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**TECHNICAL INFORMATION**

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AS5113 COMPLIANT CLADDING SYSTEM / MANUFACTURED BY FAIRVIEW





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## DOCUMENT TRACKING

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VERSION #	DATE	CHANGES
1.0	03/08/20	Initial Issue

# 1. ABOUT THIS GUIDE

This guide has been developed to provide general guidance to consultants and contractors around Fairview's steel composite panel system, Vitrashield.

This does not replace the roles of relevant engineers and consultants in designing a project. It is the responsibility of these professionals to ensure that the details of this guide are appropriate for the intended application.

The information and recommendations contained herein are believed to be correct at the time of publishing, March 2020

Fairview reserves the right to revise the contents of this manual.

## 2. INTRODUCTION

### 2.1 ABOUT VITRASHIELD

Vitrashield is a series of AS5113 classified wall systems offering industry leading fire performance combined with extreme corrosion resistance, excellence in long-term weathering, high impact resistance and simplicity of installation.

Vitrashield is the first cassette cladding system in Australia to achieve an EW classification through full-scale fire testing to AS5113 and is continuing to achieve further passes on a range of systems.

When combined with the system, the Vitrashield panel can shield combustible elements within the wall build-up whilst still achieving a complete pass to AS 5113. This ability to provide high overall wall build-up flexibility, along with maintaining the same overall look as traditional aluminium panels, is especially suited to rectification works where combustible elements may already be present.

The Vitrashield external cladding system is a complete wall system as required by the AS5113 test, from internal plasterboard to the external cladding. The systems provide an essential basis for designing a safe and compliant external wall.

While Fairview offers a selection of systems that have already achieved EW classification to suit a variety of wall requirements, we are also able to assist with testing, engineering and assessments to achieve the safest and simplest compliant solution on an individual project basis.

The Vitrashield panel is easily and accurately installed by using a pre-fabricated panel cassette over a top hat sub-structure with hidden mechanical fixings.

Vitrashield® is a registered trademark and has a patent pending.

## 2.2 KEY FEATURES

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**PRODUCT DNA** Range of AS 5113 Compliant systems

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**FINISH** Vitrashield uses only the highly recognised Kynar 500® PVDF or FEVE paints known for their excellent durability, providing the optimum resistance to weather and industrial pollution.

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**FIXING SYSTEM** A cassette style concealed fixing system which is the same to fabricate and install as traditional ACPs.

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**APPLICATION** Anywhere a CV3 method to compliance is required.

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**WARRANTY** 15-year warranty, subject to standard terms and conditions.

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# 3. FINISHES

## 3.1 SOLID COLOUR RANGE



## 3.2 METALLIC COLOUR RANGE



## 4. ABOUT AS5113

This testing standard has been introduced into the building code as of BCA 2016 amendment one (March 2018). The most notable difference when it comes to testing for external wall products is this test requires an entire wall build up to be tested.

Based on the framework around the British BS 8414 test, the testing rig remains the same, at 8 meters high and 4 meters wide (including the wing wall).

The test runs for 1 hour in total, 30 minutes with a 3MW fire in the base of the rig and 30 mins of post fire observation. There are several criteria that need to be met, including temperatures and certain heights and depths of the wall along with flame spread and debris criteria.

## 5. SYSTEM OVERVIEW

Vitrashield is a series of external wall cladding systems, tested and assessed on a complete wall build-up.

### 5.1 CUSTOM SYSTEM

A key focus of Vitrashield is support and assistance with testing, engineering and assessments to ensure every project is specific, safe and compliant. This technical manual contains some tested and compliant systems, suitable for a range of projects. As every project is different however, please contact the Fairview team to discuss project specific requirements and configurations.

The focus is beyond merely fire performance. There are many factors to be considered when designing external walls, including structural engineering, spread-of-fire, FRL's, insulation, etc. The AS5113 test and system is a critical input into the design decision but does not supplant these requirements.

The Vitrashield external cladding system is a complete wall system as required by the AS5113 test, from internal plasterboard to the external cladding. The systems provide an essential basis for designing a safe and compliant external wall. While Fairview offers a selection of systems that have already achieved EW classification to suit a variety of wall requirements, we are also able to assist with testing, engineering and assessments to achieve the safest and simplest compliant solution on an individual project basis





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## 5.2 SYSTEM 1001

1001 is the first Vitrashield system to be classified EW under AS5113 and the first cassette panel system to achieve this in Australia.

The system features a non-combustible sarking and a 6mm insulated wall wrap. The wall structure is a typical lightweight steel frame wall, glass wool insulation and standard plasterboard. The panels are fixed in a classical cassette design onto steel tophats, which also act as a cavity barrier.







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### 5.3 SYSTEM 1002

1002 is the second of the Vitrashield systems to be classified EW under AS5113 and particularly designed as a cost-effective option for façade remediation works.

The system contains a 70mm PIR insulation, meaning re-cladding projects with combustible insulation now have the option of leaving the insulation safely in place. This minimises project timeframe and costs, and makes less impact on the building structure and owners.

The wall structure is a lightweight steel frame wall, clad internally with standard plasterboard. Externally the wall features non-combustible sarking and a 6mm insulated wrap, clad over with the Vitrashield panels. Also incorporated is intumescent cavity barriers at floor levels.





