRAPHS



Graph 1: Flame Spread Index (FSI)



Graph 2: Smoke Developed Index (SDI)



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Test Report Ref. No. YA178-2

13. APPENDIX 2 - PICTURES



Photo 1: Specimen before the test.
(Non Fire Side)



Photo 2: Specimen before the test.
(Fire Side)



Photo 3: Specimen after the test.
(As seen from the fire-end)



Photo 4: Specimen after the test.
(As seen from the exhaust end)

— End of Test Report —

TEST REPORT REACTION TO FIRE TEST

Test Sponsor:

Alwah Alkhaleej Industrial Co. (Techno Bond)
Al-Ameed Street
Al-Faisaliyah District
Riyadh, 121881
Kingdom of Saudi Arabia
T: +966 543245318
Website: www.techno-bond.com

Test Material:

Techno Bond FR-A2 4mm thick Aluminium Composite Panel

Test Standard

BS EN ISO 1716:2018 Reaction to Fire Tests for Products - Determination of the Gross Heat of Combustion (Calorific Value)



**THOMAS BELL-WRIGHT
INTERNATIONAL CONSULTANTS**

Test Date: 10-Jun-24

Issue Date: 3-Jul-24

Test Reference No: YA178-3

PO BOX 26385, DUBAI UAE

T: +971 (0) 4 821 5777

fire@bell-wright.com

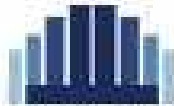
www.bell-wright.com

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THOMAS BELL-WRIGHT
INTERNATIONAL CONSULTANTS

Test Report Ref. No. YA178-3

Accreditation

Testing

ISO/IEC 17025: General requirements for the competence of testing and calibration laboratories with:

United Kingdom Accreditation Service (UKAS) - Testing Laboratory: 4439
www.ukas.com



Memberships

Members of European Group of Organization for Fire Testing, Inspection and Certification

www.egolf.org.uk

Member of Association for Specialist Fire Protection

www.asfp.org.uk

Member of Centre for Window and Cladding Technology

www.cwct.co.uk



The work which is the subject of this report falls under the accreditations of ISO 17025 UKAS.



THOMAS BELL-WRIGHT
INTERNATIONAL CONSULTANCY

Test Report Ref. No. YA178-3

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THOMAS BELL-WRIGHT
INTERNATIONAL CONSULTANTS

Test Report Ref. No. YA278-3

1. INTRODUCTION

Determination of the calorific potential of Techno Bond FR-A2 4mm thick Aluminium Composite Panel during combustion in accordance with BS EN ISO 1716:2018; Reaction to fire tests for products - Determination of the Gross Heat of Combustion (Calorific Value).

2. SPONSOR

Name: Alwah Alkhaleej Industrial Co. (Techno Bond)
Address: Al-Ameed Street
Al-Faisallah District
Riyadh, 121881
Kingdom of Saudi Arabia
T: +966 543245318
Website: www.techno-bond.com

3. TESTING LABORATORY

Name: Thomas Bell-Wright International Consultants (TBWIC)
Address: Corner of 46th and 47th streets, Jebel Ali Industrial Area 1
P.O. Box 26385, Dubai, U.A.E.
T: +971 (0) 4 821 5777
www.bell-wright.com

4. DATE OF TEST

Sample received: 10-May-24
Test date: 10-Jun-24

The test was not witnessed by the sponsor.

5. SPECIMEN DESCRIPTION

Note: The testing laboratory does not hold any responsibility for the information that has been provided by the test sponsor which could not be verified by the testing laboratory, as this could affect the validity of the test result. All information that could not be verified will be indicated by an asterisk () mark.*

Product Name		Techno Bond FR-A2*	
Product Description		4mm thick Aluminium Composite Panel PVDF Coated, Silver*	
Manufacturer		Alwah Alkhaleej Industrial Co.*	
Thickness, Total		4 mm* (stated)	
Area Weight, Total		8.735 kg/m ² (measured by TBWIC)	
Product Details	Top Coat PVDF	Reference	Note 1
		Manufacturer	Beckers*
		Colour Tested	Silver (observed by TBWIC)
		Dry Film Thickness	20 µm* (stated)
		Dry Density	1900 kg/m ³ * (stated)
	Primer	Reference	Note 1
		Manufacturer	Note 1
		Film Thickness	7 µm* (stated)



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Test Report Ref. No. YA178-3

		Dry Density	1520 kg/m ³ * (stated)
	Aluminum Skin (Top)	Reference	Alloy 3003*
		Manufacturer	Note 1
		Thickness	0.5 mm* (stated)
		Density	2700 kg/m ³ * (stated)
	Adhesive	Reference	Note 1
		Manufacturer	Note 1
		Film Thickness	80 µm (measured by TBWIC)
		Dry Density	875 kg/m ³ (measured by TBWIC)
	Core	Reference	Note 1
		Manufacturer	Note 1
		Thickness	3.0 mm* (stated)
		Density	2000 kg/m ³ (measured by TBWIC)
	Adhesive	Reference	Note 1
		Manufacturer	Note 1
		Film Thickness	40 µm (measured by TBWIC)
		Dry Density	750 kg/m ³ (measured by TBWIC)
	Aluminium Skin (Bottom)	Reference	Alloy 3003*
		Manufacturer	Note 1
		Thickness	0.5 mm* (stated)
		Density	2700 kg/m ³ * (stated)
	Back Coat	Reference	Note 1
		Manufacturer	Note 1
		Colour	Brown (observed by TBWIC)
		Dry Film Thickness	15 µm* (stated)
		Dry Density	1700 kg/m ³ * (stated)
Specimen Placement	A minimum of three test specimens were tested using the crucible method in accordance with Clause 7.9 of BS EN ISO 1716:2018 test standard.		

Note 1: The sponsor was unable to provide this information



THOMAS BELL-WRIGHT
INTERNATIONAL CONSULTANTS

Test Report Ref. No. YA178-3

6. SPECIMEN VERIFICATION

TBWIC Testing Laboratory has not been involved in the selection or design of the specimen. However, the samples were selected, marked, and signed by a representative from TBWIC Certification Division (Certification Body) on 30-Apr-24 as shown below. The results apply to the samples as received.



Note: There are contexts where information has been provided by the sponsor and verification of information has been done through either technical datasheet or other document submission, or as indicated directly by the sponsor. For this reason, materials have been tested in an as-received condition and TBWIC bears no liability for the legitimacy of the submitted information.

7. SPECIMEN PREPARATION PROCEDURE

In accordance with section 7.2 of BS EN ISO 1716:2018, a minimum mass of 50g was taken from the substantial components of the non-homogenous product. A minimum mass of 10g was taken from the non-substantial components of the non-homogeneous product.

The samples were prepared as per sections 7.2.2, 7.2.3, and 7.2.4 of BS EN ISO 1716:2018. Samples were ground and reduced to small granules and treated as powder as per section 7.4 of BS EN ISO 1716:2018.

8. METHOD OF TEST

8.1. Test Procedure

The test was carried out using the crucible method in accordance with Clause 7.9 of BS EN ISO 1716:2018 test standard - *Reaction to fire tests for products - Determination of the Gross Heat of Combustion (Calorific Value)*.

The combustion was facilitated using a combustion aid, benzoic acid; an additional combustible substance of known and high calorific value. The water equivalent (E) of Bomb 1 was 0.005702 MJ/K & Bomb 2 was 0.005685 MJ/K, as per the latest calibration.

In accordance with section 8.3 of BS EN ISO 1716:2018, Aluminium or other metallic component of the product was not tested in the bomb calorimeter, as it carries the risk of serious injury to the operator due to overheating and/or overpressure causing the bomb calorimeter to explode.

8.2. Conditioning

After delivery on 10-May-24, the specimen was conditioned at 21 to 25 °C and 45 to 55% relative humidity in accordance with EN 13238:2010, *Reaction to fire tests for building products - Conditioning procedures and general rules for selection of substrates*.

Note: There were deviations observed in the temperature and relative humidity in 4 separate probes of thermo-hygrometer in our conditioning room. However, the average values were within standard limits.



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Test Report Ref. No. YA178-3

9. SUMMARY OF RESULTS

The test specimen has been evaluated in accordance with BS EN ISO 1716:2018, *Reaction to fire tests for products - Determination of the Gross Heat of Combustion (Calorific Value)*.

Deviations: There were no deviations from the test standard.

