

# TECHNICAL DATA

## PROBOND facadeFR®

PROBOND FacadeFR® is a Superior Construction Grade Aluminium Composite Panel designed for long term external cladding applications.

With a Kynar 500 PVDF coating PROBOND FacadeFR® offers the longest durability of any outdoor panel, and it is able to withstand the harshest climates. It has a Fire Resistant Mineral Core which meets Group1 BCA Classification requirements for external cladding. The 0.50mm aluminium skins make it perfect for folding and it maintains excellent rigidity for large panelling.



**KYNAR500®**

### Fire Rating



ISO 9705



BCA GROUP 1

#### Aluminium Skin

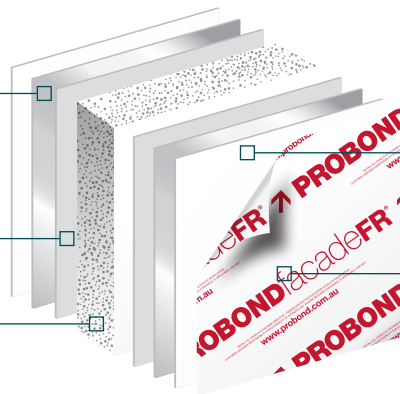
0.50mm 5005 Series Marine Grade aluminium offering superior performance, improved rigidity and excellent processing when CNC cutting and folding.

#### Adhesive

Henkel™ Hot Melt Adhesive for superior adhesion.

#### Core

White Mineral Filled Fire Resistant Core with BCA Group 1 Fire Rating



#### Paint Finish

The most durable coating available - PPG Kynar 500 PVDF Coating for long-term outdoor durability. Standard PVDF range is Satin Finish.

#### Protective Film

Designed to protect the panel during transit and installation, the film is clearly marked with the panel type for easy identification.

## ABOUT PROBOND FACADE FR

PROBOND FacadeFR® Aluminium Composite Panel offers superior levels of quality assurances with rigorous quality control monitoring throughout the manufacturing process. It is a highly versatile facade panel which is very cost-effective and suitable for many applications, even in the most complex of build requirements, challenging locations and climatic conditions.

Architects and designers will appreciate the unlimited opportunities PROBOND FacadeFR® presents for creative, innovative and individual designs and concepts.

PROBOND FacadeFR® delivers:

- High formability and stability
- Excellent weather resistance and durability
- Individual design and easy processing
- Lightweight yet rigid construction
- Large panel sizes
- Internationally tested and proven fire performance
- Easy onsite fabrication and can be pre-fabricated to architectural specifications
- Diversity of brilliant colours

## FIRE RATING, THERMAL AND INSULATION QUALITIES

PROBOND FacadeFR® boasts an Australian Fire Rated fire resistant mineral core sandwiched between two 0.50mm thick aluminium skins. It delivers high fire resistance and elevated insulation qualities, is rust-free, water resistant, durable and lightweight, making it ideal for exterior and interior cladding in new builds and retro-fitting applications.

## SURFACE COATING SYSTEM

The face of each sheet of PROBOND FacadeFR® is produced using a three-coat, three-bake system. The surface is finished with high quality fluoropolymer (PVDF) resin-based coating which provides superior protection against weathering, aging and pollution and delivers long-lasting durability with optimum UV qualities.

## 1 PRODUCT IDENTIFICATION

**Product Name:** PROBOND FacadeFR® Aluminium Composite Panel

**Intended Use:** Lightweight, fire resistant composite material for exterior and interior cladding in new builds and retro-fitting commercial and residential applications particularly where heat, cold and moisture management are desirable.

**Manufacturer:** PROBOND Architectural Australia

**Phone:** 1300 72 73 74

**Web:** [www.probond.com.au](http://www.probond.com.au)

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### 2 PRODUCT COMPOSITION AND PROPERTIES

PROBOND FacadeFR® Aluminium Composite Panel consists of a mineral filled core sandwiched two aluminium skins of 0.5mm thick, creating a rigid lightweight cladding panel.

The fire-resistant core contains carbon additives to improve durability without compromising the mechanical properties and fire performances.

The surface is finished with a PVDF (Polyvinylidene fluoride) coating which is a highly non-reactive and pure thermoplastic fluoropolymer produced by the polymerization of vinylidene fluoride.

PROBOND FacadeFR® is available in finishes of: Solid, Metallic Colors and Sparkling Colors. Lumiflon-based fluorocarbon paints are applied in PROBOND's continuous coil coating lines.

The face is protected with a self-adhesive peel-off protective film consisting of two polyethylene layers of white and black, which is capable of withstanding six months' exposure without losing its original peel-off characteristic or causing damage to panels.

