

TECHNICAL INFORMATION



vitrabond

ALUMINIUM COMPOSITE PANEL / SUPPLIED BY FAIRVIEW



FAIRVIEW

DEFINING ARCHITECTURE SINCE 1963

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Canberra Airport, Canberra ACT



1. ABOUT THIS MANUAL

This manual has been developed to effectively assist fabricators and contractors to work with VITRABOND.

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 05/05/2015.

FAIRVIEW reserves the right to revise the contents of this manual without prior notice.

2. INTRODUCTION



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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.

Vitrabond Aluminium Composite Panel (ACP) by Fairview 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

Fairview specialises in the design, manufacture and distribution of a suite of quality façade solutions throughout Australia, North America and the United Kingdom. With almost 30 years' experience in the façade industry, we are dedicated to consistently facilitating the successful delivery of innovative facades that meet the requirements and vision of each project.

With one of the largest stock holds in Australia, we have the ability to ensure a consistent and timely supply to our dedicated installer network, in addition to this our flexible and innovative approach allows us to work closely with our clients on each project to deliver the best possible outcome. Fairview continues to develop our range of façade solutions and maintain a high level of service and support to the construction industry.

OUR MISSION

An innovative and proactive organisation, consistently delivering industry leading façade solutions; renowned for excellence of product and superior customer service.

OUR VISION

To lead the industry through facilitating the successful delivery of innovative façade solutions, which stimulate the creativity of building design.



2.3 PRODUCT DESCRIPTION - VITRABOND

Vitrabond is composed of two aluminium cover sheets sandwiched with a special homogeneous core material. It is a simple concept, resulting in outstanding surface flatness and high workability, with an excellent strength-to-weight ratio.

Two different core materials are available to suit a variety of applications: a polyethylene (PE) core, or Fire Retardant (FR) mineral compound core material.

Vitrabond is well suited for both exterior and interior architectural applications, as well as for industrial and specialty product designs. Applications include exterior cladding, signage, corporate ID, column covers, interior partitions, canopies, equipment enclosures and kiosks. The creative possibilities of Vitrabond really have no limits.

The versatility, combined with the availability of different panel fixing and jointing methods for vertical and horizontal joints, angles and curves, result in a smooth building envelope with no reduction in surface integrity.

Vitrabond ACP offers a unique combination of features and benefits that no other product can match.

2.4 ADVANTAGES OF VITRABOND

Throughout its history, Vitrabond has been proven to have excellent characteristics in many applications, such as exterior wall cladding, building envelopes, facades, louvers and feature walls. Based upon careful analysis, the key advantages of Vitrabond are listed below:

- Industry leading stock levels and lead times
- Cost effective
- Low maintenance
- Robust durability & strength
- Lightweight
- Over 60 standard colours
- Unlimited colour range available
- Optional FR core, complying with test standards worldwide
- Available in Natural Zinc, Stainless Steel, Natural Aluminium and Natural Copper

3. QUALITY



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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 ACCEPTABLE VARIATION

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

3.3 MANUFACTURING QUALITY

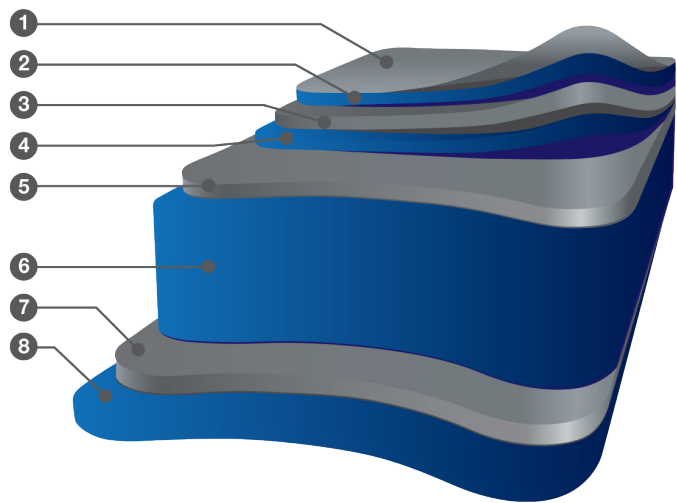
The ACP coating warranty is issued on a project specific basis, and is available up to 20 years. Contact Fairview for warranty details.