9.1. Tabulated data

The complete test results are:

Gross Calorific Value of Each Layer

		Top Coat (Silver)	Primer	Adhesive 80µm	Core	Adhesive 40µm	Back Coat	Aluminum Skins
	No. of Tests:	3	3	3	3	3	3	-
Test 1	Specimen weight (g)	0.1000	0.1003	0.1002	0.1000	0.1004	0.1001	-
	Gross calorific value (MJ/kg)	22.8	18.4	44.0	-1.3	45.3	21.7	-
Test 2	Specimen weight (g)	0.1001	0.0999	0.1001	0.1001	0.0999	0.1000	-
	Gross calorific value (MJ/kg)	22.5	18.7	44.1	-1.0	45.2	21.5	-
Test 3	Specimen weight (g)	0.1001	0.0999	0.1002	0.1002	0.0998	0.1000	-
	Gross calorific value (MJ/kg)	23.1	18.5	44.1	-1.4	44.1	21.6	-
Average Gross calorific value (QPCS) in MJ/kg		22.8	18.5	44.1	-1.2	44.9	21.6	-
Area Weight (kg/m ²)		0.04*	0.01*	0.07	6.0	0.03	0.03*	-
Average Gross calorific value in MJ/m ²		0.9	0.2	3.1	0.0	1.3	0.6	0



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Test Report Ref. No. YA178-3

Gross Calorific Value of the Product

Layer	Component		Thickness (mm)	Area density (kg/m ²)	Gross Heat of Combustion Q _{gr,cs} (MJ/kg)	Gross Heat of Combustion Q _{gr,cs} (MJ/m ²)	
1	Component 1 (External non-substantial layer)	Top coat (Silver)	0.02*	0.04*	22.8	0.9	1.1
		Primer	0.007*	0.01*	18.5	0.2	
2	Component 2 (Substantial layer)	Aluminum Skin (Top)	0.5*	1.35	0	0	
3	Component 3 (Internal non-substantial layer)	Adhesive	0.08	0.07	44.1	3.1	
4	Component 4 (Substantial layer)	Core	3.0*	6.0*	0	0	
5	Component 5 (Internal non-substantial layer)	Adhesive	0.04	0.03	44.9	1.3	
6	Component 6 (Substantial layer)	Aluminum Skin (Bottom)	0.5*	1.35	0	0	
7	Component 7 (External non-substantial layer)	Back Coat	0.015*	0.03*	21.6	0.6	
(A) Sum of calorific values, MJ/m ²						6.0	
(B) Sum of Area weights, kg/m ²						8.735	
Gross heat of combustion of the whole product (PCS), in MJ/kg: Q _{gr,cs} (A/B)						0.7	

9.2. Observations

In accordance with Section 8.3.11 of BS EN ISO 1716:2018, specimens were observed to be completely combusted.



THOMAS BELL-WRIGHT
INTERNATIONAL CONSULTANTS

Test Report Ref. No. YA178-3

10. VALIDATION OF THE TEST RESULTS

To be validated, the test results shall comply with the criteria specified in Clause 11 of BS EN ISO 1716:2018. The following criteria apply.

Gross heat of combustion	Acceptance criteria	Range of validity
Q_{net} (MJ/kg)	≤ 0.2 MJ/kg	From any negative value to 3.2 MJ/kg
	Within 5% of the average of the 3 results	From 3.2 MJ/kg to 20.0 MJ/kg
	Within 10% of the average of the 3 results	Greater than 20.0 MJ/kg
Q_{net} (MJ/m ²)*	≤ 0.1 MJ/m ²	From any negative value to 4.1 MJ/m ²
	Within 5% of the average of the 3 results	From 4.1 MJ/m ² to 20 MJ/m ²
	Within 10% of the average of the 3 results	Greater than 20 MJ/m ²
* For non-substantial components only.		

10.1. Validity

The differences between the maximum and minimum Q_{net} values were within the range of validity specified in Clause 11 of BS EN ISO 1716:2018.

11. LIMITATION

"The test results relate to the behavior of the test specimens of a product under the particular conditions of the test; they are not intended to be the sole criterion for assessing the potential fire hazard of the product in use." - Clause 10q of BS EN ISO 1716:2018 test standard.

This report and all records of the test to which it relates may not be retained by TBWIC further than 5 years from the date of testing.

This test report is respectfully submitted by: Thomas Bell-Wright International Consultants

Tested & Prepared by:


Sally Fleming
Fire Testing Engineer



Reviewed and Authorized by:


Malak Megly
Fire Testing Engineer

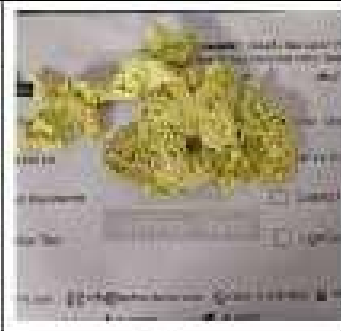
Report Revision Tracking		
Revision No.	Date Issued	Notes & Amendments
Rev. 00	03-Jul-24	This is the first issue of the report. No revisions are included.



THOMAS BELL-WRIGHT
INTERNATIONAL CONSULTANTS

Test Report Ref. No. YA178-3

12. SAMPLE PHOTOS

		
PVDF Top Coat, Silver	Back Coat	Primer
		
Core	80µm Adhesive	40µm Adhesive

— End of Test Report —

• ISO CERTIFICATES



Certificate of Registration (Occupational Health & Safety Management System)

QFS MANAGEMENT SYSTEMS LLP

This is to Certify that the Occupational Health & Safety Management System of

ALWAH ALMALHEM TRAINING COMPANY

ALAMID STREET, ALMALIYAH DISTRICT, EAST YAMEN, SAUDI ARABIA

is in accordance with the requirement of the Occupational Management System Standard detailed below

ISO 45001:2018

This certificate is valid for the following product or service range

MAINTENANCE OF FIRE SAFETY EQUIPMENT AND SYSTEMS

Certificate Number: QFS/MS/17/0001

1st Surv. Due on: 14.11.2019

Initial Date of Certification: 14.11.17

2nd Surv. Due on: 14.11.2019

Date of Certificate: 14.11.17

Date of Expiry: 14.11.2019

Director:

Date: 14.11.2017



The validity of certificate is subject to regular surveillance audits over before above mentioned dates and its only valid when successful surveillance with certification term issued by QFS is below subject to the continued credibility of business at any time and without notice to the above named organization's premises for the purpose of assessment and surveillance regarding the standard named above and QFS terms and conditions.

QFS MANAGEMENT SYSTEMS LLP

QFS PL, New Delhi, India 110017, India

www.qfsindia.com

email: info@qfsindia.com

Approved by Standards Council of Canada



• ISO CERTIFICATES



Certificate of Registration

(Environmental Management System)

QFS MANAGEMENT SYSTEMS LLP

This is to Certify that the Environmental Management System of

ALWAH ALKHALIL TRADING COMPANY

ALAMID STREET, ALWASALIYAH DISTRICT, RAS AL KHAYMA, EMIRATI, SAUDI ARABIA

is in accordance with the requirements of the Environmental Management System Standard detailed below

ISO 14001:2015

This certificate is valid for the following product or service range:

MANUFACTURING OF FIRE RATED ASBESTOS CEMENT ROOFING PANELS.

Certificate Number: SCC/IN/017/14001/2015

1st Surv. Due on: 19.11.2018

Initial Date of Certification: 19.11.2017

2nd Surv. Due on: 19.11.2018

Date of Certificate: 19.11.2017

Date of Expiry: 19.11.2019

Director:



Date: 19.11.2017



The validity of certificate is subject to regular surveillance audit on or before above mentioned dates and its only valid if the surveillance audit is successful with overall rating better than 2.0. It is issued subject to the annual recertification of access at any time and without notice to the above named organization's premises for the purpose of assessment and surveillance regarding the standard named above and QFS terms and conditions.

QFS MANAGEMENT SYSTEMS LLP

107/25, Sector 16, Gurgaon City - 122 002

www.qfsmgmt.com

e-mail: admin@qfsmgmt.com

Accredited by Standards Council of Canada

• ISO CERTIFICATES



Certificate of Registration

(Quality Management System)

QFS MANAGEMENT SYSTEMS LLP

This is to Certify that the Quality Management System of

ALWAT ALKHALEED TRADING COMPANY

ALAMID STREET, ALMADINAH DISTRICT, EXIT 10, KHALEED, SAUDI ARABIA

Has been found to be of the Quality Management System Standard

ISO 9001:2015

This certificate is valid for the following product or service range

MANUFACTURING OF FIRE PROTECTED FIBERGLASS REINFORCED PLASTER

ISSUED BY

Certificate Number: QFS/MDT/HA/00011

1st Sur. Due on: 19.11.2024

Initial Date of Certification: 1.11.2022

2nd Surv. Due on: 19.11.2024

Date of Certificate: 1.11.2022

Date of Expiry: 19.11.2024

Director:

Date: 1.11.2022



ISO Accredited
QFS/MDT



The validity of certificate is subject to regular surveillance audit once before above mentioned date and its only valid after successful surveillance with satisfaction letter issued by QFS. It is bound subject to the economical and liability of assets at any time and without notice to the above named organization's premises for the purpose of assessment and surveillance regarding the standard named above and QFS's terms and conditions.