Properties	
Panel Thickness (mm)	4mm
Aluminium Thickness (mm)	0.50mm
Weight (kg/m <sup>2</sup> )	7.55kg
Sound Absorption	0.05
Sound Attenuation	25
Water Absorption % by Volume	0.01
Thermal Performance R Values	0.0113
Core Composition	> 75% Magnesium Hydroxide (Mg(OH) <sub>2</sub> ) - Fire Resistant
Fire Performance*	Group 1 according to AS ISO 9705:2003
Tensile Strength of Aluminium Layers	52.5 MPa
Bending Strength	> 60 MPa
Bending Elastic Modulus	> 1.5 x 10 <sup>4</sup> MPa
Penetration Resistance	> 5.0kN
Shearing Strength	> 20.0MPa
Standard Sizes (mm)	2500mmX1575mm, 3200mmX1575mm, 4000mmX1575mm

### 3 PRODUCT DIMENSIONAL TOLERANCES

Dimensional tolerances	
Panel Thickness (mm)	4mm
Width (mm)	-0 +2 (+/- 0.2)
Length (mm)	-0 +3 (+/- 0.2)
Diagonal	-0 +5 (+/- 0.2)
Thermal Expansion	2.4mm/m @100°C temp difference
Aluminium Thickness	0.50 mm

### 4 SURFACE PROPERTIES

The surface shall not have any irregularities such as roughness, buckling and other imperfections in accordance with our visual inspection rules. PROBOND FacadeFR® is supplied with a cut edge and without aluminum sheet displacement or core protrusion.

Surface Properties	
Paint Thickness (microns)	27±1µm
Pencil Hardness	2H
Toughness of Coating	≤ 2T
Temperature Resistance	- 50°C - 80°C
Impact Strength (kg/CM <sup>2</sup> )	50kg/cm <sup>2</sup> . No crack
Boiling Water Resistance	Boiling for 2 hours without change
Acid Resistance	Immerse surface with 2%HCL(v/v) for 24H without change
Alkali Resistance	Immerse surface with 2%NaOH(m/m) for 24H without change
Oil Resistance	Immerse surface with 20# engine oil for 24H without change
Solvent Resistance	Clean 100 times with Methyl Ethyl Ketone (MEK) without change
Peel Strength	6.5 N/mm

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### 5 FIRE RESISTANCE

While many PROBOND Architectural Aluminium Composite Panels achieve the highest fire rating available to many national and international standards, the elevated properties of PROBOND FacadeFR® are such that it can be used in architectural applications requiring more stringent performance.

PROBOND FacadeFR® has a fire resistant mineral core which has obtained Australian BCA Group1 Full Scale Room Burn Classification. Extensive fire tests have been performed in accordance with applicable standards.

### SUMMARY OF FIRE TESTS

PROBOND FacadeFR® Aluminium Composite Panel has undergone rigorous testing and has met the stringent performance standards of the following tests:

- AS ISO 9705:2003
- ISO 5660-1:2015
- AS/NZS 3837-1998
- AS/NZS 1530.3-1999

Copies of test reports are available on request.

### 6 TEMPERATURE + THERMAL PROPERTIES

Due to its thin construction PROBOND FacadeFR® is not an insulating panel, however in certain situations its insulating properties can be considered. As PROBOND® can be used at temperatures between -50°C and +80°C it is ideal for a variety of challenging environmental and commercial applications.

A thermal expansion coefficient of 2.4mm/100°C needs to be considered when choosing the fixing system, fasteners and sealing. In extreme environmental situations expansion can be compensated for through the flexibility offered by the recommended adhesive tapes or by drilling oversized panel holes compared to the dimensions of the shaft of the screws, as outlined in the Installation Guidelines.

Temperature + Thermal	
Temperature resistance	-50°C to +80°C
Deflection temperature	116°C
Thermal expansion	2.4mm/100°C (temperature difference)
Thermal resistance	0.0103m <sup>2</sup> K/W
Heat transmittance coefficient U-value	5.54W/(m <sup>2</sup> K)

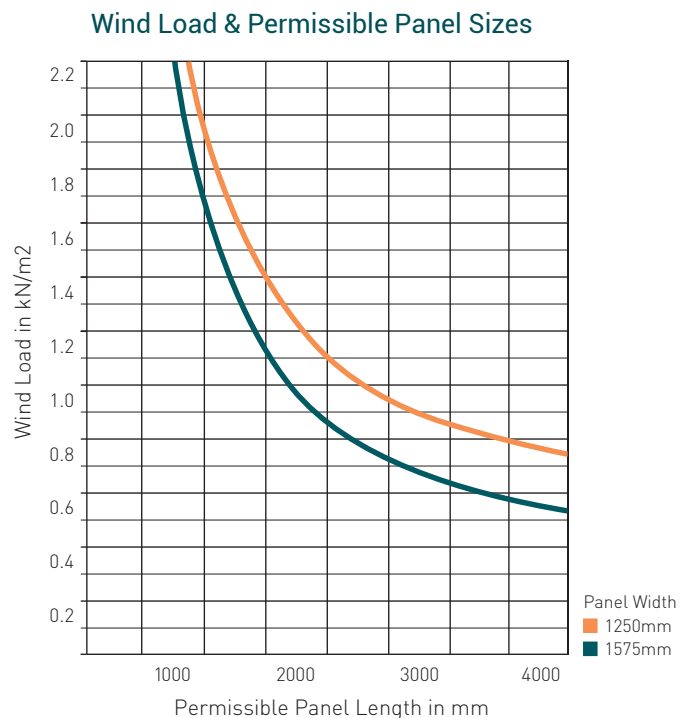
### STRUCTURAL BEHAVIOUR

PROBOND FacadeFR® delivers impressive strength-to-weight ratio across all panel sizes. Its lightweight nature allows for easy transportation, handling and fabrication.