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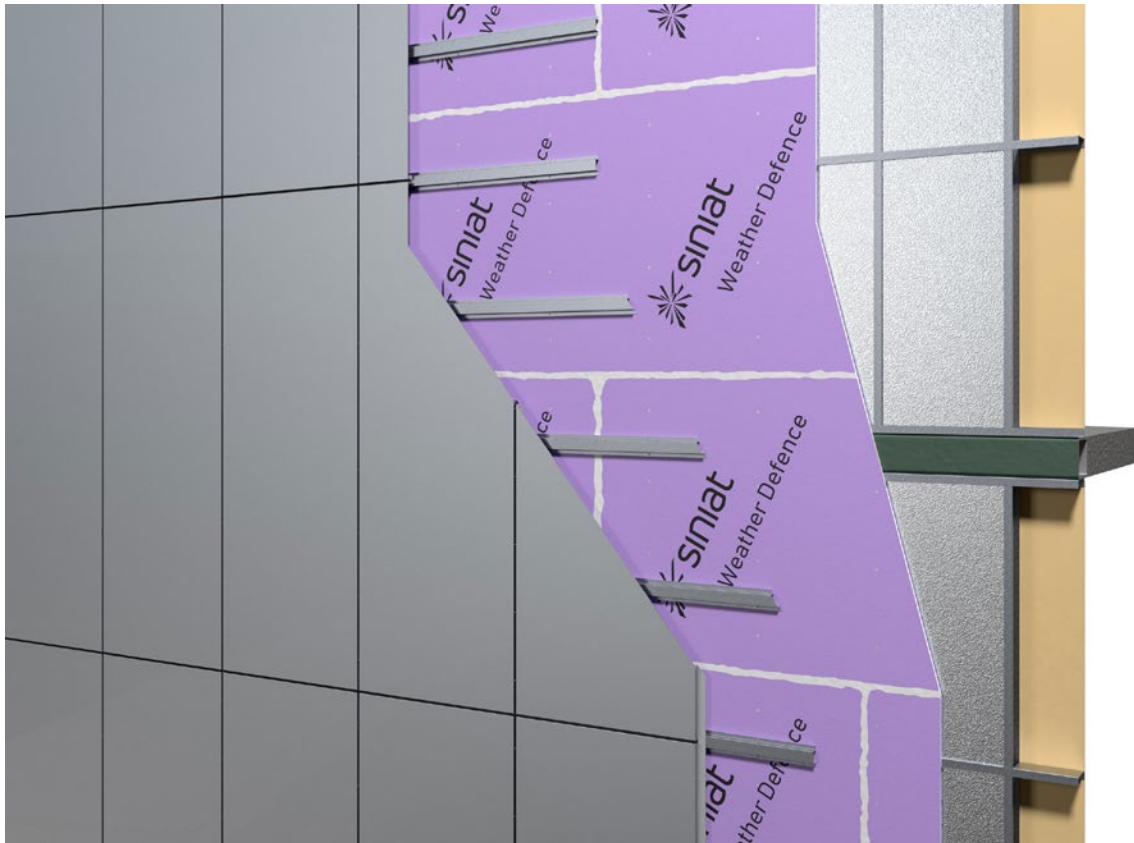
AS5113 COMPLIANT CLADDING SYSTEM / MANUFACTURED BY FAIRVIEW

## 5.4 SYSTEM 2001

2001 is the first of the Vitrashield systems to feature the Siniat® Weather Defence® exterior sheathing board. Deemed non-combustible, the board is waterproof, durable and – significantly – breathable, helping to achieve the Condensation Management requirements of the 2019 BCA. Additionally, Weather Defence is uniquely fast and easy to install.

The wall structure is again a typical lightweight steel frame wall, insulation and standard plasterboard. The panels are fixed in a classical cassette design onto steel tophats.

2001 has been tested with PIR insulation, again achieving a perfect reclad solution where other combustible wall components have been used behind the cladding. Using a non-combustible insulation also is not an issue.



# 6. DESIGN CONSIDERATIONS

## 6.1 BCA COMPLIANCE

All building systems and designs must comply with the Building Code of Australia and relevant legislation. The BCA is a performance-based building code, setting out various performance requirements for building solutions.

Performance Requirement CP2 of NCC Volume One requires, among other things, that a building must have elements that will avoid the spread of fire in a building and between buildings, in a manner appropriate for that building.

The Vitrashield system is tested by internationally accredited, NATA approved facilities and designed to provide an external wall system suitable for compliance to CP2. This is through a performance solution using Verification Method CV3, requiring testing to AS 5113 and achieving an EW classification.

Alternatively, a fire safety engineer may choose to use the results of the AS5113 test as part of the basis for a performance solution outside of CV3. However, as with all large test results conducted in accordance with AS 5113, the results are only applicable to construction assemblies built the same as that which was tested.

## 6.2 SYSTEM VARIATION

While CV3 requires the wall be built exactly as tested, variations to the system may be required to meet other project specific requirements of the external wall. These are possible if suitably reviewed, engineered and signed off as part of the performance solution.

## 6.3 RECLADDING

The Vitrashield panel is impervious to flame attack, making it the ideal product for rectification projects, 'shielding' the existing wall structure. The rectification purpose is to mitigate risk, from both life safety and property damage, meaning these projects need to be conducted on a performance basis.

Vitrashield's AS 5113 testing provides an excellent data source and evidence for fire safety engineers, helping to guarantee a safe and successful reclad.

Vitrashield has similar finishes, installation methods and panel widths to traditional aluminium composite panels, meaning it can easily be used on the same basic structure.

Initial testing has shown it can protect combustible products inside the wall system, meaning less product replacement needs to occur and a better performing wall can be maintained.

# 7. COMPONENTS

## 7.1 VITRASHIELD PANEL

WIDTH	LENGTH	THICKNESS
1250	2500 3200 4000	4mm
1570	2500 3200 4000	

**CUSTOM SIZES ARE AVAILABLE, PLEASE SPEAK TO THE FAIRVIEW TEAM**

The components incorporated in the Vitrashield system are as follows:

COMPONENTS	SYSTEM 1001	SYSTEM 1002	SYSTEM 2001	SUPPLIED BY FAIRVIEW
<b>WALL SYSTEM</b>				
0.7mm BMT Vitrashield Zed angle in 'High' and 'Low' format	✓	✓	✓	✓
0.75mm BMT Vitrashield tophat, 35mm x 50mm	✓	✓	✓	✓
TBA Firefly (breathable) 6mm thick Vulcan Fire Barrier	✓	✓		
TBA Firefly (breathable) Non-combustible sarking	✓	✓		
TBA Firefly Intubatt	✓	✓		
Siniat Weather Defence			✓	✓
92mm 1.15BMT Steel framing	✓	✓	✓	
R2.7 Knauf Earthwool insulation	✓			
PIR Insulation		✓ (70mm)	✓ (80mm)	
10mm non- fire-rated plasterboard	✓	✓	✓	
50x30 0.7BMT galvanised steel angle	✓	✓	✓	✓
Galvanised sheet flashing	✓	✓		
<b>FIXINGS</b>				
16mm panhead class 4 self-drilling screw* ( <i>panel installation</i> )	✓	✓	✓	✓
22mm buttonhead self-drilling screw 8g ( <i>TBA wall wrap fixing</i> )	✓	✓		✓
25mm hexhead self-drilling screw* ( <i>tophat installation</i> )	✓	✓	✓	✓
Ceramic Coated Self-drilling plasterboard screw ( <i>Weather Defence</i> )			✓	

## 7.2 SYSTEM COMPONENTS AND ACCESSORIES



### VITRASHIELD STEEL ZED ANGLES

The zed angles are used for fixing the Vitrashield panel cassettes to the tophats. Fairview has specifically designed the Vitrashield Zed Angles for practicality, durability, strength and ease of install.



### VITRIFIX TOPHAT

The tophat is used to fix the Vitrashield panel to the structural framing. Designed for strength and ease-of-use, it also acts as a cavity barrier at the horizontal panel joints.



### STEEL ANGLE

The steel angle is used to finish the Vitrashield panels up against another cladding type etc.