QFS MANAGEMENT SYSTEMS LLP

ADD: AL Basmal, Madinat Al Madinah, Jeddah
www.qfsbahrain.com
email: admin@qfsbahrain.com

Accredited by Standards Council of Canada



• LEED CERTIFICATES



Abwah Alshakeel Industrial Co. Member ID#00917 | 0888 | 40421



LEED

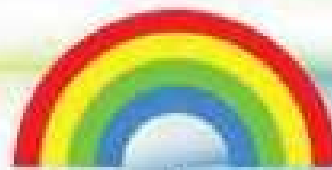
Techno-Bond products directly support the LEED (Leadership in Energy and Environmental Design) Green Building Rating System developed by the U.S. Green Council



Color your world

• **Beckers-Spectrum CERTIFICATES**

**APPROVED COIL COATER
LICENSE CERTIFICATE - 2022**



**Beckers
Appoints**

ALWAH AL KHALEEJ FACTORY (TECHNOBOND)

As our 'Approved Applicator' for application of Beckry Pol 100 (Polyester)
Beckry Tech 100, 1A00 (HDPE), Beckry Fluor 1T (PVDF – KYNAR 500® PSF® Plus)
Beckry Flon (FEVE), Beckry Coat V1 (Backcoat) products.

All the above products supplied by Beckers are coated in their factory in full compliance as per ASTM or ECCA norms. The above mentioned paint system provide to ALWAH AL KHALEEJ FACTORY (Technobond) after continuous evaluation at Becker Industries.



Becker Industrial Coatings L.L.C

Becker Industrial Coatings L.L.C
P.O.Box 12795
Warehouse 2-0, Al-Khaur Port
Ras Al-Khaima
UAE

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E-mail : Santosh.jose@beckers-group.com
Website: www.beckers-group.com

Mother Company
Becker Industrie
40 rue du Champ de Mars - B.P.34
42601 Montbrison Cedex - FRANCE
Phone : +33 (0) 4 77 88 70 50

ARKEMA INNOVATIVE MATERIALS FOR A SUSTAINABLE WORLD

KYNAR500®FSF®

POLYVINYLIDENE FLUORIDE BASED COATINGS

LICENSE CERTIFICATE



BECKER INDUSTRIAL COATINGS, L.L.C.

Has successfully met all requirements set forth by Arkema Inc. and has been licensed to produce coatings in United Arab Emirates with 100% KYNAR 500®FSF® PVDF resin for the year 2022. The coating shall maintain a minimum of 70% PVDF resin content.



Paul JAVALEE
GLOBAL MARKETING MANAGER

Kynar®, Kynar 500®, and FSF® are registered trademarks belonging to Arkema Inc. Coating formulation based on Kynar 500®FSF®PVDF resin can only be registered by Arkema Inc. or its affiliates. Product sold by Beckers shall not include any composition other than Kynar 500®FSF®PVDF resin.


**AGC CHEMICALS EUROPE
COMMERCIAL CENTRE**

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email: info@agcagurope.com
www.agc.com

Date: 17-07-2018

Dear Sirs,

This is to confirm that Spectrum Dubai has been buying our Lumiflon resins since a few years. To my understanding, Spectrum do not buy FEVE resins from other producers.

It would be our pleasure to deliver our Lumiflon resins to Spectrum, for Spectrum to produce the Lumiflon based coatings for the Riyadh Metro project.

Please let me know if I can be of further help.

Best regards

Ben Runhaar

Product & Marketing Manager Lumiflon

R.R.

AGC Chemicals Europe Commercial Centre is a branch of AGC Chemicals Europe Ltd. Registered in England No. 1825167
Registered Office: PO Box 4, Millhouse International, Thornton (Derby), Pk 400, UK.



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BS 476: Part 7: 1997



Method For Classification Of The Surface Spread Of Flame Of Products

A Report To: Becker Industrial Coatings LLC

Document Reference: 570231

Date: 11th January 2017

Issue No.: 2

Page 1

Testing
Advising
Assuring

Registered Office: Exova (UK) Ltd, Lichfield Industrial Estate, Fenestry, Walsley, S62 8PL, United Kingdom. Reg No: SC 10026
This report is issued in confidence and its use is restricted. A copy of which is available on request.



6049



Date : 31/5/2016

PVDF 2-COAT AAMA 3605-05 COMPLIANCE CERTIFICATE

ARCHITECTURAL MATERIAL SPECIFICATIONS - PROPRIETARY COATING PAINT IN PVDF	
The Beckers-Techno PVDF system is formulated with 70:30 ratio of PvdF: Acrylic. PvdF binder in this coating shall consist 70% Polyvinylidene Fluoride (PvdF) Kynar 500 resin for excellent outdoor durability, formability and chemical resistance. Paint system shall comply to American Architectural Manufacturers Association (AAMA) 3605-05 High Performance Organic Coatings on Cold-Cooled Architectural Aluminum Substrate.	
COATING THICKNESS	
PVDF PRIMER	- 5 – 7 µm
PVDF TOP COAT	- 18 – 20 µm
TOTAL THICKNESS	- 23 – 25 µm

ARCHITECTURAL MATERIAL SPECIFICATIONS - PROPRIETARY COATING PAINT IN PVDF (PERFORMANCE SPECIFICATIONS)		
Tests	AAMA 3605-05 Requirements	Beckers-Techno PVDF coating System Performance
Colour Uniformity (ASTM D2244)	Consistent with colour range	Complied
Gloss (ASTM D523 @ 60°)	Low, Medium, to High	Gloss Range : 25 - 85 unit
Pencil Hardness (ASTM D3363) Barcol Light Response	H & minimum hardness	Complied
Film Adhesion (11.4 L arm cross hatch)		
1) Dry Adhesion (23°C - 27°C)	100% Adhesion	Excellent - No Removal
2) Wet Adhesion (23°C @ 24 hour/s)	100% Adhesion	Excellent - No Removal
3) Boiling Water Test (23°C - 130°C @ 20 min)	100% Adhesion	Excellent - No Removal
Reverse Impact Resistance - Adhesion Impact	Load = 1.5 * metal thickness	Excellent - No Removal
Coating Flexibility - T-Bend (ASTM A4145)	2T NR, Minor cracking permissible	Complied
Abrasion Resistance (ASTM D660)	Abrasion Coeff : 40 sec/mil minimum	Complied
Chemical Resistance		
1) Muriatic Acid Resistance (15 mins Spot Test)	No blister and visual change	Complied
2) Muriatic Resistance (24 hours Pot Test)	No adhesion loss or visual change	Complied
3) Nitric Acid Resistance (30 min Vaporour Test)	Delta E < 5.0 (Acceptable)	Complied
4) Detergent Resistance (72 hours Immersion Test)	No adhesion loss or visual change	Complied

Beckers Group
Beckers Industrial Coatings LLC
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Bag. Al Khaima, U.A.E.

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Fax : +971 (0)2 2776651
info.raa@beckers-group.com
www.beckers-group.com





Date : 31/03/2016

PVDF 3-COAT AAMA 2605-05 COMPLIANCE CERTIFICATE

ARCHITECTURAL MATERIAL SPECIFICATIONS - PROPRIETARY COATING PAINT IN PVDF	
The BeckersHycoat® PVDF system is formulated with 70/30 ratio of PVDF /Acrylic /PVDF binder in this coating shall contain 70% Polymers (Polyvinyl Fluoride (PVDF) Resin 500 resin for excellent outdoor durability, formability and chemical resistance. Paint system shall comply to American Architectural Manufacturers Association (AAMA) 2605-05 High Performance Organic Coatings on Co) Coated Architectural (Aluminum Substrates).	
COATING THICKNESS	
PVDF PRIMER	5 – 7 µm
PVDF TOP COAT	18 – 20µm
PVDF CLEAR COAT	13 – 15µm
TOTAL THICKNESS	36 – 42µm

