

TECHNICAL MANUAL

ULTRABOND Fire Resistant Aluminium Composite Panel

- 1. Introduction**
- 2. Quality Control**
- 3. Physical Properties**
- 4. Fire Performance**
- 5. Coating Performance**
- 6. Fabrication**
- 7. Installation**
- 8. Miscellaneous**

1.1 About This Manual:

This manual has been developed to effectively assist fabricators and contractors to work with ULTRABOND. Due to the uncontrollable conditions onsite and different methods of job scope, as well as the variable skills and judgment of installers and the quality of equipment, tools, etc, the suggestions and recommendations contained in this manual are provided without warranty. The information and recommendations herein are believed to be correct at time of publishing.

BLUECHIP reserves the right to revise the contents of this manual without prior notice. Any construction or use of the product must be in accordance with all local zoning and/or building codes and in accordance with the current NCC at the time of use. Except as contained in a written warranty certificate, the supplier does not provide any other warranty, either express or implied, and shall not be liable for any damages, including consequential damages.

1.2 Company Background:

Founded in 2003 by five brothers, BLUECHIP has grown every year since to become one of Australia's leading suppliers of architectural building envelopes. BLUECHIP's product range covers the complete system from the structure out including all types of cladding materials, composite decking, sub-framing, insulation, waterproofing and fixings.

Based in Perth WA and with many years combined experience, BLUECHIP has supplied more than 3,000,000m² of materials to Australian projects since 2003. Our commitment to innovation and ongoing investment in R&D ensures BLUECHIP will continue to lead the market with BCA/NCC compliant facade solutions in the years ahead.

For architects and consultants, BLUECHIP's wide range of different materials and 'complete-system' approach enables the creation of inspiring high-performance facades. For builders and contractors, BLUECHIP's large local stock, well established supply chains and genuine appreciation for our clients means you can trust us to deliver as promised every time.

1.3 Company Details:

Company: Blue Chip Group Pty Ltd
ABN: 98 162 282 064
Address: 6 Ashby Close, Forrestfield WA 6058
Phone: 08 9451 2344
Fax: 08 9451 8983
Email: sales@bluechipgroup.net.au

1.4 Product Description:

Introduced in 2007, ULTRABOND is a 4mm thick fire-resistant aluminium composite panel comprising of a >70% mineral filled core, sandwiched between two prefinished aluminium or other natural metal cover sheets. Utilising the renowned PVDF paint system, ULTRABOND aluminium composite panel has been thoroughly tested in Australia by NATA accredited CSIRO and Exova Warringtonfire and it is manufactured to the highest quality standards. It is also BCA/NCC compliant for all type C construction projects and has full-scale fire testing in accordance with AS 5113.

NCC 2019 Compliance

ULTRABOND fire resistant aluminium composite panel is compliant with NCC 2019 for use as external cladding on all type C construction projects ensuring you are specifying a compliant product tested to Australian standards.

AS 5113 Fire Testing

Although not required for type C construction, ULTRABOND fire resistant aluminium composite panel has been tested to AS 5113 by NATA approved Exova Warringtonfire to prove it does contribute to the spread of fire.

Unlimited Custom Colours

ULTRABOND fire resistant aluminium composite panel has unlimited colour options, we are able to match any colour from any other colour range. With small MOQ's and fast lead times you can realise your vision.

Local Stock Available

ULTRABOND fire resistant aluminium composite panel is stocked in a range of standard solid colours and metallic colours for fast delivery at all times.

PVDF Paint System

ULTRABOND fire resistant aluminium composite panel only uses the highly recognised PVDF Kynar 500 or FEVE paint systems known for their high durability and optimum resistance to weather and industrial pollution.

Low Maintenance

The ULTRABOND FR fire resistant aluminium composite panel finish has undergone 40+ years of exposure testing which is continuing to confirm the superior properties of fluoropolymer coatings.

Cost Effective

ULTRABOND fire resistant aluminium composite panel has enjoyed consistent growth not only due to the desire for a clean and modern look, but also a product offering rapid cost-effective installation.

Manufacturer's Warranty

ULTRABOND fire resistant aluminium composite panel has a long track record of consistency, reliability and quality allowing us to offer up to 15 year's warranty when installed by a licensed installer.

