



TECHNICAL MANUAL

ULTRACORE Non-combustible Aluminium Core 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 ULTRACORE. 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.

With offices in Sydney, Melbourne and Perth, 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
Head Office: 16 Ashby Close, Forrestfield WA 6058
Phone: 1300 945 123
Email: sales@bluechipgroup.net.au



1.4 Product Description:

ULTRACORE manufactured by BLUECHIP is a Deemed-to-Satisfy (DtS) non-combustible aluminium panel when tested to AS 1530.1 and AS 1530.3 as per the requirements of the NCC 2019, Clause C1.9(e)(vii). It has also been tested by Exova Warringtonfire to BS 8414 and AS 5113 full-scale testing to prove it does not contribute to the spread fire. Visually, ULTRACORE aluminium core panel looks the same as traditional aluminium composite panel but with zero combustible core content (0%) meaning it achieves the lowest risk rating, category D, from the Insurance Council of Australia.

Proven V-Groove Durability

Unlike SOLID aluminium panels, ULTRACORE can demonstrate 40 years of proven corner durability when using the common v-groove folding system. This is because the front skin is not impacted when v-grooving.

AS 1530.1 Non-Combustible

ULTRACORE is one of the few aluminium panels globally that is Deemed-to-Satisfy non-combustible when tested to AS 1530.1 and AS 1530.3 in accordance with the NCC 2019 Clause C1.9(e)(vii) requirements.

AS 5113 Fire Testing

ULTRACORE is Deemed-to-Satisfy non-combustible so does not require further testing however it has been tested to AS 5113 full-scale testing by Exova Warringtonfire to prove it does not contribute to the spread of fire.

Zero Polyethylene (0%)

Unlike most other aluminium panel products including FR, Plus, A2 and NC type panels, the ULTRACORE aluminium core panel contains ZERO percent flammable polyethylene (0%) and each lamina is 100% non-combustible.

Less Thermal Conductivity

ULTRACORE aluminium core panel has thermal conductivity of 2.54 W/mK compared to 205 W/mk for SOLID aluminium panel. This means 80 x less heat transfer into the building for greater fire safety and section J compliance.

Faster Fabrication Time

Compared to solid aluminium panel, ULTRACORE panel is much more cost-effective, faster and easier to fabricate on CNC machines using the well-proven z-angle cassette system with concealed mechanical fixings.

Oil-Canning Resistance

Oil-canning is the uneven distribution of tension in SOLID aluminium panels which results in a rippling effect on the facade. The superior mechanical properties of ULTRACORE guarantees against oil-canning.

Less Carbon Footprint

ULTRACORE aluminium core panel uses approximately 50% less aluminium per m² than solid aluminium panels for much less carbon footprint and it is 50% lighter for significant structural and labour savings.

1.5 More Information:

<https://www.bluechipgroup.net.au/facade-cladding-perth/non-combustible-cladding-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

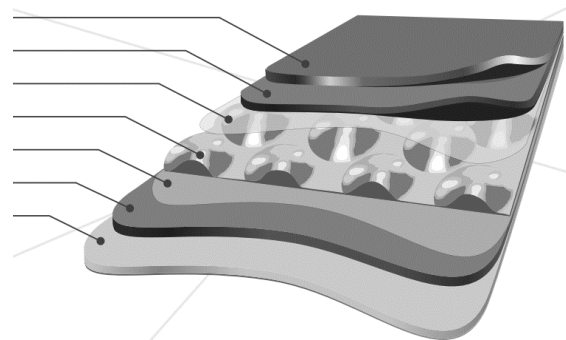
2.3 Product Warranty:

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. PVDF Coil Coating System
2. 0.7mm Aluminium Face Skin
3. <0.1mm Dry-film Adhesive
4. 2.6mm Profiled Aluminium Core
5. <0.1mm Dry-film Adhesive
6. 0.5mm Aluminium Rear Skin
7. Polyester Anti-corrosion Coating



3.3 Core Composition:

Each lamina of ULTRACORE including the 0.7mm face skin, the 2.6mm profiled core and the 0.5mm rear skin is made from 100% aluminium with zero percentage of combustible content.

Unlike FR, A2 and NC type cores, the ULTRACORE aluminium core does not rely on flammable polymers for its mechanical integrity so it can offer both superior fire safety as well as superior resistance to core delamination over time with much higher bond peel strength.



3.3 Technical Data – Physical Properties:

ITEM	TEST STANDARD	UNIT	RESULT
Thickness	Actual	mm	4.0
Panel Weight	Actual	Kg/m ²	4.2
Face Skin Thickness	Actual	mm	0.7
Rear Skin Thickness	Actual	mm	0.5
Adhesive Thickness per Layer	Actual	mm	<0.1
Adhesive Total Thickness	Actual	mm	<0.2
Bond Peel Strength	ASTM D1781-98	N/mm	>270
Tensile Strength (Skins)	ASTM E8	MPa	>160
Thermal Conductivity	ASTM C-518	W/mK	<3.0
Thermal Expansion	Actual	mm/m/°C	0.025
Alloy Grade / Temper	Actual	-	3003 H14
Standard Sheet Sizes			
▪ 2500 x 1500mm	Actual	m ²	3.75
▪ 3200 x 1500mm	Actual	m ²	4.80
▪ 4000 x 1500mm	Actual	m ²	6.00
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 Deemed-to Satisfy Non-combustible:

ULTRACORE is deemed-to-satisfy non-combustible as per the requirements of the NCC 2019, clause C1.9(e)(vii) for use on any building of types A, B & C construction, classes 2-9.