ARCHITECTURAL MATERIAL SPECIFICATIONS - PROPRIETARY COATING PAINT IN PVDF (PERFORMANCE SPECIFICATIONS)		
Tests	AAMA 2605-05 Requirements	BeckersFluor 600 PVDF coating System Performance
Colour Uniformity (ASTM D2244)	Consistent with colour range	Complied
Specular Gloss (ASTM D523 @ 60°)	Low, Medium, to High	Gloss Range : 25 - 35 unit
Pencil Hardness (ASTM D3359) Hard Eagle Turntable	HB minimum hardness	Complied
Flex Adhesion (13 x 1 mm cross hatch)		
1) Dry Adhesion (30°C - 27%)	100% Adhesion	Excellent - No Removal
2) Wet Adhesion (30°C @ 24 hours)	100% Adhesion	Excellent - No Removal
3) Boiling Water Test (99°C - 100°C @ 30 min)	100% Adhesion	Excellent - No Removal
Reverse Impact Resistance : Adhesion Impact	Load = 1.5 T metal thickness	Excellent - No Removal
Coating Flexibility : T-Bend (ASTM D145)	27 NB, Minor cracking permissible	Complied
Abrasion Resistance (ASTM D968)	Abrasion Coat / 40 tons/mil minimum	Complied
Chemical Resistance		
1) Muriatic Acid Resistance (15mins Spot Test)	No blister and visual change	Complied
2) Mineral Resistance (24 hours Pot Test)	No adhesion loss or visual change	Complied
3) Nitric Acid Resistance (30min Vapour Test)	Delta E < 5.0 (Hunterlab)	Complied
4) Detergent Resistance (72 hours Immersion Test)	No adhesion loss or visual change	Complied

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www.beckers-group.com



Date : 13/8/2016

PVDF 4-COAT AAMA 2605-05 COMPLIANCE CERTIFICATE

ARCHITECTURAL MATERIAL SPECIFICATIONS - PROPRIETARY COATING PAINT IN PVDF	
The BeckersFluor 630 PVDF system is formulated with 70/30 ratio of PVDF Acrylic; PVDF binder in this coating shall consist 70% Polyvinylidene Fluoride (PVDF) Resin. 300 tests for excellent outdoor durability, formability and chemical resistance. Paint system shall comply to American Architectural Manufacturers Association (AAMA) 2605-05 High-Performance Organic Coatings on Coil Coated Architectural Aluminum Substrates.	
COATING THICKNESS	
PVDF PRIMER	~ 5 – 7 µm
PVDF BARRIER COAT	18 – 20µm
PVDF TOP COAT	18 – 20µm
PVDF CLEAR COAT	~ 18 – 20µm
TOTAL THICKNESS	~ 50 – 67µm

ARCHITECTURAL MATERIAL SPECIFICATIONS - PROPRIETARY COATING PAINT IN PVDF (PERFORMANCE SPECIFICATIONS)		
Tests	AAMA 2605-05 Requirements	BeckersFluor 630 PVDF-coating System Performance
Colour Uniformity (ASTM D2244)	Consistent with colour range	Complied
Specular Gloss (ASTM D523 @ 60°)	Low, Medium, to High	Gloss Range : 30-40 units
Pencil Hardness (ASTM D3363) (B and C type Turquoise)	Hill minimum hardness	Complied
Film Adhesion (11 x 1 mm cross hatch)		
1) Dry Adhesion (10°C - 27°C)	100% Adhesion	Excellent - No Removal
2) Wet Adhesion (38°C @ 24 hours)	100% Adhesion	Excellent - No Removal
3) Boiling Water Test (90°C - 100°C @ 30 mins)	100% Adhesion	Excellent - No Removal
Reverse Impact Resistance : Adhesion Impact	Load = 1.5 * metal thickness	Excellent - No Removal
Coating Flexibility : T-Bend (ASTM A145)	2T NR, Minor cracking permissible	Complied
Abrasion Resistance (ASTM D3968)	Abrasion Coeff : 40 mg/mil minimum	Complied
Chemical Resistance		
1) Hydrochloric Acid Resistance (15 mins Spot Test)	No blister and visual change	Complied
2) Mortar Resistance (24 hours Pot. test)	No adhesion loss or visual change	Complied
3) Nitric Acid Resistance (10 mins Vapor test)	Delta E < 5 % (Hamberich)	Complied
4) Detergent Resistance (72 hours Immersion Test)	No adhesion loss or visual change	Complied

Beckers Group
Beckers Industrial Coatings LLC
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Mekong Port - Weng Co. 2118
Ban Nakhon Phanom U.A.E.

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www.beckers-group.com





Date: 28/06/2018

To,

M/s Alweh Alkaleej Factory
Riyadh,
Kingdom of Saudi Arabia.

Dear Sir,

Spectrum Industries is a leading and specialized paint manufacturer in the Middle East for Coil, Can, Extrusion and Ultratec coating systems. Spectrum Industries has been established in 2004, as an organization we are a part of Ghobash group.

Spectrum Industries is the first global licensee for Kynar Aquatex-Arkema USA and also the first and only licensee for Kynar Aquatex in EMEA with exclusivity for Middle East and India. We are the first paint company in the Middle East to have KYNAR500 PSF license to produce PVDF coatings from Arkema-USA.

Spectrum Industries has a state of art manufacturing facility in Dubai Investment Park and has specialized itself in the production of Coil Coatings, Can Coatings, Extrusion Coatings and Ultratec Coatings. The plant is well equipped and has a total Production Capacity of 10,000.00 Tons/annum and also five dispensing units at various customer sites.

Spectrum Industries meets the international standards of coating systems for coil coating application as set by ECCA (European Coil Coating Association), ASTM, ANMA and NCCA (National Coil Coating Association). The company is set up with state-of-the-art testing laboratory in order to ensure the compliance of our products to set standards.

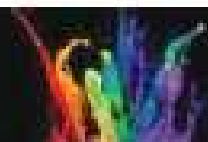
Following are some of our prestigious and iconic projects where we have supplied PVDF paints.

- Riyadh Metro
- Jeddah Airport
- Dubai Metro
- Dubai Airport
- Qatar Metro
- Grand Mosque Abu Dhabi

Regards,


Chandrasekhar Nayak,
Spectrum Industries LLC





TECHNICAL DATA SHEET

PVDF ULTRANAR TOPCOAT BLUE (3-COAT) (SI - 14124)

Ultranar 500 Coatings is a poly(vinylidene difluoride) resin (KYNAR 500 F5F) based finish containing high performance pigments. It has excellent resistance against weathering, corrosion, hardness, chemicals and abrasion. Meets or exceeds the requirements of AAMA 2605 - 98 specification. It is specially designed for roller (Coil) coating application.

Paint - Liquid Properties:

Viscosity	100 - 140 secs Ford 4 cup @ 30°C	ASTM D 1200 - 84
Specific Gravity	1.14 - 1.24 gms/cc	ASTM D 1475 - 98
Solids by weight	46 - 54 %	ASTM D 2369 - 98
Solids by Volume	30 - 36 %	Internal Calculation Method
Coverage	240 - 290 SqM / Kg / μ	Internal Calculation Method
Storage	6 months	

Application:

Primer	Polyurethane Primer, CPU 701
Primer Dry Film Thickness	6 - 8 microns
Cure Temperature range	232°C - 241 °C
Topcoat	PVDF ULTRANAR TOPCOAT BLUE - SI- 14124
Topcoat Dry Film Thickness	18 - 21 microns
Cure Temperature range	241°C - 249 °C
Clear Coat	FEVE CLEAR COAT
Clear coat Dry Film Thickness	16 - 18 microns
Cure Temperature range	232°C - 241 °C
Substrates	Pre-treated Aluminum

*** Film Properties:

*Solvent Resistance	> 100 MEK double rubs	ASTM D 5402
*T - Band Test	No Tape Off, 1T - 2T	ASTM D 4145
*Pencil Hardness	Mitsubishi Uni Pencil Minimum "F"	ASTM D 3363
*Cupping	> 6mm, NT0**	ECCA - T6
*Cross Cut Adhesion	100/100 NC, NT0**	ASTM D - 3359 - 97
*Reverse Impact	No Tape Off, 40 - 80 Inch Lbs	ASTM D 2794
*Gloss @ 60°	75 - 85 Units	ASTM D 523
*Acid Resistance(5% HCl)	24 Hrs, Pass	AAMA620
*Alkali Resistance(5% NaOH)	24 Hrs, Pass	AAMA650
QUV - B, Resistance(2000 Hrs)	Color Diff. ΔE<2	ASTM 4587-91
QUV - B, Resistance(2000 Hrs)	Gloss Retention > 85%	ASTM 4587-91
Humidity Resistance (1000 Hrs)	Pass	ASTM D 2247
Salt Spray (1000 Hrs)	Pass	ASTM B 117

* Depending on substrate gauge, quality & Number of Coating Layers

** NC = No Crack ; NT0 = No Tape Off

*** Film properties are tested on Spectrum Primer, CPU701 with SPECTRUM - OF - 301 ULTRANAR PVDF TOPCOAT + FEVE CLEARCOAT

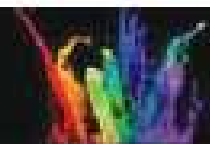
Supplied Application Layers might change based on the project location and other requirements.