1.5 More Information:

<https://www.bluechipgroup.net.au/facade-cladding-perth/aluminium-composite-panel-perth.html>

2.1 Manufacturing Quality:

A dedication to the total fulfillment of our client's expectations is reflected by a complete quality control system, beginning at the point of specification and continuing through to delivery of the guaranteed products. All activities are carried out in a manner which:

- Uses the framework of ISO9000 Quality Standards to verify the quality of our systems
- Ensures that our products and services are of the highest standards
- Creates continuous improvements to our product and processes through the application of the best quality practices.

2.2 Acceptable Tolerances:

Panel Width:	+/- 3.0mm
Panel Length:	+/- 5.0mm
Thickness:	+/- 2.0%
Bow Allowed:	<0.5%
Squareness:	<5.0mm
Surface Defects:	In accordance with AAMA 2605-05

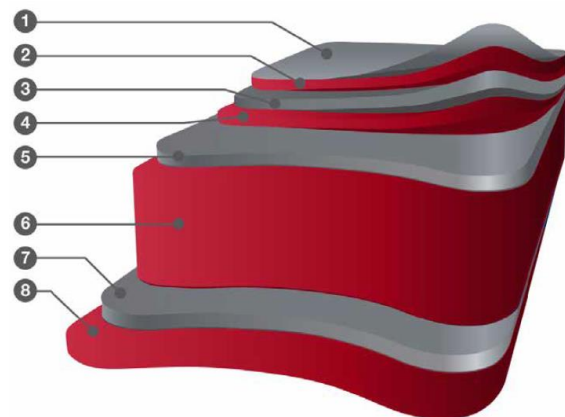
2.3 Product Warranty:

The standard product warranty is 10 years, with longer warranties available on a project specific basis. The supplier excludes all warranties in relation to the goods except for those provided in a Warranty Certificate provided to the Customer by the supplier in relation to the Goods.

A project specific full-system warranty may be available if the product is supplied with all recommended system components and fabricated and installed by a licensed installer accredited and approved by BLUECHIP in writing.

3.1 Panel Composition:

1. Peel-off Protective Film
2. Clear Coating
3. PVDF Coloured Coating
4. Primer Coating
5. 0.5mm Aluminium Face Skin
6. 3.0mm >70% Mineral Core
7. 0.5mm Aluminium Rear Skin
8. Polyester Anti-corrosion Coating



3.2 Core Composition:

The fire resistant (FR) core is >70% mineral filled, the key component being the compound Aluminium Hydroxide. ULTRABOND core material is tested and independently certified to Australian standards.

3.3 Technical Data – Physical Properties:

ITEM	TEST STANDARD	UNIT	RESULT
Thickness	Actual	mm	4.0
Panel Weight	Actual	Kg/m ²	7.6
Tensile Strength	ASTM E8	Kg/m ²	5.15
Yield Strength	ASTM E8	Kg/m ²	12.7
Flexural Stiffness (250mm Span)	ASTM C393	Kg/m ²	6.7x10 ⁸
Flexural Elasticity	ASTM C393	Kg/m ²	3666
Elongation	ASTM E8	%	7.1
Deflection Temperature at 66 PSI	ASTM D648	°C	116
Thermal Conductivity	ASTM C-518	W/mK	0.39
Thermal Expansion	Actual	mm/m/°C	0.025
Alloy Grade / Temper	Actual	-	3003 H24
Vertical Pull	ASTM C297	N/mm ²	5.9
Drum Peel	ASTM D1781	N/mm ²	368
Flat Shear	ASTM D1002	N/mm ²	6.84
Sound Isolation Rate – 500Hz	ISO 140/3	RW	26
Sound Isolation Rate – 1000Hz	ISO 140/3	RW	29
Standard Sheet Sizes			
▪ 2500 x 1570mm	Actual	m ²	3.925
▪ 3200 x 1570mm	Actual	m ²	5.024
▪ 4000 x 1570mm	Actual	m ²	6.28
Non-stock Sizes (600m ² MOQ)			
▪ 2500 x 1250mm	Actual	m ²	3.125
▪ 3200 x 1250mm	Actual	m ²	4.00
▪ 4000 x 1250mm	Actual	m ²	5.00

