



BLUECHIP

Facade Panels

ULTRACORE G2

Technical Manual

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# 1. ABOUT THIS MANUAL

This manual has been developed to effectively assist fabricators and contractors to work with ULTRACORE G2. Due to the uncontrollable conditions and methods of job scope, as well as the variable skills and judgment of users/installers and the quality of equipment, tools, etc., the suggestions and recommendations contained in this manual are provided without warranty.

The information and recommendations contained herein are believed to be correct at time of publishing 01/10/2016. BLUECHIP reserves the right to revise the contents of this manual without prior notice.

Canberra Airport, Canberra ACT



# 2. INTRODUCTION

## 2.1 PREFACE

Radical reappraisals of the form and function of buildings are leading to questions being asked of traditional cladding systems. The emergence of new materials and manufacturing technologies are challenging pre-conceived notions of the engineered facade. The growing popularity of composite panels in recent years is due to the increasing desire for panels that not only look clean and modern, but also offer rapid installation and provide reliable long-term performance.

ULTRACORE G2 Non-Combustible Aluminium Composite Panel by BLUECHIP addresses these changing requirements, enabling a modern and high quality envelope construction to be achieved, within the strictest timeframe and budget.

## 2.2 COMPANY AND BACKGROUND

Our focus is on the manufacture and supply of architectural building envelope products from the structure out. Our range includes cladding materials, sub-framing, insulation and fixings.

Based in Perth Western Australia, BLUECHIP has supplied more than 2,000,000m<sup>2</sup> of materials to Australian projects since we launched our ULTRABOND aluminium composite brand in 2007. With over 89 years' experience in external building envelopes, BLUECHIP is dedicated to the consistent delivery of innovative, superior quality facade solutions that meet the performance requirements and design vision of every project.

BLUECHIP carries one of the largest stock holds in Australia of prefinished architectural facade panel meaning we have the ability to ensure consistent and reliable supply to builders and contractors for timely completion of projects. For architects and designers, BLUECHIP's wide range of different facade materials and finishes give the opportunity to create inspiring landmark facades which provide superior outcomes in design, value and performance.

### **Our Mission**

We are an innovative and proactive architectural building envelope supply company consistently delivering architectural facade solutions with excellence in quality and customer service.

### **Our Vision**

We will lead the facade supply industry in our market through facilitating the design, manufacture and delivery of superior building envelope solutions from the structure out.

170 Railway Parade, West Leederville WA



## 2. INTRODUCTION CONTINUED

### 2.3 PRODUCT DESCRIPTION

Manufactured by BLUECHIP; ULTRACORE G2 is deemed non-combustible when tested to AS1530.1 as per the requirements set out in the BCA.

Visually, ULTRACORE G2 is the same as traditional composite panel; but what makes it different is the technology of the core, which is constructed from a 100% aluminium structure rather than combustible material.

It is the same to fabricate and install as traditional ACP, and utilises the PPG coating system; thus is available in the same extensive colour range.

The technology of the core also allows continual production; providing an exceptionally consistent and cost effective product. This high performance panel is ideal for all façade and soffit applications; providing the decisive solution to high demands and requirements.

The benefits of ULTRACORE G2 include its high mechanical properties and simple fabrication. The outstanding surface flatness of ULTRACORE is enhanced with a high quality PVDF coating system, which provides optimum resistance to weather and industrial pollutants in an unlimited range of colours, or a selection of natural finishes.

ULTRACORE G2 can be easily and accurately installed by a pre-made cassette system, requires very minimal maintenance and comes with a 10 year warranty.

### 2.4 ADVANTAGES OF ULTRACORE G2

- Deemed non-combustible as required by the BCA
- Cost effective, large stock holdings & short lead times
- 10 Year warranty
- Tested to AS1530.1 & AS1530.3
- Visually the same as traditional composite panel
- Imitations such as corten
- Core technology allows for continual production; resulting in an exceptionally consistent product
- Available in many finish options including solid & metallic, natural copper & zinc, stainless steel, special effects colours, stone, timber look & natural metal



# 3. QUALITY

## 3.1 MANUFACTURING QUALITY

A dedication to the total fulfillment of our client's and customer'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
- Create continuous improvements to our product through the application of the best quality practices.