### TBA VULCAN WRAP

The TBA Firefly Vulcan Wrap is a UK manufactured wall wrap, acting to insulate the frame and as a thermal break between tophats and framing, minimising thermal movement in the structure. For more information visit [www.tbafirefly.com.au](http://www.tbafirefly.com.au)



### TBA SARKING

The TBA Firefly sarking acts to control moisture and condensation. For more information visit [www.tbafirefly.com.au](http://www.tbafirefly.com.au)



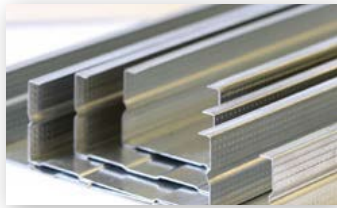
### TBA INTUBATT

The TBA Intubatt is used in small pieces to seal off any openings between the tophats acting as horizontal cavity barriers.



## **SINIAT WEATHER DEFENCE®**

The Siniat Weather Defence® is used as a sheathing board to provide a thermal break, breathability, and waterproofing for excellent management of moisture through the system. For more information visit <https://www.siniat.co.uk/en/products-and-systems/products/external-boards/weather-defence>.



## **STEEL FRAMING**

Used as the main wall structure between slabs, in a non-load bearing scenario. Tested with 1.15BMT steel stud and noggins.



## **INSULATION**

Insulations used can be PIR or non-combustible glass wool or mineral wool (test or assessment required if not standard system). The insulation is used to insulate the wall structure and achieve rear face temperature requirements.



## **PLASTERBOARD**

The specified plasterboard is standard grade, 10mm thickness. This allows for increased options as increased thickness or fire rated grades only serve to improve the system further.



## **GALVANISED FLASHING**

Used above window and door openings to protect the wall cavity from direct flame impingement, particularly beneficial for aluminium frames which would melt in a fire scenario.



## **FIXINGS**

A range of fixings have been used in the fire testing, which provide the minimum specifications. These may need to be increased in gauge or fixing frequency depending on project specific engineering requirements.

# 8. PERFORMANCE

## 8.1 FIRE

### AS5113

Vitrashield is the first metal cladding system in Australia to achieve an EW Classification having successfully passed the rigorous criteria of the AS5113 full-scale fire test.

Vitrashield is a first choice for use where EW rated systems must be used; including hospitals, schools and multi storey high-rise developments.

CLASSIFICATION CRITERIA	RELATED CLASSIFICATION MEASURE	SYSTEM 1001	SYSTEM 1002	SYSTEM 2001
5.4.5(a) $T_{w5m}$	$\leq 600^{\circ}\text{C}$	Maximum $460^{\circ}\text{C}$ at 15 minutes 50 seconds after crib ignition	Maximum $426^{\circ}\text{C}$ at 11 minutes 30 seconds after $t_s$	Maximum $470^{\circ}\text{C}$ at 19 minutes 01 seconds after $t_s$
5.4.5(b) $T_{\text{cavity}5m}$ , Panels	$\leq 250^{\circ}\text{C}$	Maximum $206^{\circ}\text{C}$ at 19 minutes 00 seconds after crib ignition	Maximum $140^{\circ}\text{C}$ at 20 minutes 50 seconds after $t_s$	Maximum $115^{\circ}\text{C}$ at 21 minutes 41 seconds after $t_s$
5.4.5(b) $T_{\text{cavity}5m}$ , Glasswool/ Steel Framing	$\leq 250^{\circ}\text{C}$	Maximum $58^{\circ}\text{C}$ at 40 minutes 45 seconds after crib ignition	Maximum $34^{\circ}\text{C}$ at 51 minutes 46 seconds after $t_s$	Maximum $43^{\circ}\text{C}$ at 57 minutes 40 seconds after $t_s$
5.4.5(c) $T_{\text{unexposedside}0.9m}$	$\leq 180^{\circ}\text{C Rise}$	Maximum $59^{\circ}\text{C}$ at 30 minutes 35 seconds after crib ignition	Maximum $50^{\circ}\text{C}$ at 49 minutes 01 seconds after $t_s$	Maximum $46^{\circ}\text{C}$ at 29 minutes 40 seconds after $t_s$
5.4.5(d) flaming	No flaming	No Flaming	No Flaming	No Flaming
5.4.5(d) openings	No openings	No Openings	No Openings	No Openings
5.4.5(e) spread	No spread beyond specimen	No Spread	No Spread	No Spread
5.4.5(f) debris flaming	$\leq 20\text{ s}$	No Flaming Debris	No Flaming Debris	No Flaming Debris
5.4.5(q) debris mass	$\leq 2\text{ kg}$	0 kg	0 kg	0 kg
Classification		EW	EW	EW

# 9. STRUCTURAL

## 9.1 INTRODUCTION

The Vitrashield system is a non-load bearing façade system consisting of Vitrashield cassette panels and zed angles, supported by steel tophats, mounted on a lightweight cold-formed steel stud system.

This section provides tables to assist the designer in the selection of panel and tophat spans and the associated fixing details, to ensure the panels remain fit for purpose under the imposed design actions (in accordance with AS1170).

The design and approval of the steel stud system and related tophat fixings and spanning is beyond the scope of this information, and must be designed and assessed by the project engineer or the steel framing provider.

## 9.2 DESIGN TABLES

The following tables set out the maximum zed angle spans (tophat spacing) and maximum panel spans in a variety of configurations. Both tables need to be reviewed as either the panel or the zed angles may govern the design.

The suggested process to use these tables is as follows:

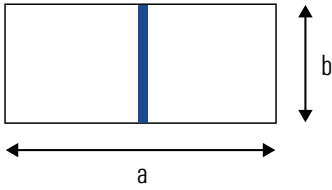
ROLE	DESIGNER	INSTALLER
Step 1	Identify required project wind loadings and intended panel layout	
Step 2	Based on the design intent (panels installed portrait or landscape), review the zed angle tables to identify the best tophat layout and spacing that meets the wind loads.	Review the Vitrashield panel tables to confirm the designed panel sizes are possible.
Step 3	Obtaining the maximum cassette width from the above, look at the panel tables to identify the maximum panel length and whether or not stiffening is required.	Review the zed angle tables to identify the required tophat configuration, spacing and fixings required.
Step 4	Consult with the project engineer to confirm the steel stud layout and tophat spanning and fixings	



## 9.3 VITRASHIELD PANEL DESIGN TABLE WITH STIFFENER

TO AS/NZS 1170.2

### Cassette Configuration



b = span of panel  
a = length of panel  
(Max a = 4000mm)

■ Stiffener  
50x20x1.6 RHS C450LO  
Deflection limit b/250

### SCP Properties

E	=	200000 MPa
t	=	4.0mm
t <sub>skin</sub>	=	0.35mm
t <sub>eff,s</sub>	=	2.649mm
t <sub>eff,d</sub>	=	3.039mm
I	=	2339mm <sup>4</sup> / m
Z	=	1169mm <sup>3</sup> / m
EI	=	468Nm <sup>2</sup> / m
Φ <sub>fy</sub>	=	270MPa
Φ <sub>M</sub>	=	0.316kNm / m