4.1 Technical Data – Fire Performance:

ITEM	TEST STANDARD	UNIT	RESULT
Full Panel Fire Testing*			
▪ Ignitability*	AS 1530.3	-	0
▪ Spread of Flame*	AS 1530.3	-	0
▪ Heat Evolved*	AS 1530.3	-	0
▪ Smoke Developed*	AS 1530.3	-	1
FR Core Only Fire Testing*			
▪ Ignitability*	AS 1530.3	-	11
▪ Spread of Flame*	AS 1530.3	-	0
▪ Heat Evolved*	AS 1530.3	-	2
▪ Smoke Developed*	AS 1530.3	-	1
Group Number*	ISO 9705	-	2
Full-scale Temperature Criteria*	AS 5113	°C	Pass
Full-scale Flaming Criteria*	AS 5113	No Flaming	Pass
Full-scale Openings Criteria*	AS 5113	No Openings	Pass
Full-scale Spread-of-Flame*	AS 5113	No Spread	Pass

*ULTRABOND is NOT deemed-to-satisfy non-combustible so is only compliant for type C construction projects. For non-combustible aluminium cladding panels use ULTRACORE which is DTS non-combustible in accordance with NCC 2019 and compliant for use on all buildings; <https://www.bluechipgroup.net.au/facade-cladding-perth/non-combustible-cladding-perth.html>

5.1 Paint Systems:

ULTRABOND panels use only PVDF Kynar 500 or FEVE fluoropolymer-based paint systems applied using continuous coil coating. These paint systems are known for their high durability and optimum resistance to weather and industrial pollution. More than 40 years of use globally confirms the superior chemical and physical properties of fluoropolymer coatings.

ULTRABOND coatings are applied in accordance with AAMA 2605-05, the internationally recognised paint standard for architecturally finished aluminium.

5.2 Technical Data – PVDF Kynar 500 Coating Properties:

ITEM	TEST STANDARD	UNIT	RESULT
Aluminium Substrate	ASTM D1005	-	Pass
Coating Flexibility	ASTM D4145	2T	Pass
Dry Film Thickness <ul style="list-style-type: none"> ▪ Primer Coating ▪ Coloured Coating ▪ Clear Coating (If applicable) 	ASTM D1400 ASTM D1400 ASTM D1400	Mil Mil Mil	0.2-0.3 0.7-0.8 0.3-0.4
Colour Difference	ASTM 2244	4000hrs	DE<5
Gloss Retention	ASTM 2244	4000hrs	85%
Chalking Resistance	ASTM 2244	4000hrs	<8
Pencil Hardness	ASTM D3363	-	HB
Dry Film Adhesion	Actual	38°C, 24hrs	Pass
Wet Film Adhesion	Actual	100°C, 24hrs	Pass
Reverse Impact Adhesion	ASTM D3359	1/16	Pass
Bending / Gardener Impact	ASTM D3281	-	Pass
Salt Resistance <ul style="list-style-type: none"> ▪ 5% Salt Spray @ 95°F ▪ Gloss Reduction ▪ Colour Change ▪ Chalk Resistance 	ASTM B117 ASTM D523 ASTM 2244 ASTM 4214	4000hrs 5000hrs 5000hrs 5000hrs	Pass 0.8% DE=0.68 Pass
Humidity Resistance <ul style="list-style-type: none"> ▪ 100% RH @ 95°F ▪ Gloss Reduction ▪ Colour Change ▪ Chalk Resistance 	ASTM B117 ASTM D523 ASTM 2244 ASTM 4214	4000hrs 5000hrs 5000hrs 5000hrs	Pass 0% DE=0.52 Pass
Weather Resistance <ul style="list-style-type: none"> ▪ Exterior Exposure @ 45° ▪ Gloss Reduction ▪ Colour Change ▪ Chalk Resistance 	South Florida ASTM D523 ASTM 2244 ASTM 4214	10 years 5000hrs 5000hrs 5000hrs	Pass 6.2% DE=0.27 Pass
Chemical Resistance <ul style="list-style-type: none"> ▪ Mortar Test ▪ Gloss Reduction ▪ Colour Change 	ASTM C207 ASTM D523 ASTM 2244	24hrs 16hrs 16hrs	Pass 6.2% DE=0
Solvent Resistance - MEK	ASTM 2794	Double Rub	Pass
Acid Resistance – 10% H ₂ SO ₄	ASTM 1308	7 days	Pass
Alkali Resistance – 10% NaOH	ASTM 1308	7 days	Pass
Detergent Resistance – 3%	ASTM D2248	72hrs	Pass

6.1 V-grooving:

V-grooving ULTRABOND to fabricate cassette panels is a simple and easy process, very similar to v-grooving other common ACP materials. Traditionally ACP with a solid core and 0.5mm face skin is grooved to leave approximately 0.3mm of core material remaining with total material remaining of 0.8mm (0.5mm face skin + 0.3mm of core).