4. MATERIAL PROPERTIES

4.1 TYPICAL COMPOSITION

1. Peel-off Protective Film
2. Clear Coating
3. PVDF Coloured Coating
4. Primer Coating
5. 0.5mm Aluminium Skin
6. 3mm Polyethylene/FR Core
7. 0.5mm Aluminium Skin
8. Polyester Anti-corrosion Coating



4.2 ALUMINIUM SKINS

Surface material both sides: 0.5mm Aluminium sheets of a minimum 3000 series grade.

4.3 CORE MATERIAL

The standard PE core material is a mixture of polyethylene (PE), resin and hardener. The fire Retardant (FR) core is a mineral filled core, the key component being the compound Aluminium Hydroxide.

4.4 DIMENSIONS

- Available thickness: Standard 3mm, 4mm, 6mm. Custom thickness available.
- Panel width: Standard 1250mm, 1570mm. Custom 900-1575mm
- Panel Length: Standard 2500mm, 3200mm, 4000mm. Custom max 6500mm

4.5 WEIGHT

Surface material both sides: 0.5mm Aluminium sheets of a minimum 3000 series grade.

4. MATERIAL PROPERTIES CONTINUED



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4.6 WEIGHT

THICKNESS	WEIGHT (kg/m ²)	
	PE CORE	FR COR E
3mm	4.6	5.8
4mm	5.6	7.3
6mm	7.3	10.3

4.7 TECHNICAL DATA

Classification	Test Standard	Unit	4mm VITRABOND	
			PE Core	FR Core
Panel Weight		Kg/m ²	5.6	7.3
Core Density	ASTM C271	Kg/m ³	914.3	
Limit of Application		°C	-50 - +80	
Tensile Strength	ASTM E8	Kg/m ²	5.23	5.15
Yield Strength	ASTM E8	Kg/m ²	11.4	12.7
Elongation	ASTM E8	%	7.6	7.1
Flexural Stiffness (250mm span)	ASTM C393	Kg/m ²	1.8x10 ⁹	6.7x10 ⁸
Flexural Elasticity	ASTM C393	Kg/m ²	3222	3666
Deflection Temperature: At 66 PSI:	ASTM D648	°C	115	116
	ASTM D648	°C	>210	
THERMAL				
Thermal Expansion	ASTM D696	x10 ⁻⁶ /°C	25	24
Thermal Conductivity	ASTM D976	Kcal/mhr°C	0.387	0.39
BOND INTEGRITY				
Vertical Pull	ASTM C297	N/mm ²	9.13	5.9
Drum Peel	ASTM D1781	mmN/mm	372.32	368.7
Flat Shear	ASTM D1002	N/mm ²	7.69	6.84
SOUND				
Sound Isolation Rate	ISO140/3	500Hz		RW-26
		1000Hz		RW-29
Sound Reduction STC	ASTM E90	4.5-4KHz	dB	25
ALUMINIUM SKIN				
Tensile Strength		N/mm ²	Rm140	
0.2% Proof Stress		N/mm ²	Rp0.2100	
Elongation (50mm)		%	A501	



Plantbank, Mount Annan NSW

5. FINISHES

5.1 STOVE LACQUERING

Vitrabond only uses the highly recognised PVDF KYNAR 500, FEVE or VITREFLON V700 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.

Vitrabond has unlimited colour options, we are able to match any colour, from any other colour range. For a full list of standard Vitrabond colours, refer to the latest Vitrabond Colour Chart.

5.2 ANODISING

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

5.3 NATURAL FINISHES

Fairview offers the following natural finished panels:

- Vitrabond/ZN - Natural zinc composite panel
- Vitrabond/CU - Natural copper composite panel
- Vitrabond/SS - Stainless steel composite panel
- Natural Aluminium Vitrabond - uncoloured aluminium finishes

5.4 OTHER COATING FINISHES

The Vitrabond range also offers the following finishes:

- REPEL - A self-cleaning surface coating
- STATIC DISSIPATIVE (very low outgassing) Surface Coating - Designed for IT industries
- ANTI-BACTERIA Coating - to meet food handling and storage requirements
- SCREEN PRINTING for personalised design and imagery

For an ultra-durable vitreous enamel coated panel, please refer to 'Vitranamel', another Fairview product.