### Comments

Nominal panel overall thickness  
Base metal thickness of skin  
Effective thickness for strength calculations  
Effective thickness for deflection calculations  
G300 steel - f<sub>y</sub> = 300 MPa / f<sub>u</sub> = 340 MPa  
Moment capacity in one-way bending per metre width

### Tophat minimum steel specification

Grade G250: f<sub>y</sub> = 250 MPa  
f<sub>u</sub> = 320 MPa  
t = 1.1 mm BMT

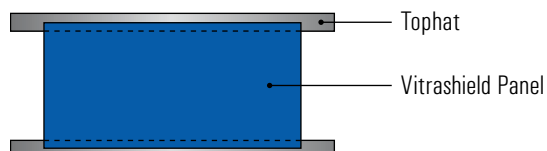
Cassette Size			Maximum Wind Pressure		Minimum Total No. of Dia. 5 mm Rivets Required per Cassette	Connection of Z-Sections to Tophats			
Panel Width b (mm)	Panel Length a (mm)	a/b	Strength p <sub>u</sub> (kPa)	Serviceability L/60 limit, p <sub>s</sub> (kPa)		Max. Spacing of Screws Fixing Cassette to Tophats (mm)			
						No. 8	No.10	No.12	No.14
600	1200	2.0	9.000	9.000	10	110	130	150	170
600	1500	2.5	9.000	6.501	12	110	130	150	170
600	1800	3.0	9.000	5.047	14	110	130	150	170
600	2100	3.5	9.000	4.307	16	110	130	150	170
600	2400	4.0	8.428	3.892	18	110	140	160	180
600	2700	4.5	8.007	3.642	18	120	140	170	190
600	3000	5.0	7.739	3.481	20	120	150	170	200
600	3300	5.5	7.559	3.374	22	130	150	180	200
600	3600	6.0	7.434	3.299	22	130	160	180	210
600	4000	3.3	7.321	3.232	24	130	160	180	210
900	1800	2.0	7.363	2.078	18	90	100	120	140
900	2100	2.3	6.279	2.078	18	100	120	140	160
900	2400	2.7	5.236	1.746	18	120	150	170	190
900	2700	3.0	4.606	1.495	18	140	170	190	220
900	3000	3.3	4.202	1.335	18	150	180	210	240
900	3300	3.7	3.933	1.228	18	160	200	230	260
900	3600	4.0	3.746	1.153	18	170	210	240	270
900	4000	4.4	3.576	1.086	18	180	220	250	290
1200	2400	2.0	3.106	0.487	14	160	190	220	250
1200	2700	2.3	3.106	0.455	14	160	190	220	250
1200	3000	2.5	3.106	0.435	16	160	190	220	250
1200	3300	2.8	2.840	0.422	16	170	210	240	270
1200	3600	3.0	2.591	0.412	16	190	230	260	300
1200	4000	3.3	2.364	0.404	16	210	250	280	300



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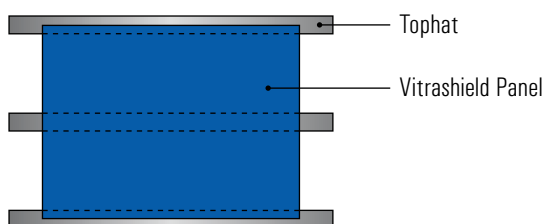
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## 9.4 VITRASHIELD ZED ANGLE DESIGN TABLES



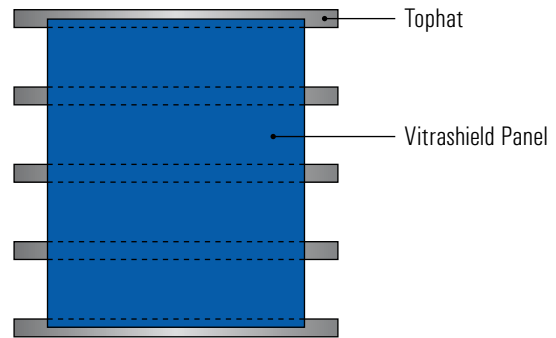
### OPTION 1

CASSETTE WIDTH, B (MM)	+VE ULS $W_u$ (KPA)	-VE ULS $W_u$ (KPA)	MIN. SCREW REQUIREMENT	SLS, L/250 LIMIT $W_s$ (KPA)
1200	0.706	0.842	1x No.10	0.363
900	1.674	1.995	1x No.10	1.147
600	5.650	6.733	1x No.10	4.713
450	9.000	9.000	1x No.10	6.300
300	9.000	9.000	1x No.10	6.300



### OPTION 2

CASSETTE WIDTH, B (MM)	+VE ULS $W_u$ (KPA)	-VE ULS $W_u$ (KPA)	MIN. SCREW REQUIREMENT	SLS, L/250 LIMIT $W_s$ (KPA)
1200	1.835	2.187	1x No.10	1.531
900	4.350	5.183	1x No.10	3.628
600	9.000	9.000	1x No.10	6.300
450	9.000	9.000	1x No.10	6.300
300	9.000	9.000	1x No.10	6.300



**OPTION 3**

	CASSETTE WIDTH, B (MM)	+VE ULS $W_U$ (KPA)	-VE ULS $W_U$ (KPA)	MIN. SCREW REQUIREMENT	-VE ULS $W_U$ LIMIT (KPA) for 2x No.10	SLS, L/250 LIMIT $W_S$ (KPA)
Tophat Spacing 300	1200	7.534	6.539	3x No.14	3.324	4.577
	900	9.000	8.721	3x No.14	4.432	6.105
	600	9.000	9.000	3x No.10	6.648	6.300
	450	9.000	9.000	2x No.12	8.864	6.300
	300	9.000	9.000	2x No.10	-	6.300
Tophat Spacing 450	1200	4.534	3.805	3x No.14	2.216	2.663
	900	6.045	5.073	3x No.14	2.955	3.551
	600	9.000	7.610	3x No.14	4.432	5.327
	450	9.000	9.000	3x No.12	5.909	6.300
	300	9.000	9.000	2x No.12	8.864	6.300
Tophat Spacing 600	1200	2.550	2.140	2x No.14	1.662	1.498
	900	3.401	2.854	2x No.14	2.216	1.998
	600	5.101	4.281	2x No.14	3.324	2.996
	450	6.801	5.707	2x No.14	4.432	3.995
	300	9.000	8.561	2x No.14	6.648	5.993
Tophat Spacing 900	1200	1.134	0.951	2x No.10	-	0.666
	900	1.511	1.268	2x No.10	-	0.888
	600	2.267	1.902	2x No.10	-	1.332
	450	3.023	2.537	2x No.10	-	1.776
	300	4.534	3.805	2x No.10	-	2.663
Tophat Spacing 1200	1200	0.638	0.535	2x No.10	-	0.375
	900	0.850	0.713	2x No.10	-	0.499
	600	1.275	1.070	2x No.10	-	0.749
	450	1.700	1.427	2x No.10	-	0.999
	300	2.550	2.140	2x No.10	-	1.498

# 10. DURABILITY

## 10.1 INTRODUCTION

Durability is defined in the ABCB Handbook as "...the capability of a building or plumbing installation to perform its function over a specified period." The ABCB handbook also provides this context for consideration: "Durability is not an inherent property of a material or component. It is the outcome of complex interactions among a number of factors."