## 3.2 ACCEPTANCE VARIATION

Width	± 2.0 mm
Length	± 4.0 mm
Thickness	± 2% for 3 mm & 4 mm; 3% for 6 mm
Bow Maximum	0.5% of the length and/or width
Squareness Maximum	5.0 mm
Surface Defects	The surface shall not have any irregularities such as dents, scratches and other imperfections in accordance with our quality assurance

## 3.3 WARRANTY

The standard warranty is 10 years, with longer warranties available on a project specific basis.

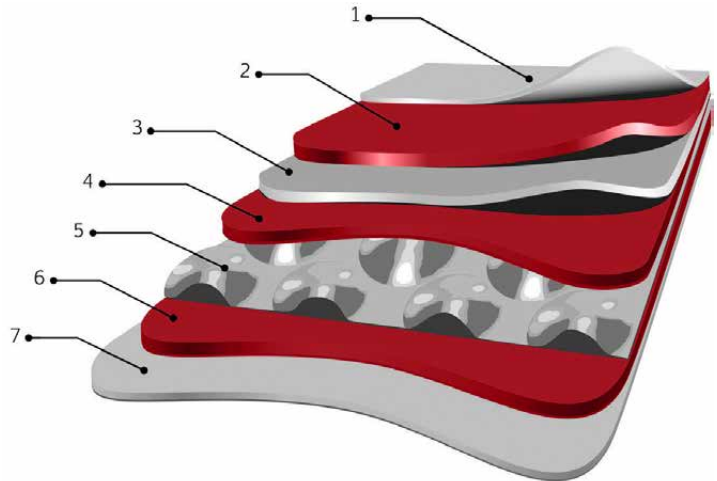


# 4. MATERIAL PROPERTIES

## 4.1 TYPICAL COMPOSITION

1. Peel-off Protective Film
2. PVDF Coating System
3. Primer Coating
4. 0.7mm Aluminium Skin
5. 3mm Profiled Aluminium Core
6. 0.5mm Aluminium Skin
7. Polyester Anti-corrosion Coating

The composite material is rigid, resistant to blows, breakage and pressure, and has high bending, buckling and breaking strengths.



## 4.2 SKIN AND CORE

Aluminium Skins - surface material both sides: 0.7mm faceskin, 0.5mm rear skin. Core Material - Aluminium

## 4.3 DIMENSIONS

WIDTH	LENGTH	THICKNESS
1220	3200	4mm
	4000	
1500	3200	
	4000	

Custom sizes are available, please speak to the BLUECHIP team

## 4.4 WEIGHT

THICKNESS	WEIGHT (kg/m <sup>2</sup> )
4mm	4.4

## 4. MATERIAL PROPERTIES CONTINUED

### 4.5 TECHNICAL DATA

CLASSIFICATION	TEST STANDARD	UNIT	ULTRACORE G2
Panel Weight		[kg/m <sup>2</sup> ]	4.4kg/m <sup>2</sup>
Thickness		[mm]	4
Thickness of Aluminium Face		[mm]	0.7
Width		[mm]	1220/1500
<b>ALUMINIUM SKIN</b>			
Tensile Strength			160MPa
Alloy/Temper Of Aluminium Layers			3003 H24
<b>SURFACE PROPERTIES (PVDF COATINGS)</b>			
Dry Film Thickness (Nominal)	ASTM D1400		0.20-0.30 mil primer 0.70-0.80 mil topcoat
Gloss	ASTM D523		Standard @ 60°: 25-35 Duranar LG @ 85°: <10
Pencil Hardness	ASTM D3363		F-2H
Flexibility	T-Bend, ASTM D4145		0-2 T-Bend; No pick-off
Adhesion	ASTM D3359 Reverse Impact 1/16' crosshatch		No adhesion loss
Reverse Impact	ASTM D2794		1.5 x Metal thickness (aluminium): No cracking or adhesion loss
Acid Resistance	ASTM D1308		10% Muriatic acid - 24 hrs: No effect
Acid Rain Test	Kesternich SO <sup>2</sup> , DIN 50018		15 Cycles min. No objectionable colour change
Alkali Resistance	ASTM D1308 10%, 25%, NaOH, 1 hr.		No effect
Salt Spray Resistance	ASTM B117 5% salt fog @ 95°F		Passes 4000 hrs. Less than 1/1' avg. creepage from scribe; None or few #8 blisters
Humidity Resistance	ASTM D714 ASTM D2247 100% relative humidity @ 95°F		Passes 4000 hrs. No #8 blisters
Exterior Exposure	10 yrs. @ 45°, South Florida ASTM D2244 ASTM D4214		Max. 5 fade Max. 8 chalk