The contents of this publication are based on our present knowledge and experience. Due to the number of possible variations in the processing and application of our products, these statements do not exempt the user from making his own tests and experiments. They cannot be taken as legally binding statements regarding certain properties or suitability for the particular application. Any possible patent rights as well as existing laws and provisions must be observed at the responsibility of the user.



P.O. Box - 52161, Dubai, U.A.E., Email : info@spectrumindustries.ae
Tel : +971 - 42841197, Fax : +971 - 428 477 51




SPECTRUM
INDUSTRIES LLC


TECHNICAL DATA SHEET

PVDF ULTRANAR TOPCOAT RED (3-COAT) (SI - 14115)

Ultranar 500 Coatings is a poly vinylidene di fluoride resin (KYNAR 500 PVDF) based finish containing high performance pigments. It has excellent resistances against weathering, corrosion, hardness, chemicals and abrasion. Meets or exceeds the requirements of ANMA 2505 - 88 specification. It is specially designed for roller (Coil) coating application.

Paint - Liquid Properties:

Viscosity	100 - 140 secs Ford 4 cup @ 30°C	ASTM D 1200 - 94
Specific Gravity	1.14 - 1.24 gm/cm ³	ASTM D 1475 - 99
Solids by weight	48 - 54 %	ASTM D 2369 - 88
Solids by Volume	30 - 36 %	Internal Calculation Method
Coverage	240 - 300 SqM / Kg / μ	Internal Calculation Method
Storage	6 months	

Application:

Primer	PolyUrethane Primer, CPU 701
Primer Dry Film Thickness	5 - 8 microns
Cure Temperature range	232°C - 241 °C
Topcoat	PVDF ULTRANAR TOPCOAT RED - SI- 14115
Topcoat Dry Film Thickness	19 - 21 microns
Cure Temperature range	241°C - 249 °C
Clear Coat	FEVE SPARKLE CLEAR COAT - SI - 14117
Clear coat Dry Film Thickness	14 - 16 microns
Cure Temperature range	232°C - 241 °C
Substrates	Pre-treated Aluminum

***Film Properties:

*Solvent Resistance	> 100 MEK double rubs	ASTM D 5402
*T - Bend Test	No Tape Off, 1T - 2T	ASTM D 4145
*Pencil Hardness	Mitsubishi Uni Pencil Minimum "F"	ASTM D 3363
*Cupping	> 6mm, NTO**	ECCA - T5
*Cross Cut Adhesion	100/100 NG, NTO**	ASTM D - 3359 - 97
*Reverse Impact	No Tape Off, 40 - 80 Inch Lbs	ASTM D 2794
*Gloss @ 60°	70 - 85 Units	ASTM D 523
*Acid Resistance (5% HCl)	24 Hrs. Pass	AAMA620
*Alkal Resistance (5% NaOH)	24 Hrs. Pass	AAMA620
QUV - B Resistance (2000 Hrs)	Color Diff. ΔE < 2	ASTM 4587-B1
QUV - B Resistance (2000 Hrs)	Gloss Retention > 85%	ASTM 4587-B1
Humidity Resistance (1000 Hrs)	Pass	ASTM D 2247
Salt Spray (1000 Hrs)	Pass	ASTM B 117

* Depending on substrate gauge, quality & Number of Coating Layers

** NC = No Crack, NTO = No Tape Off

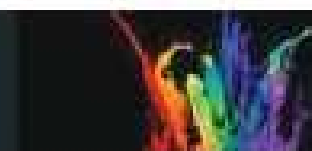
*** Film properties are based on Spectrum Primer, CPU701 with SPECTRUM - DF - 301 ULTRANAR PVDF TOPCOAT + FEVE CLEARCOAT**

† Suggested Application Layer's might change based on the project location and other requirements.

The statements in this publication are based on our present knowledge and experience. Due to the number of possible variations in the processing and application of our products, these statements do not exempt the user from making his own tests and experiments. They cannot be taken as legally binding statements regarding certain properties or suitability for the purpose or application. Any possible patent rights as well as existing laws and provisions must be observed at the responsibility of the user.



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TECHNICAL DATA SHEET

ULTRAFLO SPRAKLE FEVE CLEAR COAT (SI - 14117)

Ultraflon Coatings is a specialized Fluoro Carbon resin based finish containing high performance pigments. It has excellent resistances against weathering, corrosion, hardness, chemicals and abrasion. Meets or exceeds the requirements of AAMA 2605 - 98 specification. It is specially designed for roller (Coil) coating application.

Paint - Liquid Properties:

Viscosity	90 - 110 secs Ford 4 cup @ 30°C	ASTM D 1200 - 94
Specific Gravity	1.02 - 1.10 gm/cm ³	ASTM D 1475 - 98
Solids by weight	40 - 48 %	ASTM D 2369 - 98
Solids by Volume	50 - 58 %	Internal Calculation Method
Coverage	320 - 350 SqM / Kg / μ	Internal Calculation Method
Storage	6 months	

Application:

Primer	PolyUrethane Primer, CPU 700
Primer Dry Film Thickness	5 - 8 microns
Cure Temperature range	232°C - 241 °C
Topcoat	FEVE ULTRAFLO TOPCOAT - SI - 14115
Topcoat Dry Film Thickness	18 - 20 microns
Cure Temperature range	241 °C - 248 °C
Clear Coat	ULTRAFLO FEVE SPRAKLE CLEAR COAT - SI - 14117
Clear Coat Dry Film Thickness	15 - 18 microns
Cure Temperature range	232°C - 241°C
Substrates	Pre-treated Aluminum

***Film Properties:

*Solvent Resistance	> 100 MEK double rubs	ASTM D 5402
*T - Bend Test	No Tape Off, 1T - 2T	ASTM D 4145
*Pencil Hardness	Mitsubishi Uni Pencil Minimum "F"	ASTM D 3359
*Cupping	> 6 mm, NTO**	ECCA - T8
*Cross Cut Adhesion	100/100 NC, NTO**	ASTM D - 3359 - 97
*Reverse Impact	No Tape Off 40 - 80 Inch lbs	ASTM D 2794
*Acid Resistance(5% HCl)	24 Hrs. Pass	AAMA620
*Alkali Resistance(5% NaOH)	24 Hrs. Pass	AAMA620
QUV - B, Resistance(2000 Hrs)	Color Diff. DE-2	ASTM G587-91
QUV - B, Resistance(2000 Hrs)	Gloss Retention > 85%	ASTM G587-91
Humidity Resistance (1000 Hrs)	Pass	ASTM D 2247
Salt Spray (1000 Hrs)	Pass	ASTM B 117

* Depending on substrate gauge, quality & number of Coating Layers
 ** NC --- No Crack ; NTO --- No Tape Off

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5

Production Steps

● **Our Production Line**

We have four automatic production lines, with an annual production capacity of 8,000,000 square meters of aluminum composite panels.

Utilizing the latest innovations in ACP machine technology, our high-speed lines ensure consistent quality and outstanding product performance.

Production Technique of Techno Bond Aluminum Composite Panels

The material is spread homogeneously inside the block, as its upper and lower surfaces are joined with glue.

The composite material is initially formed by the coalescing of the top and bottom aluminum layers, the non-combustible FR core, and the adhesive under specific pressure and temperature conditions.

The thickness of the Techno Bond composite panel is determined during this process. This thickness remains constant and does not vary throughout the entire production process.

Once the Techno Bond composite panel has taken its initial shape, it is processed through heating and cooling units.

After shearing and reshaping the edges of the non-combustible FR core, the panel undergoes traction, aluminum foil covering, and stacking operations.

The entire production process is fully automated and controlled by a PLC system.

Protective Foil

The protective aluminum foil of the Techno Bond composite panel ensures that the product reaches its destination without losing any of its physical properties.

It provides high UV resistance, easy and clean disassembly, and is standardized according to RoHS.

The assembled Techno Bond composite panel must be disassembled at an angle of 180°.

The disassembly of the composite panel must be carried out within 30 days after installation is completed.