For building components, durability is described in terms of design life. The durability performance of a building component is determined by its ability to remain fit-for-purpose over its design life in the environment it is subjected to and with appropriate maintenance.

The minimum design life for a wall cladding system on a building with a normal design life category is 15 years (refer to ABCB Handbook Table 3.1).

## 10.2 PRODUCT TESTING

The Vitrashield panel has undergone extensive exposure and corrosion testing to demonstrate its long-term performance and suitability for application. The extensive testing regime includes:

- Salt spray exposure
- Freeze/thaw cycling
- Water submersion
- Long-term heat exposure
- Fatigue cycling
- UV exposure

## 10.3 EVALUATION

Testing has confirmed a minimum design life for durability of at least 15-25 years in C2 and C3 corrosivity zones (Ref.: AS4312), subject to appropriate use and maintenance.

The Vitrashield cladding system can be used in C4 zoning (such as coastal areas) with additional precautions taken to ensure panel durability:

- Applying a thick zinc-rich coating to the exposed steel edges after panel machining (at the cut and grooved locations); and
- Ensuring the walls are washed down at least twice a year, to remove salt and contaminant build-up, particularly at the joints.

The evaluation method for assessing the durability of Vitrashield panels is EOTA Technical Report TR038, "Assessment procedure for durability of thin metallic composite panels". This is a supporting reference document to European Technical Approval Guidelines (ETAG), assuming a 25yr design life.

Refer to expert assessments by Pacific Testing (Report 295/19) and Enertren (report FAR-068) for further details.

## 10.4 SUPPORT STEEL FRAMING

The support steel framing should be at a minimum protected from corrosion in accordance with the Building Code of Australia (BCA) Volume 2, Part 3.4.2 – 'Acceptable Construction Practise' Performance Requirements.

For the Vitrashield System, the support framing is considered located within the building envelope.

# 11. INSTALLATION DETAIL

## 11.1 SEQUENCE

Construction of the Vitrashield 1001 system should be conducted in the following order:

1. Install steel stud frame, make sure plumb and flush with slab edges.
2. Install the TBA Vulcan wrap in vertical strips, overlapping 100mm, and fixing to the frame at 150mm centres.
3. Install the TBA sarking, running horizontally, working from bottom to top with a 150mm overlap. Tape joints with foil tape.
4. Identify which horizontal panel joints are required to act as cavity barriers. Install these tophats, filling the gaps in the joints with TBA Intubatt.
5. Install remaining tophats as per engineering requirements.
6. Fabricate panels, making sure the panel corners are tight. Use high and low zeds appropriately with the order of installation.
7. Install panels working from bottom to top, ensuring engineering requirements are met.

Construction of the Vitrashield 1002 system should be conducted in the following order:

1. Install steel stud frame, make sure plumb and flush with slab edges.
2. Install the TBA Vulcan wrap in vertical strips, overlapping 100mm, and fixing to the frame at 150mm centres.
3. Install the TBA sarking, running horizontally, working from bottom to top with a 150mm overlap. Tape joints with foil tape.
4. Identify which horizontal panel joints are required to act as cavity barriers. Install Intuspan cavity barriers along slab edges.
5. Install remaining tophats as per engineering requirements.
6. Fabricate panels, making sure the panel corners are tight. Use high and low zeds appropriately with the order of installation.
7. Install panels working from bottom to top, ensuring engineering requirements are met.

Construction of the Vitrashield 2001 system should be conducted in the following order:

1. Install steel stud frame, make sure plumb and flush with slab edges.
2. Install the Siniat Weather Defence board in accordance with the installation requirements. Make sure joints are well sealed.
3. Install tophats horizontally, at horizontal panel joints and spaced between according to engineering requirements.
4. Install Cavity Barriers along slab edges.
5. Fabricate panels, making sure the panel corners are tight. Use high and low zeds appropriately with the order of installation.
6. Install panels working from bottom to top, ensuring engineering requirements are met.



# 12. INSTALLATION CONSIDERATIONS

## GENERAL

- Panels must not be installed across any structure control joint. Panel layout is to be in harmony with the structure.
- Panels are to be installed as to provide for all expansion and contraction of the components.
- Consideration must be given to contact between dissimilar materials to ensure reactions and corrosion does not occur.

## VITRASHIELD PANELS

- All sheets should be installed in the same direction as marked on the protective film to prevent possible finish variations.
- As minor variation can occur between production runs, it is recommended to place total requirement for a project in one single order to ensure colour consistency.
- The panel returns should not be caulked before the protective film has been removed.
- Corners of panel cassettes should be either fixed together or the zed angles fixed into the same tophat for maximum strength and windloading.
- Care is to be taken to protect panels during installation.

## VITRAFIX TOPHAT

- Tophats should be cut to size prior to installation.
- At control joints the tophats should be discontinuous (with intubatt filling if at a cavity barrier level for 1001).

## SEALANT

- Sealants must be compatible with all surfaces being bonded.
- Use specified sealant with Siniat Weather Defense®.

## TBA VULCAN WRAP

- Installed vertically with 100mm overlap.
- Push firmly into internal corners to prevent ripping or penetration when installing tophats.

## TBA SARKING

- Minimum 150mm overlap between levels.
- All joints to be appropriately sealed with foil tape.
- Provide reinforcement where the wrap folds around sharp objects.

## **SINIAT WEATHER DEFENCE**

- To be installed in accordance with manufacturers requirements.
- Make sure all joints are well sealed with specified sealant.

## **FIXINGS**

- Refer to the design tables in this manual for minimum fastener specifications.
- Screw fixings shall comply with AS356 Part 1 and have corrosion resistance applicable to the project corrosivity zone in accordance with AS3566 Part 2.
- Detailing must consider the size of the screw fixings when determining joint sizes:
  - No. 8 and No. 10 screws – minimum 12mm joint width.
  - No. 12 and No. 14 screws – minimum 16mm joint width.

## **STEEL FRAMING**

- All steel stud framework components are to be designed in accordance with framing manufacturer's specifications, and AS/NZS4600.