# 5. FINISHES

## 5.1 STOVE LACQUERING

ULTRACORE G2 uses only the highly recognised PVDF KYNAR 500 or FEVE paints known for their high durability. These premium paints provide an optimum resistance to weather and industrial pollution. More than 40 years of South Florida Exposure Testing is continuing to confirm the superior chemical and physical properties of fluoro polymer coatings.

ULTRACORE G2 has unlimited colour, we are able to match any finish, from any colour range.

## 5.2 ANODISING

ULTRACORE G2 panels come in a range of Anodised finishes, offering both standard and customised colours and textures.

## 5.3 NATURAL FINISHES

BLUECHIP offers the following natural finished panels.

- ULTRACORE G2/ZN – Natural zinc composite panel
- ULTRACORE G2/CU – Natural copper composite panel
- ULTRACORE G2/SS – Stainless Steel composite panel



## 5. FINISHES CONTINUED

### 5.4 TECHNICAL DATA OF KYNAR 500 PVDF COATING

CLASSIFICATION	TEST STANDARD	RESULT	REMARKS
Substrate	ASTM D1005	Pass	Aluminium
Flexibility	ASTM D4145 ECCA T7 NCCA11-19	Pass	1~2T - No Cracking
DFT	ASTM D1400 ASTM D1005 NCCA11-13,14,15	Pass	
Colour Difference	ASTM 2244	$\Delta E < 5$	4000hrs
Gloss Meter	ASTM D523	Pass	
Gloss Retention	ASTM 2244	85%	4000hrs
Chalking Resistance	ASTM 2244	<8 units	4000hrs
Pencil Hardness	ASTM D3363	HB	
Dry Film Adhesion		Pass	38°C, 24hrs
Wet Adhesion		Pass	100°C, 24hrs
Hot Adhesion		Pass	
Reverse Impact Resistance	ASTM D2794	No Cracking	12.7mm x 0.5kg x 500mm
Bending/Gardner Impact	ASTM D3281	Pass	Normal
Solvent Resistance	ASTM 2794	Pass	MEK double rubs
Acid Resistance	ASTM 1308	Pass	7 days soaking in 10% H <sub>2</sub> SO <sub>4</sub>
Alkali Resistance	ASTM 1308	Pass	7 days soaking in 10% NaOH
Detergent Resistance	ASTM D2248	Pass	72 hrs soaling in 3% detergent
<b>SALT RESISTANCE</b>	<b>ASTM B117</b>	<b>Includes the following:</b>	
Gloss Retention	ASTM D523	0.8% change	5000hrs
Colour Retention	ASTM 2244	$\Delta E = 0.68$	5000hrs
Chalk Resistance	ASTM 4214	Rating: 10	Top rating - no chalk (5000hrs)
<b>HUMIDITY RESISTANCE</b>	<b>ASTM D714</b>	<b>Pass</b>	<b>2000hrs</b>
	<b>ASTM B117</b>	<b>Includes the following:</b>	
Gloss Retention	ASTM D523	No Visible Change	5000hrs
Colour Retention	ASTM 2244	$\Delta E = 0.52$	5000hrs
Chalk Resistance	ASTM 4214	Rating: 10	Top rating - no chalk (5000hrs)
<b>WEATHERING RESISTANCE</b>	<b>ASTM G53</b>	<b>Includes the following:</b>	
Gloss Retention	ASTM D523	6.2% Change	5000hrs
Colour Resistance	ASTM 2244	$\Delta E = 0.27$	5000hrs
Chalk Resistance	ASTM 4214	Rating: 10	Top rating - no chalk (5000hrs)
<b>CHEMICAL RESISTANCE</b>	<b>ASTM C207</b>	<b>Pass</b>	<b>Mortar, 24hrs</b>
	<b>ASTM D1308</b>	<b>Pass</b>	<b>10% Hcl, 15 min</b>
		<b>Pass</b>	<b>70% HN03 Vapours, 30 min</b>
		<b>Includes the following:</b>	
Gloss Retention	ASTM D523	6.2% Change	16hrs
Colour Resistance	ASTM 2244	No Change	16hrs
Chalk Resistance	ASTM 4214	Rating: 10	Top rating - no chalk (5000hrs)