Whilst lightweight, PROBOND FacadeFR® is extremely rigid and strong making it highly suited to exterior wall cladding under a variety of challenging environmental situations.

### 7 WIND LOAD AND PERMISSIBLE PANEL SIZES

The graph below indicates the maximum permissible panel length without having to add stiffener based on applicable design wind load and panel width. Values apply to 4-side supported panels. Permissible design stress =51N/mm<sup>2</sup> and safety factor 1.75 has been taken into account.



### 8 ACOUSTIC PROPERTIES

By the nature of its composition, PROBOND FacadeFR® offers elevated sound insulation properties making it ideally suited where sound and vibration reductions are desirable. The vibration dampening loss factor is approximately 6 times better than that of a solid aluminium sheet.

Acoustic properties	
Sound insulation	26dB (frequency range 100-3200Hz)
Sound absorption	Average = 0.05
Vibration dampening Loss factor d	0.0087 (frequency range 200Hz)

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## PROBOND facadeFR®

### COATINGS + COLOURS

#### 9 KYNAR 500® PVDF COATING

The surface of PROBOND FacadeFR® is finished high-performance Kynar 500® PVDF resin-based coatings applied in the manufacturing coil lines. Kynar 500® PVDF provides protection against weathering, aging and pollution.

The PVDF is formulated into a coating containing resin, binder and pigments. Applied to the face of PROBOND FacadeFR® as a thin layer, the paint contains a minimum of 70% by weight of Kynar 500® resin to manufacture a 70% Kynar 500® resin based coating, which meets the highest performance criteria of AAMA - 2605.

The capability of Kynar 500® resins to deliver long-lasting durability is unmatched in the industry, and is still the architect's first choice.

#### KYNAR 500® PVDF COATING PERFORMANCE

The Kynar 500® coating meets the following criteria:

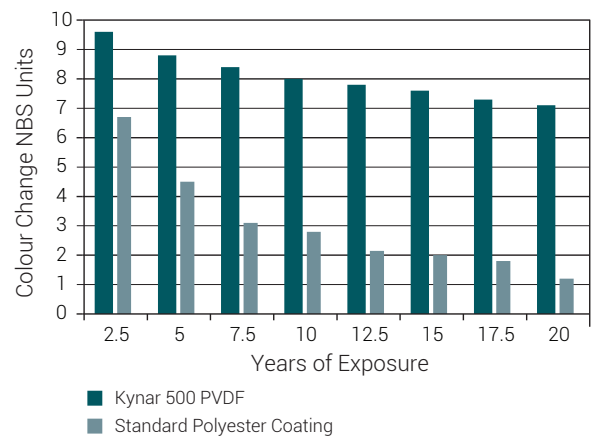
General Properties	Test	Result
<b>Gloss</b>	ASTM D523-89	30%
<b>Coating thickness</b>	ASTM D1400-2000	28.20 micron
<b>Pencil hardness</b>	ASTM D3363-05	2H
<b>Nature</b>	ISO 12086 PVDF-E, H1DN, 0.5E8.F.D.D.C.0.1	
<b>Raw appearance</b>	Fine, white powder	
<b>Purity</b>	99.5 min PVDF	
<b>Density at 23 °C</b>	ISO R 1183 D	1.76
<b>Melting point</b>	ISO 3416 C	158°C
<b>Melting flow index</b> (230°C, 21.6 Kg)	ISO 1133	4g/10mn
<b>Melting viscosity</b> (230°C, 100s-1)	ASTM D 3835	3100 Pa.s
<b>Water absorption</b>	ASTM D 570	0.04%
<b>Moisture</b>	Karl Fischer	0.5% max (non hygroscopic)
<b>Thermal decomposition</b> (1% Wt loss in air)	TGA	382-393 °C
<b>Dispersion in isophrone</b>	ASTM D 1210	6.0 - .5.5
<b>Abrasive resistance</b>	ASTM D968-93	113.4L/mil
<b>Chemical resistance</b>		
<b>Muriatic acid</b>	ASTM D1308-87	No change
<b>Sulphuric acid</b>	ASTM D1308-87	No change
<b>Sodium hydroxide</b>	ASTM D1308-87	No change

#### 10 STANDARD AND CUSTOM COLOURS

Standard colors are available as per the color chart, please contact PROBOND® Architectural to request a swatch sample for precise colour matching.

Custom colors are available for all finishes upon request and are subject to minimum quantities and extended production timelines.

Colour Change Graph



#### 11 GLOSS LEVEL

The standard finish is 40% for Solid Satin and Metallic colors.

Custom gloss levels are available between 15 and 80% on all colors upon request and are subject to minimum quantities and extended production timelines. Contact PROBOND® Architectural for your custom color and gloss enquires.

Gloss Retention Graph