## **GALVANISED FLASHING**

- Extend the full depth of the wall to fully protect cavity in case of a window failure.
- Protective coated to prevent corrosion as required.

## **PLASTERBOARD AND INSULATION**

- To be installed in accordance with manufacturers requirements.
- Ensure there is no gaps in the insulation.

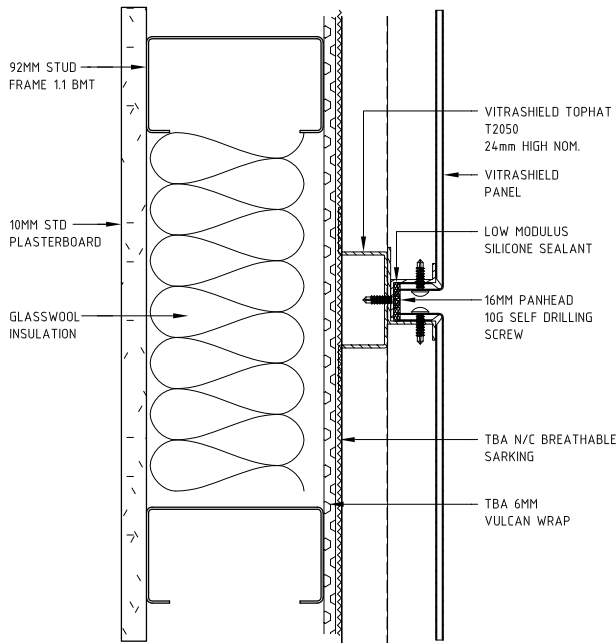




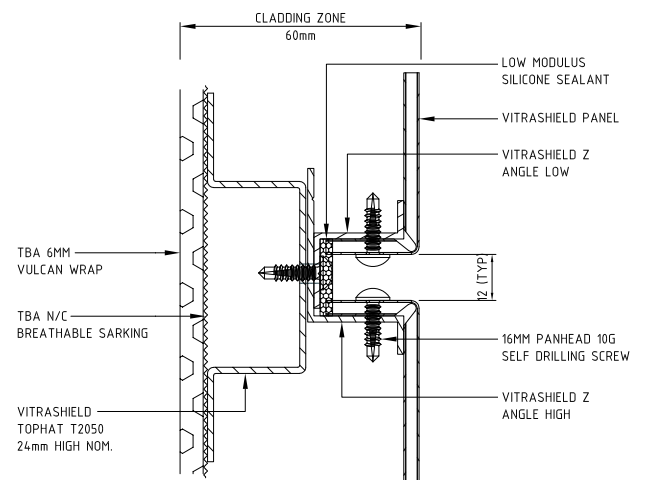
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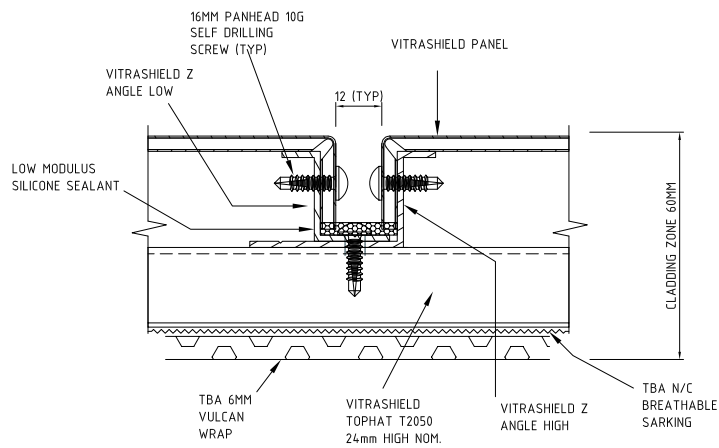
# 13. GENERAL DETAILS