5. FINISHES CONTINUED



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5.5 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 Wet Adhesion Hot Adhesion		Pass Pass Pass	38°C, 24hrs 100°C, 24hrs
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 ₂ SO ₄
Alkali Resistance	ASTM 1308	Pass	7 days soaking in 10% NaOH
Detergent Resistance	ASTM D2248	Pass	72 hrs. soaking in 3% detergent
SALT RESISTANCE	ASTM B117	Includes the following:	
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)
HUMIDITY RESISTANCE	ASTM D714	Pass	2000hrs
	ASTM B117	Includes the following:	
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)
WEATHERING RESISTANCE	ASTM G53	Includes the following:	
Gloss Retention	ASTM D523	6.2% Change	5000hrs
Colour Retention	ASTM 2244	$\Delta E = 0.27$	5000hrs
Chalk Resistance	ASTM 4214	Rating: 10	Top rating – no chalk (5000hrs)
CHEMICAL RESISTANCE	ASTM C207	Pass	Mortar, 24hrs
	ASTM D1308	Pass	10% HCl, 15 min
		Pass	70% HN03 Vapours, 30 min
		Includes the following:	
Gloss Retention	ASTM D523	6.2% Change	16hrs
Colour Retention	ASTM 2244	No Change	16hrs
Chalk Resistance	ASTM 4214	Rating: 10	Top rating – no chalk (5000hrs)



6. FIRE RESISTANCE

The Fire Resistance standards achieved with standard Vitrabond are as follows:

PE CORE			
AS 1530.3	Pass	Ignitability Index	0
		Heat Evolved	0
		Spread of Flame	0
		Smoke Developed	0-1
BS BBA 4901	Pass		
BS 476.6	Pass	Index of overall performance	0.0
BS 476.7 class 1	Pass	Spread of Flame	0
ASTM E 84	Class 2 or B	Flame Spread Index	45
		Smoke Development	250
A/NZS 3837 group 4	Pass		
FR CORE			
NOTE: FR Core attains all the standards of PE core, as well as the below			
ASTM E 84	Class 1 or A	Flame Spread Index	10
		Smoke Development	20
ISO 9705 group 2	Pass		
NFPA 285	Pass		
A/NZS 3837 group 3	Pass		
Specification C1.10 of BCA 2010	Can be used as an attachment to the external walls in compliance with the specification. This is on the basis that the product is not used near or above an exit.		

For a product appropriate for use where non-combustible material is required, see Fairview's Vitracore Aluminium Honeycomb panel.

7. WINDLOADING



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The deflection of Vitrabond panel under load is demonstrated by the following charts. The charts are developed to show the amount of spacing between supports running lengthwise to the panel in comparison to the panel deflection. Deflections in excess of 51mm (2") are not allowed as this may stress the aluminium skin beyond tolerance limits.

Vitrabond panels can be stiffened by various means to resist wind loads and reduce panel deflection. All stiffeners should be a maximum of 600mm apart.