4.2 Technical Data – Fire Performance:

ITEM	TEST STANDARD	UNIT	RESULT
Non-combustible	AS 1530.1	CSIRO	Pass
Non-combustible (DTS)	NCC C1.9(e)(vii)	CSIRO	Pass
Ignitability Index	AS 1530.3	CSIRO	0
Spread of Flame Index	AS 1530.3	CSIRO	0
Heat Evolved Index	AS 1530.3	CSIRO	0
Smoke Developed Index	AS 1530.3	CSIRO	1
Full-scale Temperature Results*			
▪ 5m External (50mm)	AS 5113	<600°C	Pass
▪ 5m Panel Cavity	AS 5113	<250°C	Pass
▪ 5m Framing Cavity	AS 5113	<250°C	Pass
▪ 0.9m Unexposed	AS 5113	<180°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

*Although NOT required for compliance, ULTRACORE has been tested to BS 8414 and AS 5113 full-scale testing to prove it does not contribute to the spread fire in a real-world fire scenario.



5.1 Paint Systems:

ULTRACORE 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.

ULTRACORE 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% H2SO4	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 ULTRACORE to fabricate cassette panels is a simple and easy process, very similar to v-grooving traditional ACP such as ULTRABOND FR. 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 ULTRACORE is the same or slightly less than traditional ACP to leave between 0.8-0.9mm of total material remaining including the 0.7mm face skin and up to 0.2mm of adhesive and the profiled aluminium core. For best results route to 0.8mm depth removing all the aluminium core and only leaving the 0.7mm face skin and the 0.1mm adhesive layer at the base of the groove.

It is important to leave a minimum 0.1mm of adhesive / core material at the base of the groove (0.8mm total material) so that the 0.7mm face skin is not touched by the router bit to ensure its inherent mechanical strength and structural integrity is retained.

Like 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 a 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:

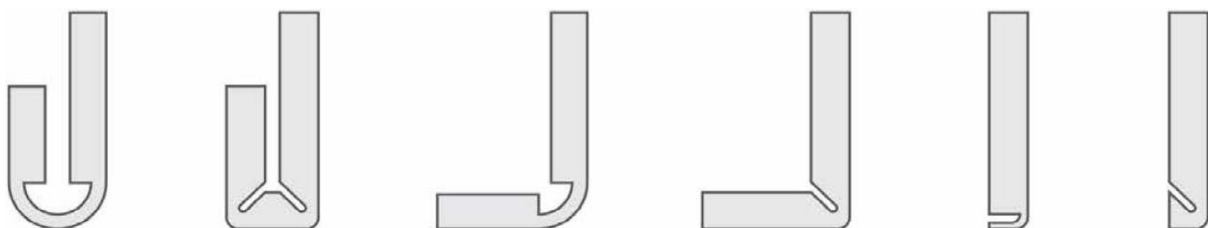
ULTRACORE can be cut with identical tooling to that used for ULTRABOND FR and similar ACP's. For CNC router machines, an up-spiral cutter is recommended to assist with swarf removal. There is no coolant required on the cutter or v-groove tooling when fabricating ULTRACORE panels.

6.3 Rolling:

ULTRACORE can be rolled to form a curved panel the same as traditional ACP's to a minimum radius of 2m. 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:

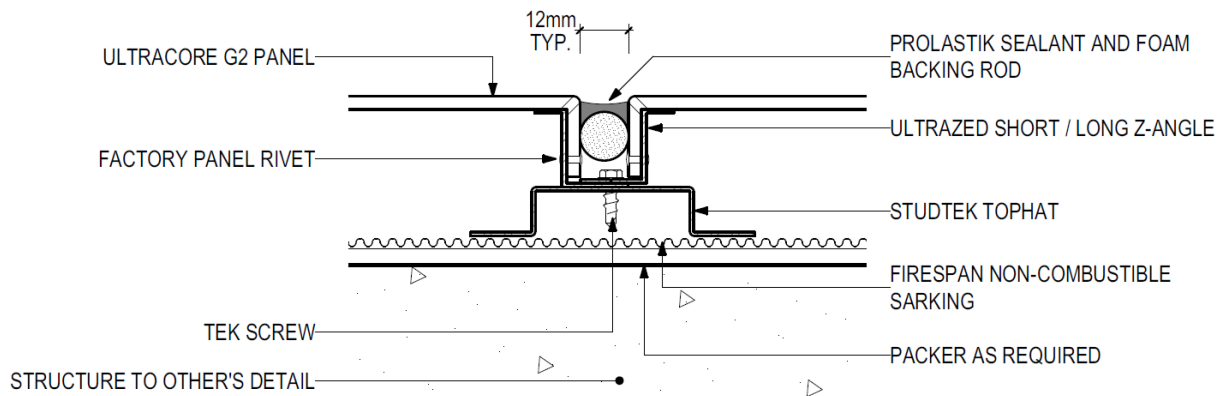
Acceptable edge close-out methods are as below;





7.1 Installation:

Mechanical cassette-fix installation is the recommended installation system for ULTRACORE 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 ULTRACORE in a glazing suite for curtain wall application. Tape-fix installation is not recommended.



ULTRACORE installation details are available in PDF and CAD on request. The ULTRACORE installation details are provided for conceptual purposes only. These are not the only methods that can be used to attach ULTRACORE, 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 (Delete if using SINIAT WD as below – recommended):

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.

Rigid Sheathing Board (Best practice in lieu of Sarking):

Shall be SINIAT WD 12.5mm deemed-to-satisfy non-combustible, vapour permeable material which assists in achieving a 60/60/60 FRL when installed as per manufacturer's directions.

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.

Acceptable Sub-framing manufacturers are:

- STUDTEK Facade Framing, 1300 945 123, sales@bluechipgroup.net.au.

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 closed 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 ULTRACORE 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 ULTRACORE 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 ULTRACORE 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.