# 6. FIRE RESISTANCE

In today's Architecture, it is the technical details, as well as the appearance that count; such as sustainability, thermal insulation, and fire protection.

ULTRACORE G2 is one of the few Aluminium Composite Panels (ACPs) globally, that is deemed non-combustible under the Building Code of Australia (BCA) and when tested to AS1530.1.

Visually, ULTRACORE G2 is the same as traditional composite panel; but what makes it different is the technology of the core, which is constructed from an aluminium structure rather than combustible material such as polyethylene and fire rated mineral. This makes ULTRACORE G2 the ideal product for all applications where fire resistance is required; be it high-rise buildings, Schools, Hospitals or other projects where fire safety is paramount.

As with all building products, the use of ULTRACORE G2 must be authorised by the appropriate regulatory body.

The Fire Resistance standards achieved with standard ULTRACORE G2 are as follows

ULTRACORE G2			
TEST STANDARD	RESULT		
AS1530.1	DEEMED NON-COMBUSTIBLE		
AS1530.3	Pass	Ignitability Index	0
	Pass	Heat Evolved	0
	Pass	Spread of Flame	0
	Pass	Smoke Developed	1



# 7. COMPONENTS

All components are available from BLUECHIP for simple order and supply.

COMPONENTS	CODE	DESCRIPTION
Double sided Adhesive Tape	TT707819	TESA 19mm 7078 ACXplus Panel Tape, 18m Roll
	TT707815	TESA 15mm 7078 ACXplus Panel Tape, 18m Roll
	TT704415	TESA 15mm 7044 ACXplus Stiffener Tape, 25m Roll
	TT704412	TESA 12mm 7044 ACXplus Stiffener Tape, 25m Roll
Joint Sealant	SKPROB60	SIKA Sikaflex PRO Black, 600ml Sausage
	SKPROW60	SIKA Sikaflex PRO White, 600ml Sausage
	SKPROO60	SIKA Sikaflex PRO Off White, 600ml Sausage
	SKPROC60	SIKA Sikaflex PRO Concrete Grey, 600ml Sausage
	SKPROD60	SIKA Sikaflex PRO Dark Grey, 600ml Sausage
Aluminium Z-Angles	UZL58	ULTRAZED 24mm Long Z-angle (Mill Finish), 5.8m Length
	UZS58	ULTRAZED 22mm Short Z-angle (Black Finish), 5.8m Length
Steel Top-hats	SG503560	STUDTEK 50 x 35mm Top-hat, 6.0m Length
	SG502436	STUDTEK 50 x 35mm Top-hat, 3.6m Length
	SG502460	STUDTEK 50 x 24mm Top-hat, 6.0m Length
	SG502436	STUDTEK 50 x 24mm Top-hat, 3.6m Length
	SG501560	STUDTEK 50 x 15mm Top-hat, 6.0m Length
	SG501536	STUDTEK 50 x 15mm Top-hat, 3.6m Length
Steel C-Channels	SG653060	STUDTEK 65 x 30mm C-channel, 6.0m Length
	SG653036	STUDTEK 65 x 30mm C-channel, 3.6m Length
Steel Angles	SGA757560	STUDTEK 75 x 75mm Angle, 6.0m Length
	SGA505036	STUDTEK 50 x 50mm Angle, 3.6m Length
	SGA353536	STUDTEK 35 x 35mm Angle, 3.6m Length
	SGA252536	STUDTEK 25 x 25mm Angle, 3.6m Length
Membranes	ISS13560	INSULSARK Heavy Duty Sarking, 1.35 x 60m Roll
	ISB13560	INSULSARK Heavy Duty Breather, 1.35 x 60m Roll
	IFX413522	INSULBLUE 4mm Foam Insulation, 1.35 x 22.25m
	IFX613522	INSULBLUE 6.5mm Foam Insulation, 1.35 x 22.25m
	IFX813522	INSULBLUE 8mm Foam Insulation, 1.35 x 22.25m
	ITR4850	INSULTAPE 48mm Reinforced Foil Tape, 50m Roll
	ITR9650	INSULTAPE 96mm Reinforced Foil Tape, 50m Roll