WINDLOAD DATA CHARTS

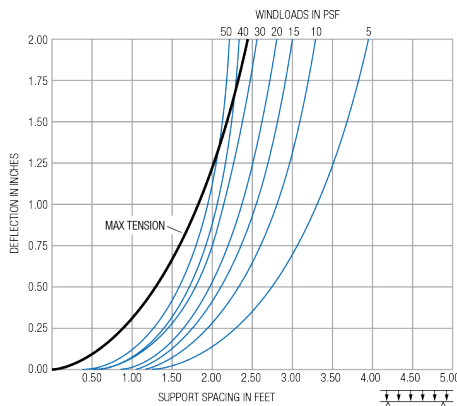


CHART 1 – WINDLOAD CHART: 3 MM, SINGLE SPAN

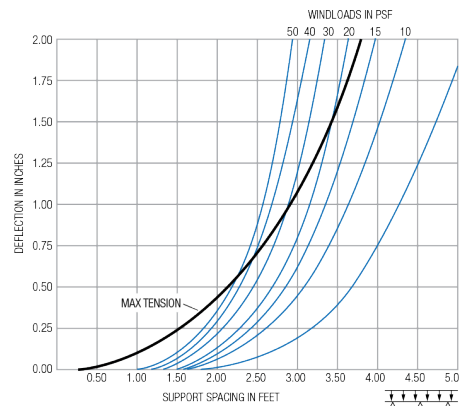


CHART 2 – WINDLOAD CHART: 3 MM, TWIN SPAN SIMPLY SUPPORTED

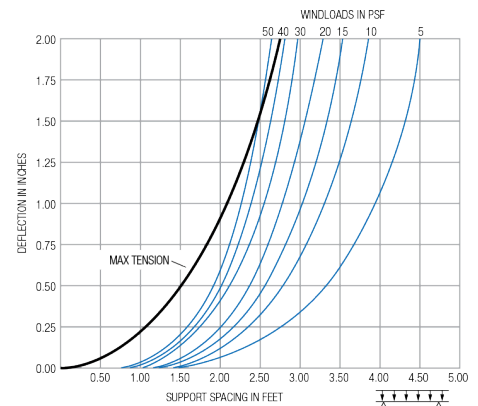


CHART 3 – WINDLOAD CHART: 4 MM, SINGLE SPAN

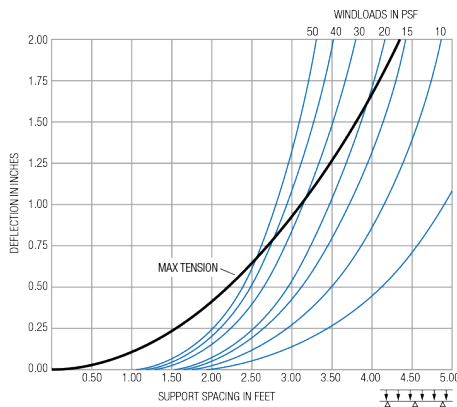


CHART 4 – WINDLOAD CHART: 4 MM, TWIN SPAN SIMPLY SUPPORTED

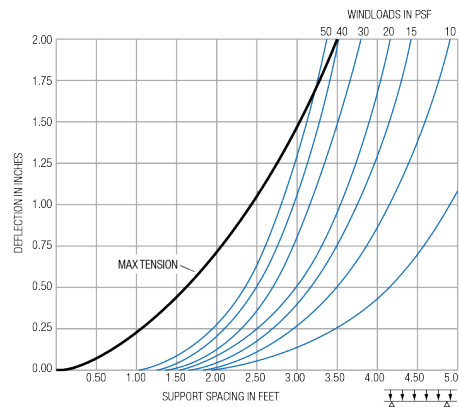


CHART 5 – WINDLOAD CHART: 6 MM, SINGLE SPAN

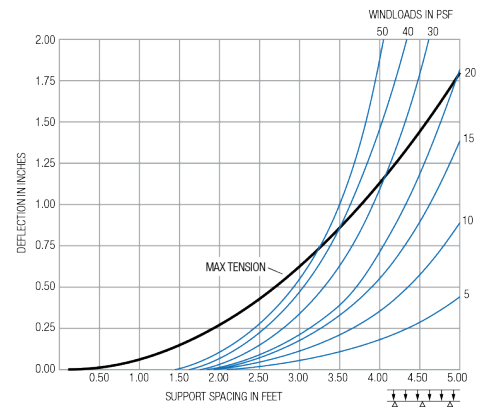


CHART 6 – WINDLOAD CHART: 6 MM, TWIN SPAN SIMPLY SUPPORTED



Metron Stadium, Carrara QLD

8. THERMAL PERFORMANCE

8.1 THERMAL INSULATING PROPERTIES

Thermal Resistance (PE core)		
From -50oC to +80oC		
Panel Thickness (mm)	Thermal Resistance 1A m2.K/W	Heat transmission Coefficient W/(m2.K)
3	0.0069	5.65
4	0.0103	5.54
6	0.0172	5.34

8.2 AVERAGE EXPANSION

The expansion and contraction of Vitrabond is controlled by the Aluminium cover sheets.

Material	Expansion coefficient (x10 -6/°C)	Elongation per 1000mm ΔT=50°C
VITRABOND	23.8	1.2
ALUMINIUM	23.8	1.2
ZINC	26.7	1.3
STEEL	12.2	0.6
CONCRETE	12	0.6

9. COMPONENTS



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All components are available from Fairview in the VITRAFIX installation accessories range for simple order and supply.