1. TYPICAL WALL SECTION



2. SECTION THROUGH HORIZONTAL JOINT DETAIL

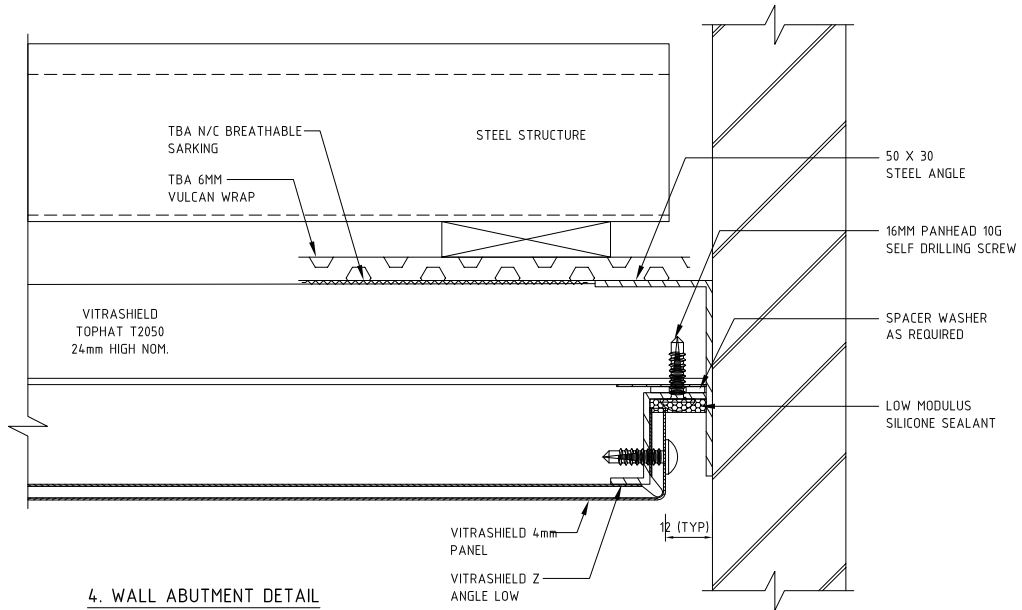


3. VERTICAL JOINT DETAIL

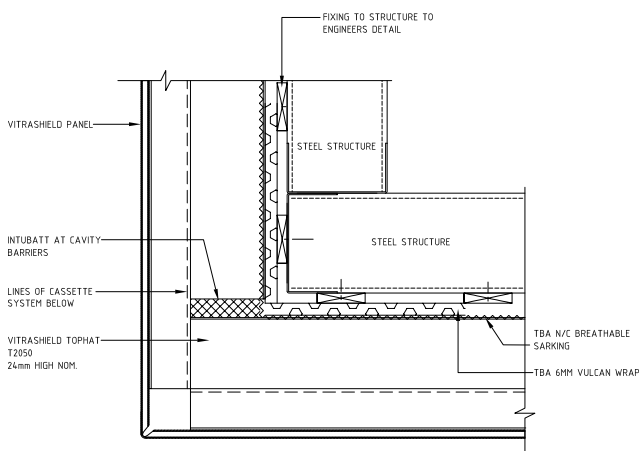


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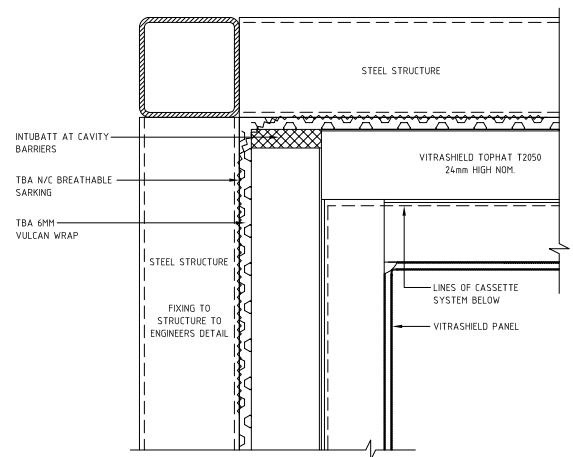
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4. WALL ABUTMENT DETAIL



5. EXTERNAL CORNER DETAIL

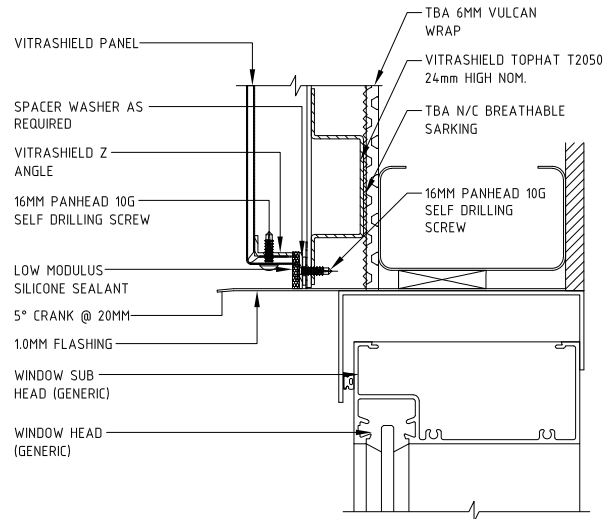


6. INTERNAL CORNER DETAIL

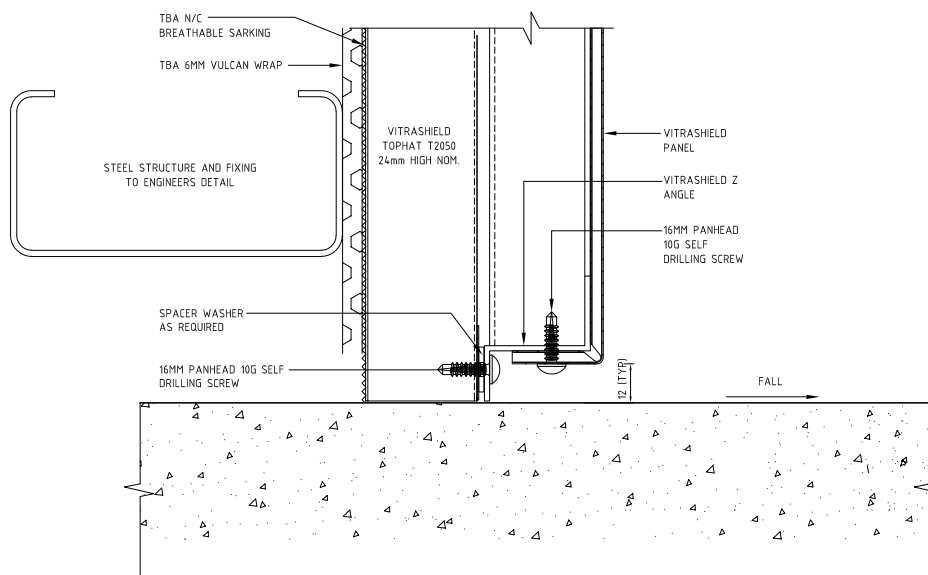


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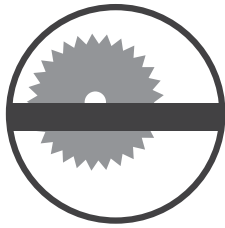


**7. WINDOW HEAD DETAIL**



**8. WALL TO FLOOR DETAIL**

# 14. PANEL FABRICATION



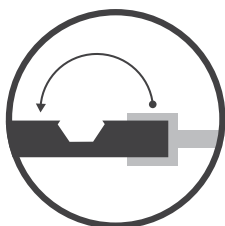
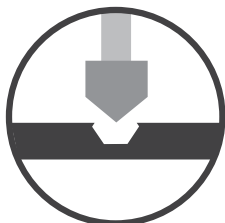
## CUTTING

Vitrashield panels can be cut with identical tooling to that used in cutting Vitrabond FR and similar ACPs. When cutting using CNC equipment, ensure that an up spiral cutter is recommended to assist with swarf removal. There is no requirement for coolant on the cutter or groover.

	TOOLING	FEEDS/SPEEDS	COMMENTS
CNC ROUTER	6.35mm Upspiral Cutter 1 or 2 flute	RPM: 18,000 Speed 6-10 m/min	Clean panel edges if not all swarf is removed.
FESTOOL	Use Festool saw blade for ferrous metal	10-15m/min	Orient the panel so the blade is cutting into the face to prevent burring.

Carbide cutters or cutters featuring a coating to increase tool hardness or durability are recommended to maximise tooling life.

**Note:** Under no circumstances should a grinder be used in the fabrication or installation of the Vitrashield panel.

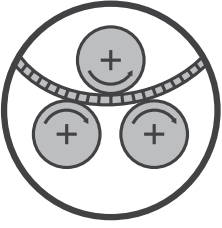


## GROOVING

Grooving Vitrashield panels is a simple and easy process – very similar to grooving traditional FR core ACPs such as Vitrabond FR.

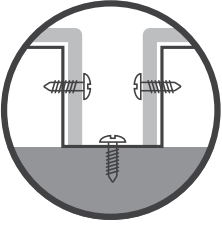
	TOOLING	FEEDS/SPEEDS	DEPTH	COMMENTS
CNC ROUTER	90 degree V-groover with 2-3mm flat	RPM: 18,000 Speed 6-8 m/min	0.3mm of core material should remain at base of groove	Clean panel edges if not all swarf is removed.
FESTOOL	Use Festool saw blade for milling ACP	5-10/min		Take care not to overheat the blade. Groove on a flat, even surface to ensure depth accuracy and consistency.

It is important that the tool be kept sharp as blunt tooling increases heat and pressure on the panel, which in turn can reduce groove quality.