# 8. FABRICATION METHODS

## 8.1 MACHINING ULTRACORE G2

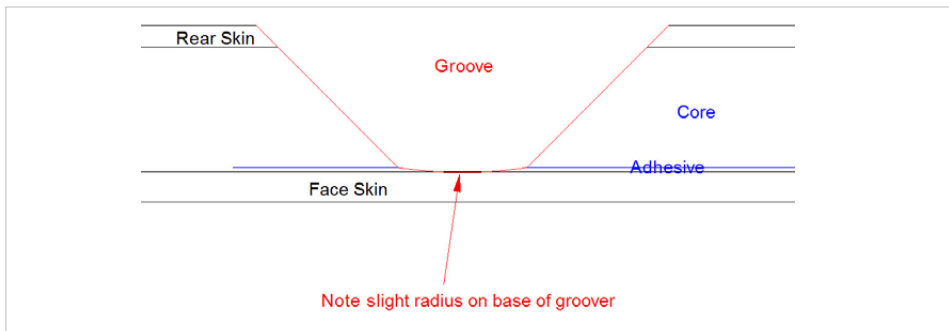
**GROOVING** - Grooving ULTRACORE G2 is a simple and easy process - very similar to grooving traditional ACP such as ULTRABOND FR. Traditionally solid core ACP is grooved leaving approximately 0.3mm of core material remaining. The special profiled core of ULTRACORE G2 is slightly more exacting on the groove depth but does not present any issues.

For a CNC Router, the perfect depth is just brushing the rear of the aluminium face skin. The tooling is the same as that for ACP - a 90 degree V-Groover with a 3mm flat. As depicted in the diagram below, for best results the flat should be adjusted to a slight curve. This is simply done with a linisher or bench grinder. Of course, this tool still works just as well for ACP.

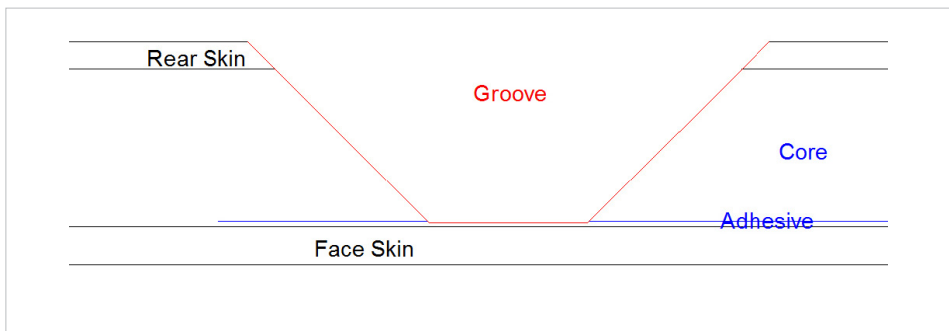
When using a Festool or Wallsaw, the grooving blade should remove all the aluminium of the core and be touching the adhesive layer on the rear of the face skin. With the Festool, the correct depth gauge roller is the Dibond4, available from BLUECHIP. This allows the blade to cut slightly deeper than it would with the usual Alucobond4 roller. It is important that the tooling be kept sharp as blunt tooling increases heat and pressure on the panel, which in turn can reduce groove quality.

The 0.7mm face skin used with ULTRACORE G2 is what enables the groove depth to penetrate the rear of the face skin, while still providing the required corner strength and gentle radius on the fold. If there are concerns the groove has gone too deep and cut into the face skin of the panel, a possible solution is to glue an 'L' angle down the rear of the fold; or in a cassette panel glue the zed angle to the rear of the panel.