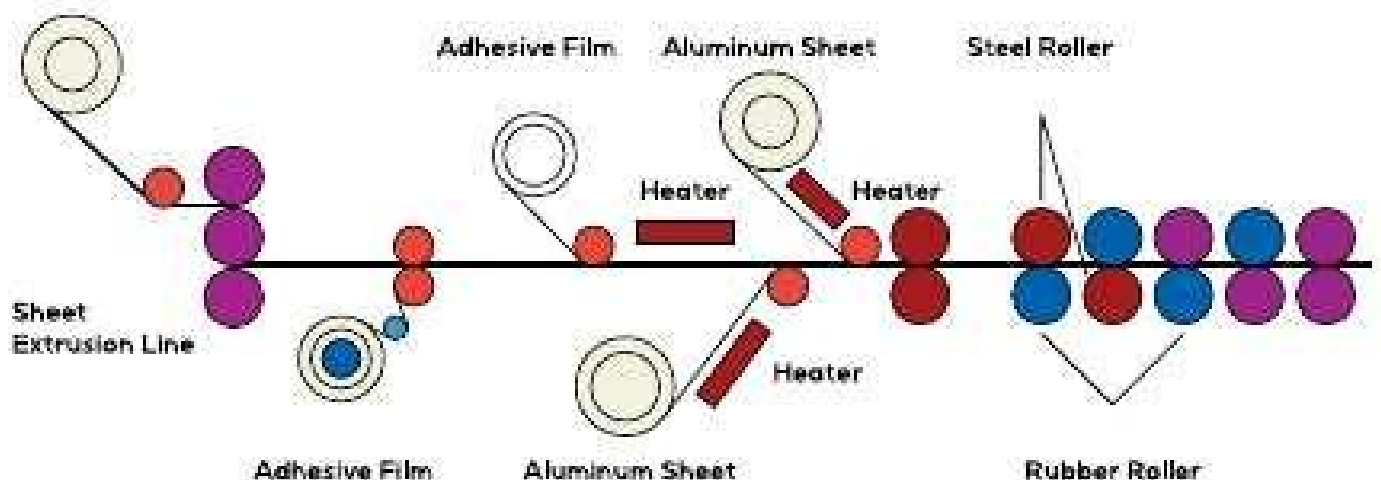


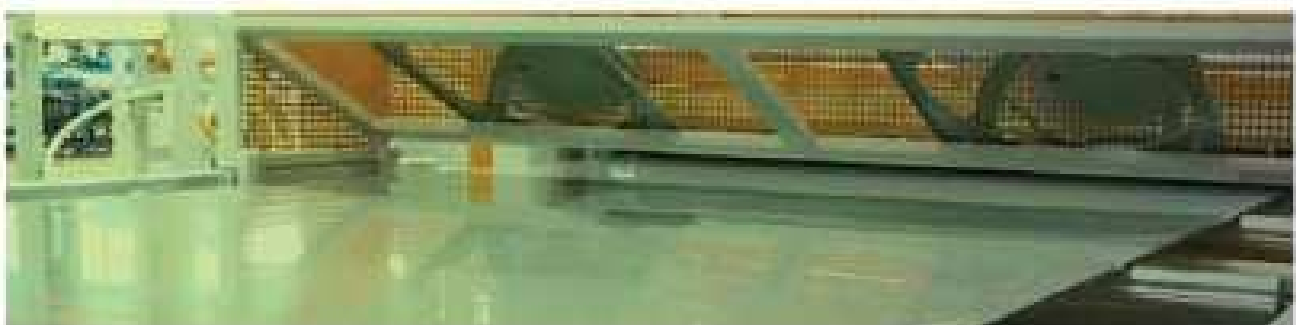
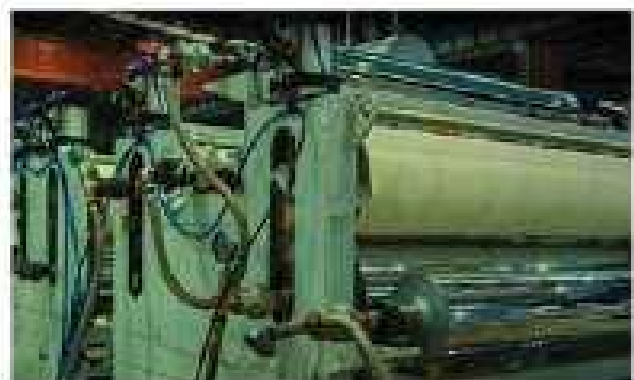
Techno Bond FR-A2 Production Steps



Typical Building Panel Lamination Line

FR A2 Core Coil





Bending Limit

FR A2 panels can be bent using a press brake or a 3-roll bending machine.

The smallest radius that can be applied without causing wrinkles on the panel's surface is known as the bend radius.

In a 3-roll machine, the bending diameter depends on the roll diameter, panel length, and the type of machine used.

Thickness	Techno Bond FR A2
4mm	100mm
6mm	120mm

6

Finishing and Colours

Techno Bond offers a wide range of colors, patterns, and finishes, in addition to custom-made colors that highlight architectural styles.

With our latest technology and cutting-edge processes, TechnoBond coating is well known for its variety of styles and durability that meet clients' needs and expectations.

Techno Bond...

	Techno Bond A2	Unit	Method
Colour change	Only slight colour change	-	ISO 16474-2:2013 Cycle 1
Gloss deviation @20	81	-	ISO 2813:2014
Coating thickness	83	µm	ISO 2360:2003
Pencil hardness	3H	-	ISO 15184:2012
Coating flexibility	No cracks	-	ISO 17132:2007
Adhesion	Grade 0	MPa	ISO 2409:2013
Impact resistance	50 (No peel off, no crack)	kg.cm	ISO 6272-2:2011
Brush resistance	10000 of No change	-	ISO 11998-2006
Stain resistance	< (5%) Resistant	-	SASO 2752
Chemical resistance	Resistant	-	SASO 2752
Alkali resistance	Resistant	-	SASO 2752
Oil resistance	Resistant	-	SASO 2752
Solvent resistance	Resistant	-	ISO 2812-2:2007
Hot water resistance			

Resistance to Liquids

5% HCl	No visible change on both front and back faces	-	ISO 2812-1:2017
5% NaOH	No visible change on both front and back faces	-	ISO 2812-1:2017
20# Engine Oil	No visible change on both front and back faces	-	ISO 2812-1:2017
3% Detergent	No visible change on both front and back faces	-	ISO 2812-1:2017

180° Peel Test

Peel strength (Length direction)	10.52	N/mm	ISO 8510-2:2006
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Types of available Paintings and Finishes Techniques

We are proudly introducing our unique, high-end, and exclusive painting factory in Saudi Arabia, offering premium-quality colors and fast delivery of both samples and materials. Using the latest techniques and methods available in the market, we provide cutting-edge painting technology with a 20-year guarantee.

We offer the most advanced techniques in the market today. Our Aluminium coil Alloy (3003/5005 series) is coated with KYNAR 500 based on polyvinylidene fluoride (PVDF), utilized with at least 70% resin, all in cooperation with Becker's French coatings.

PVDF

Polyvinylidene Fluoride (PVDF) is the most commonly used coating for commercial and industrial projects. It offers excellent resistance to weathering, chalking, and UV exposure over time.

FEVE

Similar to PVDF coatings, FEVE (Fluoroethylene Vinyl Ether) coatings deliver high durability and reliability with eco-friendly properties. They meet and exceed the requirements of AAMA 2605.

Nano Coating

Techno Bond Nano PVDF composite panels are equipped with hydrophobic and lyophobic surfaces, offering outstanding water and dirt resistance, anti-graffiti, and self-cleaning capabilities.

Anti-bacterial Coating

A PVDF-based coating enhanced with chemical agents to prevent bacterial growth on contact surfaces. It can be both passive and active in its antibacterial function.

SMP

SMP paint systems are a blend of polyester and silicon intermediates. Silicon enhances gloss retention and weather resistance, extending the coating's life.

Brush Finish Coating

A brushed finish is achieved by drawing a brush across the leveled surface, resulting in a fine, directional texture.

Texture Finish Coating

This involves adding sand or other texturizing agents to thick paint, producing varied finishes in both thickness and surface profile.

Epoxy

An epoxy coating consists of two components: an epoxy resin and a polyamine hardener (catalyst). The result is a tough, chemical-resistant surface.