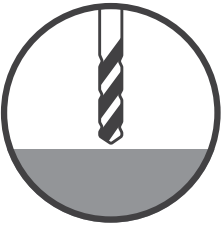
### ROLL BENDING

Vitrashield can be screwed with conventional stainless steel or galvanised screws for metal. For outdoor use, allow for thermal expansion.



### SCREWING

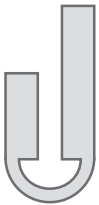
Vitrashield panel can be drilled with centre point twist drills normally used for aluminium or steel. Use High-Speed Steel (HSS) drill bits.



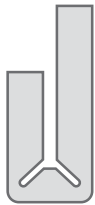
### DRILLING

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

## 15. EDGE CLOSE-OUT & TREATMENT DETAILS



A



B



C



D



30

# 16. PANEL SPECIFICATION

## 16.1 MATERIAL PROPERTIES

TEST STANDARD REFERENCE	DESCRIPTION	RESULTS
	Weight	10.2kg/m <sup>2</sup>
ASTM C 297	Flatwise tensile strength	Average = 3.4 MPa
ASTM D 1781	Climbing drum peel – longitudinal	Average = 19.8 kg·mm/mm
ASTM D 1781	Climbing drum peel – transverse	Average = 20.6 kg·mm/mm
ASTM C393	Flexural strength and stiffness – longitudinal	Average = 2.5 MPa
ASTM C393	Flexural strength and stiffness – transverse	Average = 2.6 MPa
Mahaffey	4-point bend test – longitudinal	Average = 138.51 N·m
Mahaffey	4-point bend test – transverse	Average = 155.38 N·m
AS4459.8	Linear thermal expansion of ceramic tiles – longitudinal	Average = 18.6x10 <sup>-6</sup> m/m·K
AS4459.8	Linear thermal expansion of ceramic tiles – transverse	Average = 18.7x10 <sup>-6</sup> m/m·K
TR 38 Test Clause 4.1 / Initial	Delamination resistance - climbing drum peel – longitudinal	Average = 194.3 Nm/m
TR 38 Test Clause 4.1 / Initial	Delamination resistance - climbing drum peel – transverse	Average = 202.0 Nm/m
TR 38 Test Clause 4.3 / Initial	Flexural stiffness - static 4 point bending test	Mean deflection, δINI = 17.17 mm
TR 38 Test Clause 4.3 / Exp 4.3	Decay of flexural stiffness - static 4 point bending test – short-term heat: 80°C, 1hr	Mean deflection, δAGED = 17.33 mm
TR 38 Test Clause 4.4 / Initial	Resistance of routed and returned edge - 3 point bending test	Loads for fatigue test cycles (Test No. 25): Fu,5 = 218.93 N Fmax = 109 N Fmin = 43 N
TR 38 Test Clause 4.4 / Exp 4.4	Decay of resistance of routed and returned edge - 3-point bending – fatigue: 10,000 cycles 20-50% load capacity	10,000 cycles, no evidence of cracks, delamination or breakage. FAGED U,5 = 257 N
TR 38 Test Clause 4.6.1 / Exp 4.6.1: ASTM B117	Infiltration - salt spray (fog) Test method: ASTM B117-16 NaCl solution concentration – 5(±1)% pH value – 6.5-7.2 Chamber temperature – 35(±2)°C	500 hrs, no blistering or corrosion 1000 hrs, evidence of blistering – <i>awaiting receipt of samples for examination and conclusion</i>
TR 38 Test Clause 4.7 / Exp 4.7	Retention of colour and gloss - accelerated aging by heat: 72h at 90°C	Retention of colour: ΔE = 0.10 Retention of gloss: 98%

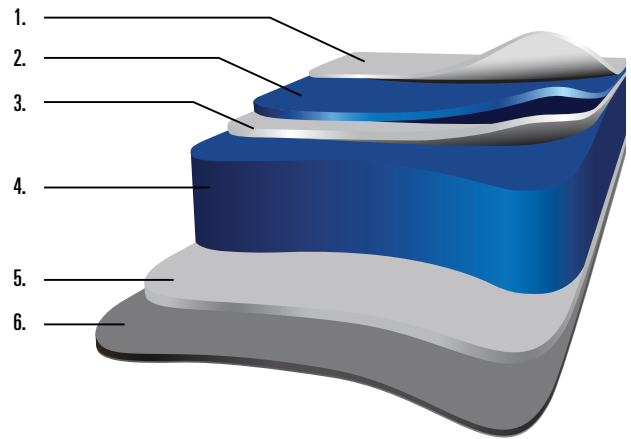


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## 16.2 TYPICAL PANEL COMPOSITION

1. Protective film
2. PVDF Coating
3. 0.35mm BMT zinc/aluminium coated steel skin
4. Mineral compound core
5. 0.35mm BMT zinc/aluminium coated steel skin
6. Polyester Protective Coating



## 16.3 SKINS

Vitrashield panel's front and rear steel skins are 0.35BMT for 1250 widths and 0.4BMT for 1570 widths.

## 16.4 CORE

The Mineral compound core used in Vitrashield is comprised of a minimum of 75% inert mineral fibre and a maximum 25% polyethylene used as a binder.



# 17. MISCELLANEOUS

## 17.1 MANUFACTURING QUALITY

A dedication to the total fulfilment of the expectations of both our clients and our customers is reflected in our complete quality control system, beginning at the point of specification and continuing through to delivery of our warranted products. All activities are carried out in a manner which:

- Ensures that our products and services are of the highest possible standard.
- Creates a culture of continuous improvement to our products and systems through the application of the best quality practices.
- Vitrashield panel is manufactured to the ISO 9001 quality standard.

## 17.2 HANDLING AND STORAGE

- Considerable care should be taken in the handling of Vitrashield panels.
- A minimum of two people should be used when sliding large sheets to avoid scratching.
- To prevent surface damage when stacking panels, there should be nothing between the panels.
- Vitrashield panels should be stored in a cool and dry area where temperature is relatively stable.
- Pallets of Vitrashield panels should be stored horizontally with adequate support to prevent sagging.
- Stacked pallets should be identically sized and not more than four (4) pallets high.

## 17.3 SUSTAINABILITY

All Fairview products have been developed with the health of the environment and community in mind. As part of our commitment to using recyclable or reusable materials wherever possible; all Vitrashield panels are partially recyclable.

# 18. CLEANING AND CARING

## 18.1 RECOMMENDED CLEANING AGENTS

- Mineral Spirits
- Organic Cleaners
- PH-Neutral Solvents

## 18.2 KEEP YOUR WARRANTY FRESH

Maintaining your Vitrashield finish is an important component to maintaining your warranty. Document each time you clean your Vitrashield panels.

Cleaning frequencies are based on project location and are provided in the warranty.



## DISCLAIMER

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**AUGUST 2020**