### CNC GROOVE



### FESTOOL GROOVE



## 8. FABRICATION METHODS CONTINUED

Specific details on feeds and speeds:

	TOOLING	FEEDS/SPEEDS	COMMENTS
CNC ROUTER	Typical 90° ACP V-groover with 3mm flat. Available from most tooling suppliers.	RPM: 18000 Feed: 8-12m/min	Keep sharp. Recommended to curve the flat on the groover slightly.
FESTOOL	Standard Festool 90° grooving blade. Use Dibond 4 depth gauge roller.	Speed: 10-15m/min	Groove on a flat even surface to ensure depth accuracy.

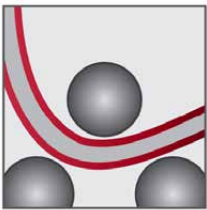


### 8.2 CUTTING

ULTRACORE G2 can be cut with identical tooling to that used for ULTRABOND FR and similar ACP's. For the CNC an upspiral cutter is recommended to assist with swarf removal. There is no coolant required on the cutter or groover.

Specific details below:

	TOOLING	FEEDS/SPEEDS	COMMENTS
CNC ROUTER	6.35mm Upspiral cutter. 1 or 2 flute.	RPM: 18000 Speed: 6-10m/min	Clean panel edges if not all swarf is removed
FESTOOL	Use Festool special saw blade for aluminium.	10-15m/min	



### 8.3 ROLLING/CURVING

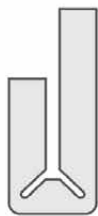
ULTRACORE G2 can be curved by means of a roll bending machine. It is recommended to conduct testing prior to actual production.

# 9. EDGE CLOSE-OUT DETAILS

ULTRACORE G2 panel edges can be closed out as per below details:



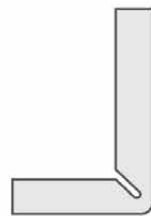
A



B



C



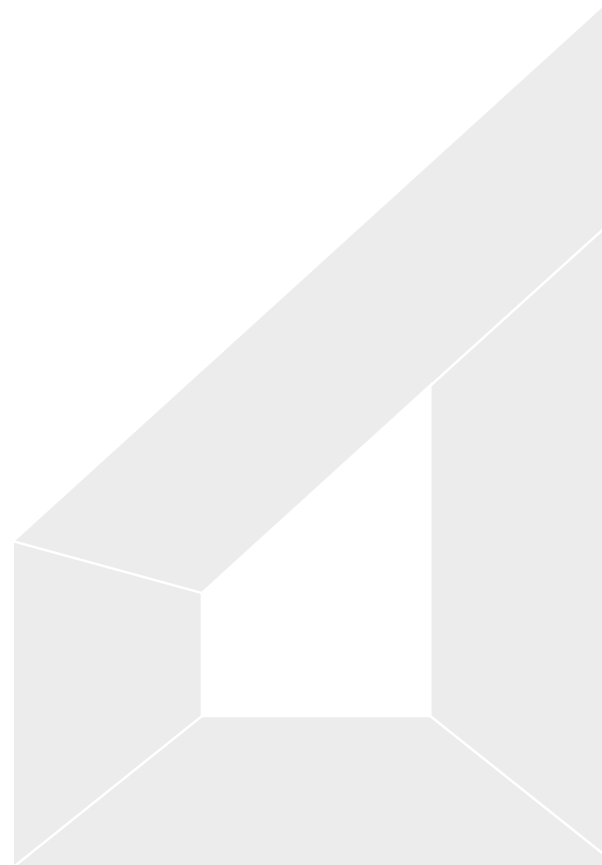
D



E

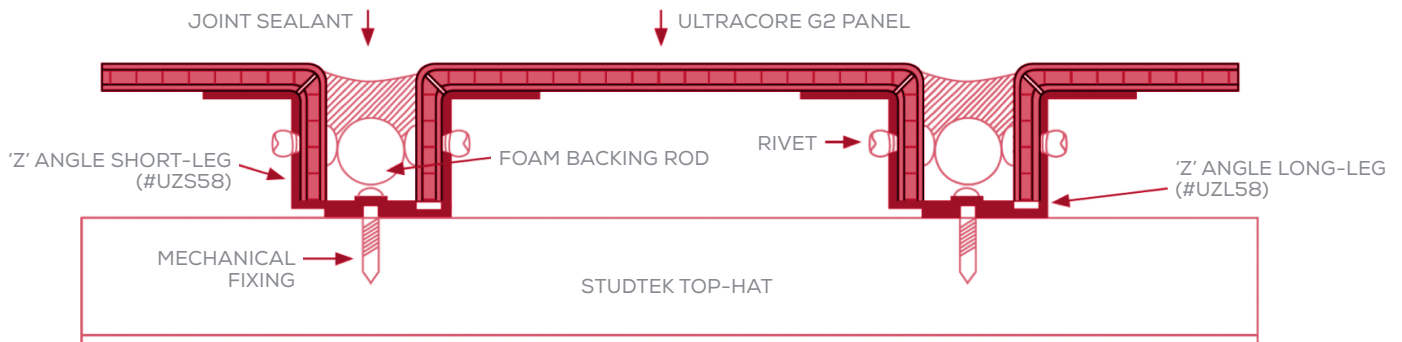


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# 10. INSTALLATION

## CASSETTE FIX

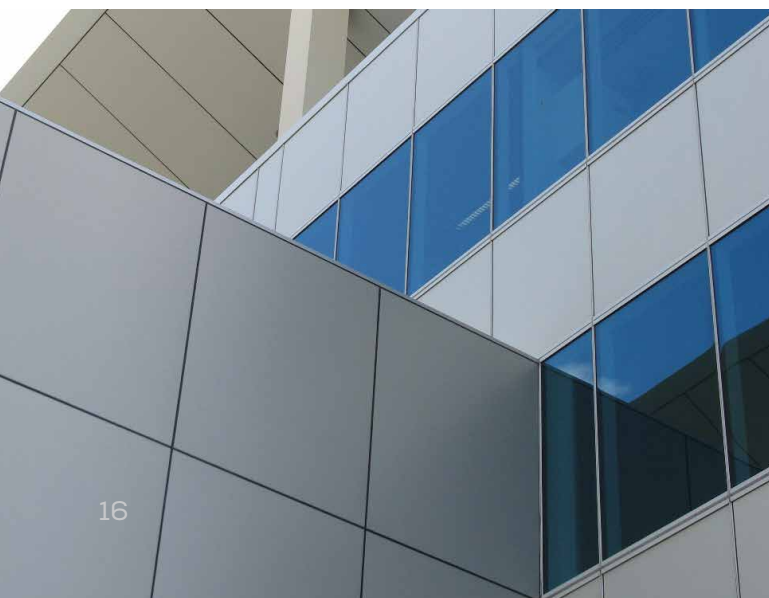


ULTRACORE G2 Installation details are available in PDF and CAD on request.

The ULTRACORE G2 installation details are provided for conceptual purposes only. These are not the only methods that can be used to attach ULTRACORE G2, nor can they be used generically without consideration for each individual application. Good design engineering may preclude the choice of details used.

## 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 requirement for a project in one order to ensure colour consistency
- Where aluminium materials come in contact with dissimilar metals, a proper insulator or caulking tape should be applied to insulate between dissimilar materials in order to avoid corrosive and electrolytic action
- The cassette fixed panel joints should not be caulked before strippable film is removed.





# 11. MISCELLANEOUS

## 11.1 PROTECTIVE FILM

- Make sure no damage will occur to the panel following removal of protective film
- Remove protective film within 3 months of installation to avoid glue residuals on panel surface due to weathering
- Do not apply PVC tapes, polyurethane sealant or Silicone sealant onto ULTRACORE G2 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 panel.

## 11.2 HANDLING AND STORAGE

- Considerable care should be taken in the handling of ULTRACORE G2 as the panels are sensitive to impact, particularly shocks from small, hard objects, which can dent the aluminium cover sheet
- A minimum of two people should be used when sliding and stacking large sheets to avoid scratching and surface damage
- Pallets of ULTRACORE G2 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.





BLUECHIPGROUP

## Architectural Building Envelopes

Facade Panels

Rightwood Cladding

Rightwood Decking

CFC Cladding

Fixing Systems

Insulation Products

62 Division Street, Welshpool WA 6106

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