The recommended overall depth for v-grooving ULTRABOND is the same as other common ACP materials to leave between 0.7-0.8mm of total material remaining including the 0.5mm face skin and 0.2-0.3mm of the fire-resistant core.

It is important to leave a minimum of 0.2mm core material at the base of the groove (0.7mm total material) so that the 0.5mm face skin is not touched by the router bit to ensure its inherent mechanical strength and structural integrity is retained.

Like any other standard ACP, a 90-degree v-groove router bit should be used with a minimum 3.0mm flat at the base of the v-groove.

MACHINE	TOOLING	DEPTH	M/Min
CNC Router (Recommended)	90° with flat 3.0mm wide base	Min 0.8mm of material remaining	10-15
Wall Saw or Portable Saw	Same as above	Same as above	10-15

6.2 Cutting:

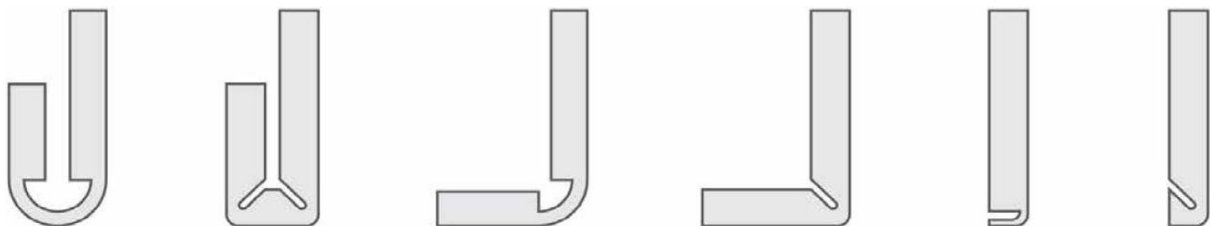
ULTRABOND can be cut with identical tooling to that used for similar ACP's. For CNC router machines, an up-spiral cutter is recommended to assist with swarf removal. There is no coolant required on the cutter or v-groove tooling when fabricating ULTRABOND panels.

6.3 Rolling:

ULTRABOND can be rolled to form a curved panel. Rolling machines with 2 sets of rollers are recommended for best results and rollers should be perfectly clean and free from swarf which may damage the panels. It is recommended to conduct testing to ensure satisfaction with the results before commencing production.

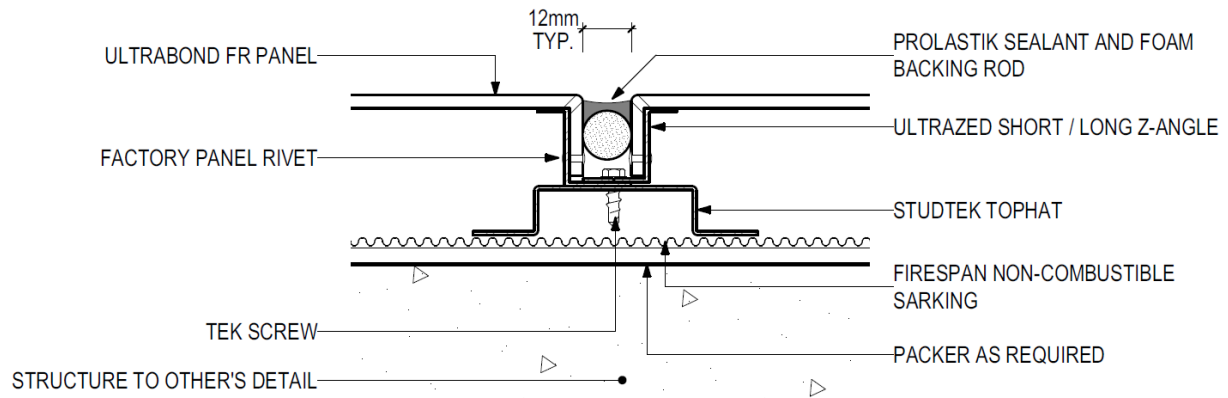
6.3 Edge Close-out Methods:

Acceptable edge close-out methods are as below;



7.1 Installation:

Mechanical cassette-fix installation is the recommended installation system for ULTRABOND cladding using the well-proven v-groove 'route & return' fabrication method with offset aluminium z-angles as per the below detail. It is also acceptable to install ULTRABOND in a glazing suite for curtain wall application. Tape-fix installation is not recommended.