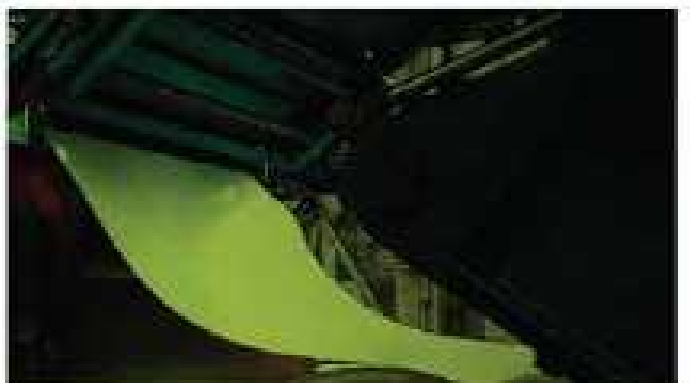
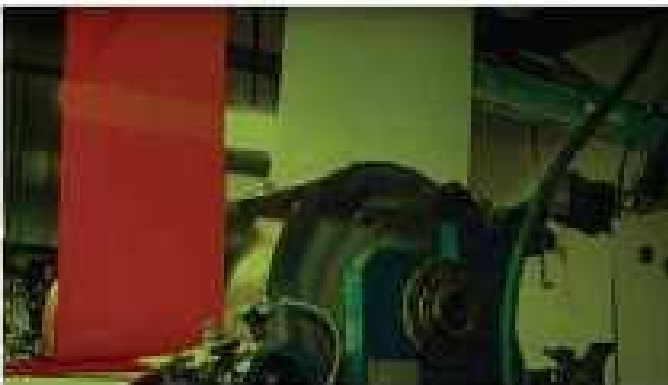
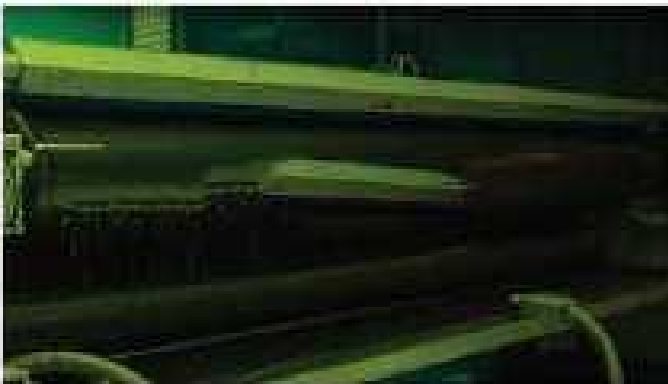
Anodized

Anodizing is an electrochemical process that transforms the metal surface into a durable, corrosion-resistant, and decorative anodic oxide finish.

PUPA

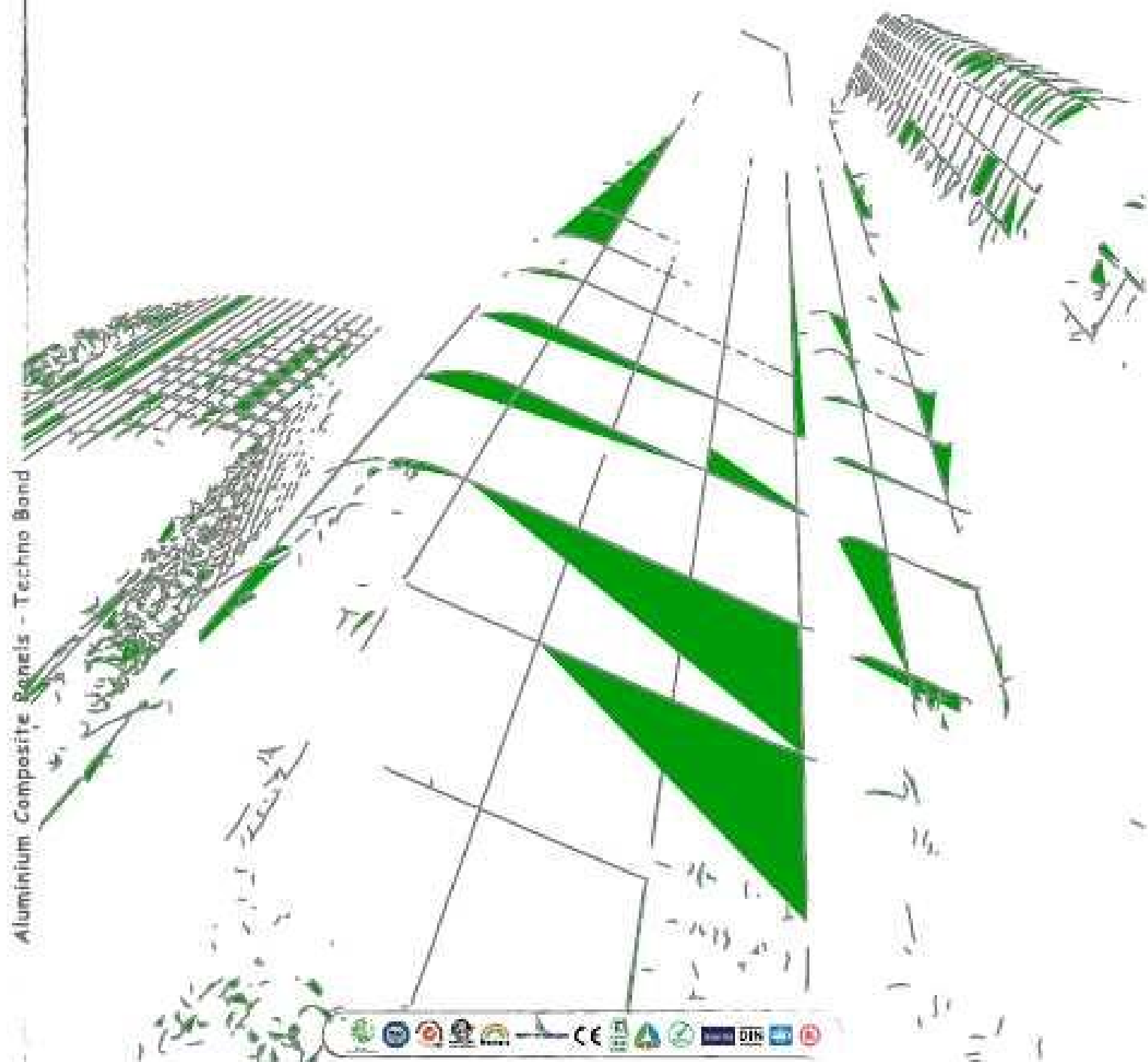
High Build PUPA coating system





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Summary of Full Test



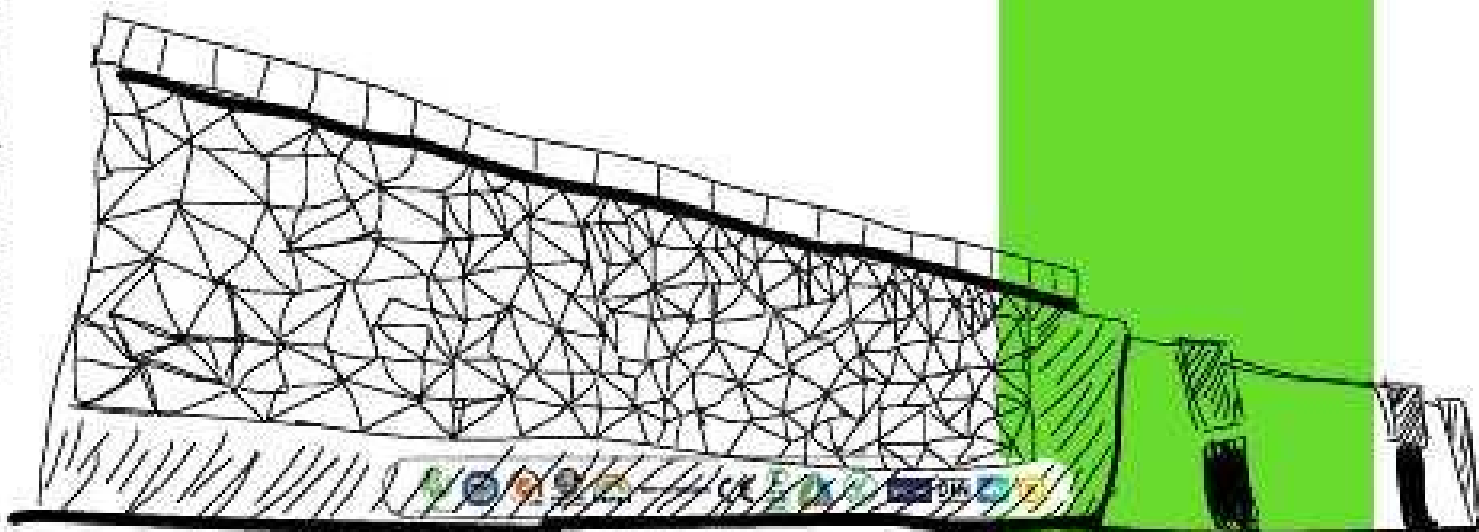


Summary of Full Tests

Full Tests	certificate
SASO Certificate	ISO 9001
	ISO 14001
	ISO 45001
Fire Behaviour Tests	ASTM E119-20
	ASTM E84
	ASTM D1929
	ASTM D635-18
	ASTM D732
	NFPA 285
	EN13501-1
Mechanical & Physical Tests	Bureau Veritas
	ISO 6361-5:2011
	EN 13832:2010+A1
	EN ISO 11925-2:2010
	ISO 6892-1:2016
	ISO 7438:2016
	ISO 16474-2:2013
	ISO 16474-2:2013
	ASTM D2244-16 ISO 2813:2014
	ISO 2630-2017
	ISO 28211:2017-Method A
	ISO 8150-2:2006
	ISO 6892-1:2016
Coating Tests	LEED
	KYNAR 500 FSF
	ARKEMA
	Beckers
	Beckry "flour 630 PVDF 3L"
	AAMA 2605
	PPG
	Spectrum
	AGC
	UV Test 2000B
	EN13501-1
Aluminum Mill finish Tests	OARK GARMCO