COMPONENTS	INSTALLATION TYPE		VITRAFIX CODE
	CASSETTE FIX	TAPE FIX	
3M™ VBH™ 4991F/4957F Tape		✓	3M4991F / 3M4957
3M™ VBH™ 4941F Tape	✓	✓	3M4941
HBF100 Silicone (or equivalent)	✓	✓	HBF100
Aluminium Z-Angles	✓		AZ4025 (high) AZ2310 (low)
Steel Tophats	✓	✓	T1550/15 (15mm) T2050/24 (24mm) T2050/35 (35mm)
Aluminium Stiffener	✓		ASR2819
Aluminium Angle	✓		AAL3203
Screws	✓	✓	SHQ208
Sarking	✓	✓	M1000



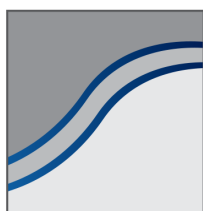
10. FABRICATION METHODS



10.1 CUTTING

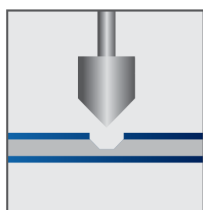
Vitrabond panel can be cut with a wall-saw, circular saw, bandsaw or jigsaw. The requirements for a circular saw are as follows:

The cutting tool material to be carbide tipped, thickness 2 - 4mm.	
Tooth geometry:	Trapeze/flat.
Tooth pitch:	10 - 12mm.
Rake Angle:	10° (positive)
Clearance Angle:	15°.
Max cutting speed:	500m/min.
Max feed speed:	30m/min.



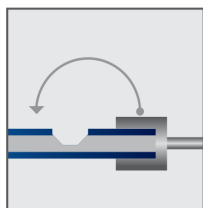
10.2 CONTOUR CUTTING

Vitrabond panel can be contour cut with water jets, CNC machines, copy routers and jigsaws.



10.3 ROUTING/FOLDING

Vitrabond panel can be cold shaped, enabling it to form various shapes and sizes. A rectangular or V-shaped groove can be routed on the back of the panel, following potential fold lines. A thin layer should remain at the base of the groove. The panel can then be hand folded along this groove, creating a precise and even fold. The outer radius of the fold can be determined by the shape and width of the routed groove. There must be between 0.3mm and 0.5mm of core material left at the base of the routed groove. Too much material can cause delamination at the corner and result in a larger radius fold than desired.

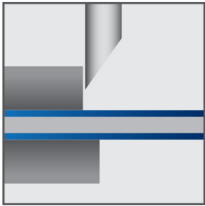


10. FABRICATION METHODS CONTINUED



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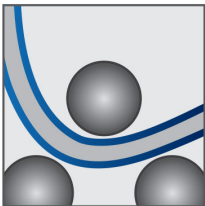
10.4 SHEARING

Shearing can be done with a guillotine. Ensure the blanking tools are padded. Shearing causes a slight roll down along the cut edge of the panel cover sheet.



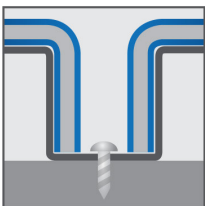
10.5 PUNCHING

The punching of flat formed parts from Vitrabond is performed in the same way as a solid aluminium sheeting, using sharp tools and dies with minimal cutting clearance. Varying shapes may easily be punched with normal aluminium punching machinery. As with shearing, a slight roll down may occur.



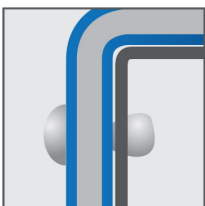
10.6 ROLL BENDING

Vitrabond panel can be bent with a roll-bending machine. Use polished rollers free of imperfections only.



10.7 SCREWING

Vitrabond can be screwed with conventional stainless steel or galvanised screws for wood ad metal. For outdoor use allow for thermal expansion.



10.8 RIVETING

Riveting is possible with the usual equipment and solid rivets or blind rivets. For outdoor use allow for thermal expansion.



Solis Apartments, Liverpool NSW

10. FABRICATION METHODS CONTINUED



10.9 DRILLING

Vitrabond panel can be drilled with centre point twist drills normally used for aluminium and plastics or machines common for metals. Drill material: High-Speed Steel (HSS).



10.10 BENDING

Bending is possible with a folding table or brake press. The inside bending radius is roughly 10 times the Vitrabond panel thickness. Use protective foils. There is more spring-back effect than with solid aluminium sheet. For serial production, tests should be made on sample panels.