ULTRABOND installation details are available in PDF and CAD on request. The ULTRABOND installation details are provided for conceptual purposes only. These are not the only methods that can be used to attach ULTRABOND, nor can they be used generically without consideration for each individual application. Good design engineering may preclude the choice of details used.

7.2 Acceptable System Components:

Sarking:

Shall be FIRESPAN deemed-to-satisfy non-combustible sarking tested by a NATA accredited laboratory to AS 1530.1. Install and tape in accordance with AS 4200.2 to all cladding areas.

Sub-framing System:

The sub-framing system to be attached to the main structure in a manner to ensure all applied loadings to the cladding is transferred back to the main structure. Size and spacing of top hat members shall be determined according to applied loads and deflection limitations. Top-hat centres shall be maximum 600mm or installed in a matrix layout to provide full perimeter support to each panel as required to adequately support the cladding system.

- STUDTEK Facade Framing, 08 9451 2344, sales@bluechipgroup.net.au.

STUDTEK Zinalume Framing is recommended and it is cold-formed according to AS/NZS:4600 from Zinalume G300 steel which is continuous hot-dipped aluminium/zinc alloy-coated structural steel as per AS:1397.

Aluminium Z-angle Profiles:

Shall be ULTRAZED extruded aluminium alloy AA 6063-T5 supplied by Blue Chip Group Pty Ltd. The long z-angle shall be powder-coated to avoid bimetallic corrosion with the top-hats.

Panel Joint Sealant:

Panel joints to be sealed with PROLASTIK matt silicone sealant supplied by Blue Chip Group Pty Ltd and installed over open cell foam backing rod to manufacturer's specifications.

7.3 General Installation Guidelines:

- All sheets should be installed in the same direction as marked on the protective film to prevent possible finish variation.
- As minor colour variation can occur between production lots, it is recommended to place total requirements for a project in one order to ensure colour consistency.
- Where aluminium materials come into contact with dissimilar metals, a proper insulator, protective coating or caulking tape should be applied to insulate between dissimilar materials in order to avoid bimetallic corrosion and/or electrolytic action.
- The cassette fixed panel joints should not be caulked before the protective film is removed.

7.4 Recommended Panel Sizes:

Panel sizes should be limited as required for any given application, considering the minimum & maximum temperatures the panel will be exposed to, the colour of the panel and the façade orientation to ensure the panels thermal movement will not exceed the systems capabilities and to ensure ongoing durability and waterproofing.

Special consideration should be given to the following;

- Overall panel sizes to ensure thermal movement will not exceed joint sealant capabilities
- Distance to joints either side of corner and parapet panels to avoid stress on the corner

8.1 Protective Film:

- Make sure no damage will occur to the panel prior to the removal of the protective film.
- Remove the protective film within 45 days of installation to avoid glue residue on panel surface due to weathering.
- Do not apply PVC tapes, polyurethane sealant or silicone sealant onto ULTRABOND protective film. The plasticiser contained in these materials can penetrate the protective film and cause a gloss change in the coating.
- Do not apply spray paint or permanent marker to the film as the colour may penetrate the film and affect the surface coating of the panel.

8.2 Storage & Handling:

- Considerable care should be taken in the handling of ULTRABOND as the panels are sensitive to impact particularly from small hard objects such as stones which can dent the aluminium cover sheet
- A minimum of two people should be used when moving and stacking large sheets to avoid surface damage. Sliding panels should be avoided unless they are back-to-back.
- Pallets of ULTRABOND should be stored horizontally in a cool and dry area where temperature is stable with adequate support to prevent sagging.
- Stacked pallets should be identically sized and not more than three (3) pallets high.

8.3 Cleaning & Maintenance:

- The cladding shall be cleaned and maintained in accordance with AAMA 609 & 610-09 as required to avoid any accumulation of surface contaminants and to maintain the desired performance and appearance.