8

WARRANTY CERTIFICATE



شهادة ضمان لمدة عشرين عام

شركة ألواح الخليج (TECHNO BOND) FR A2 = FR2



السيد / السادة : _____ المكرم _____ الفرع / _____
اسم المشروع : _____ المندوب / _____
موقع المشروع : _____ رقم العميل / _____

»«»»»

تقر شركة ألواح الخليج (تكنوبوند) بأن منتجاتها (FR A2 - FR2) مطابقة للمواصفات العالمية وأنه مقاوم للحريق ومقاوم لتغير اللون وتفتك شرايح الألمنيوم، وجميع عيوب الصناعة على مدار عشرين عاماً من تاريخ تسليم المنتج للعميل .

Techno Bond Company Acknowledges That FR 2 - FR A2 Products is identical To The International Standards Besides Resistant To Fire, Color Change Or Any Manufacturing Defects Along Twenty Years.

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رقم الفاتورة _____ رقم اللون _____ الكمية _____ التاريخ _____ توقيع المدير العام _____



LOCATIONS



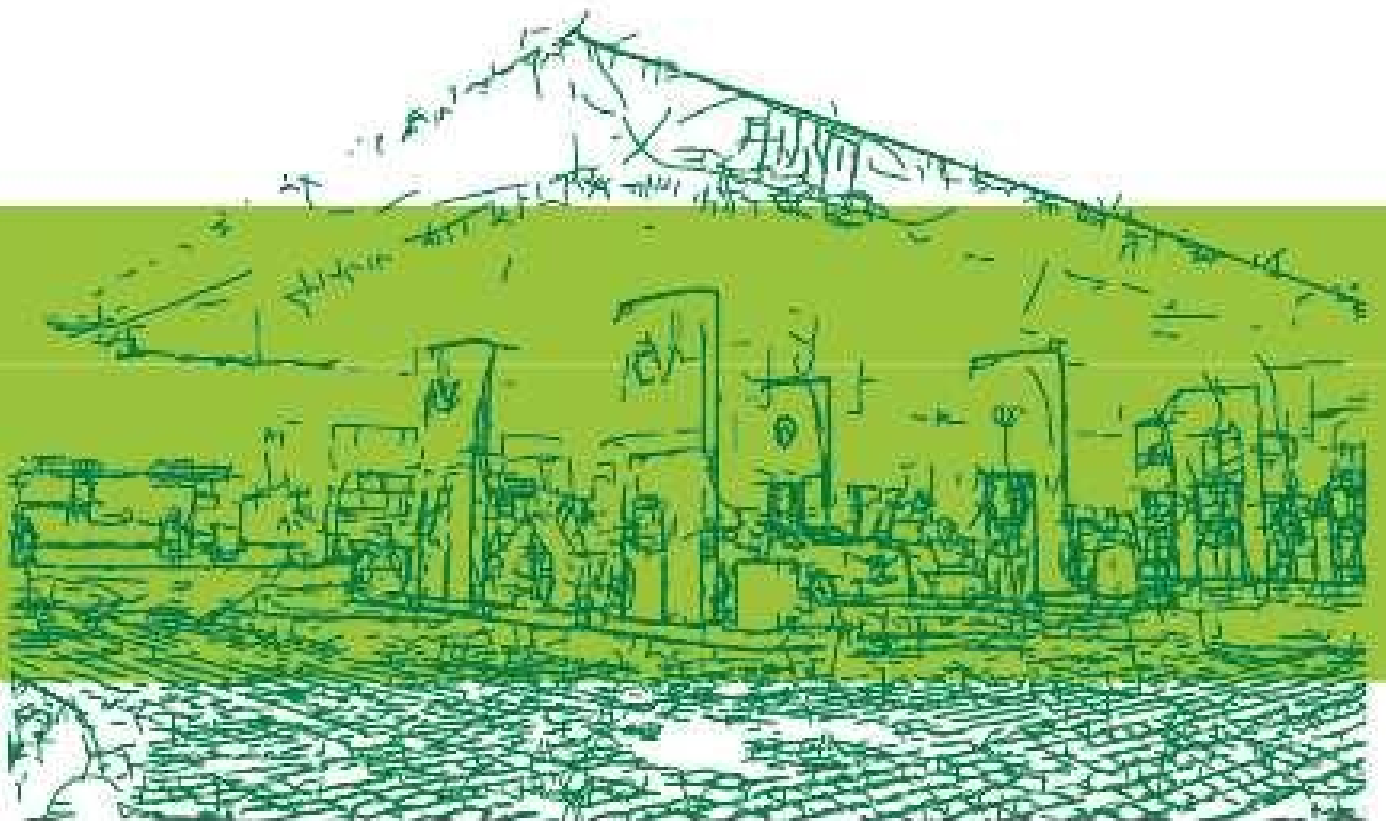


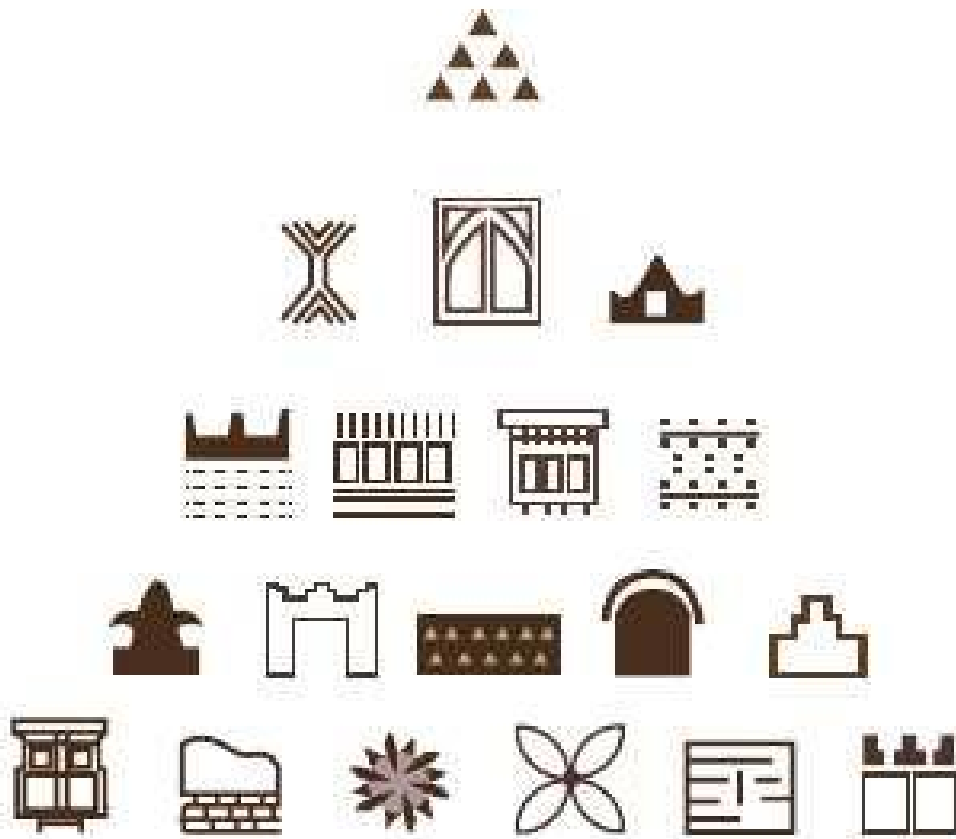
Techno Bond

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. Technobond adequately meets with all the official standards and specific criteria, naturally making it one of the most leading competitors in the market today.

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





بيانات فنية
Data Sheet - FR2-FRA2



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