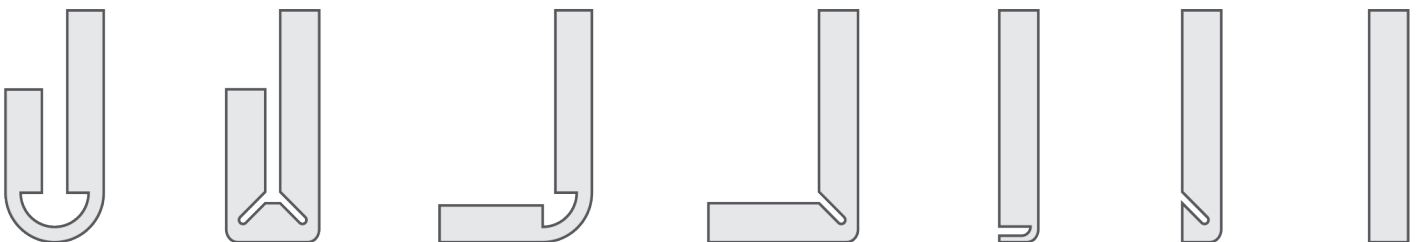


10.11 GLUING

Usual metal adhesives or double sided VHB tape should be used. There is low adhesion to the plastic core.

11. EDGE CLOSE-OUT & TREATMENT DETAILS

Vitrabond panel edges can be closed out as per below details



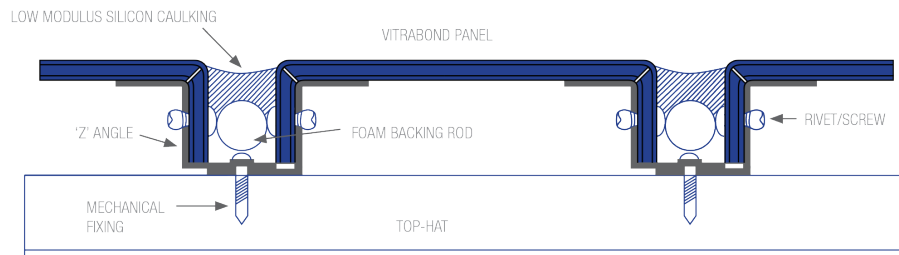
12. INSTALLATION



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CASSETTE FIX



3M™ TAPE FIX



It is also possible to Screw or Rivet Fix the VITRABOND.

It is also possible to Screw or Rivet Fix the Vitrabond.

See the Vitrabond Installation manual for details

The Vitrabond installation details are provided for conceptual purposes only. These are not the only methods that can be used to attach Vitrabond, 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
- For Cassette Fix, the bend-in portions between panel joints should not be caulked before strippable film is removed.



St John of God Hospital, Geelong VIC

13. MISCELLANEOUS

13.1 PROTECTIVE FILM

- Make sure there is no risk of any kind of damage to the material that may take place on the job site prior to removal of the film
- Remove protective film immediately after installation to avoid glue residuals on panel surface due to V radiation
- Do not stick, put or apply PVC tapes, polyurethane sealant and modified Silicone sealant onto Vitrabond protective film. The plasticizer contained in these materials can penetrate the protective film and cause a gloss change in the coating.

13.2 HANDLING AND STORAGE

- Considerable care should be taken in the handling of Vitrabond
- Vitrabond 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 large sheets to avoid scratching
- To prevent surface damage when stacking Vitrabond, there should be nothing between the panels
- Vitrabond should be stored in a cool and dry area where temperature is relatively stable
- Pallets of Vitrabond should be stored horizontally with adequate support to prevent sagging
- Stacked pallets should be identically sized and not more than six (6) pallets high.

13.3 RECYCLING

Al Vitrabond ACP is 100% recyclable.



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FAIRVIEW PRODUCT RANGE



vitrabond

ALUMINIUM COMPOSITE PANEL / MANUFACTURED BY FAIRVIEW



ceramapanel

COMPRESSED FIBRE CEMENT FACADE / MANUFACTURED BY FAIRVIEW



vitracore

ALUMINIUM HONEYCOMB CORE / MANUFACTURED BY FAIRVIEW



vitranamel

VITREOUS ENAMEL PANEL / MANUFACTURED BY FAIRVIEW



vitrafix

VITRABOND FIXING ACCESSORIES / MANUFACTURED BY FAIRVIEW

FUNDERMAX
for people
who create

Trimo

Qbiss.One

ArGeTon
TERRACOTTA FACADE TILE

EQUITONE
Fibre cement facade materials



FAIRVIEW

DEFINING ARCHITECTURE SINCE 1963

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