

> 2022 - 2023

# Glass Guide™

**Viridian**   
we ♥ glass™



**we**♥**glass**<sup>™</sup>

The Glass Guide<sup>™</sup> is a reference point for industry professionals wanting information on Viridian's glass products.

We know that natural light creates healthier, happier and more connected spaces. We also know that demand for comfortable and more energy efficient spaces is growing. Glass can help solve building challenges when it comes to natural light, comfort and thermal efficiency – and this is what excites and inspires us.









Today, we are the largest glass processor in Australia. Everything we do is driven by our passion for glass. We share this passion by servicing the glass needs of our customers and those they serve.

Put simply, we love glass.



Throughout this guide you will see these QR codes, these link to the information on the Viridian Glass website.

From time to time we update our product information, so accessing our website in conjunction with this guide will support you to access the most up to date information.

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Cover Photo: Future Food System, Melbourne





# Selecting the right Glass

The Glass Guide™ has been designed to provide building designers with a broad range of information relating to glass types, sizes, properties, behaviours and configurations in Viridian's product range. Due to the variety of issues that are unique to each project, Viridian strongly recommends that prior to commencing your project, you or your glazing professional discuss the specifications of your project and the suitability of individual Viridian products and make-ups in specific applications.

Glass plays a unique and important role in building design and the environment. It affects design, appearance, thermal performance and occupant comfort. The selection of the right glass is a crucial component of the design process.

By identifying key issues at the design stage, glass products can be selected to match your specific application.

Viridian engineers are available to assist when glass is used in structural applications and systems such as **DécorFloor™**.

## Product Selection and Applications

Viridian products are categorised by their primary application benefit so that it is easy to find and compare products. Each category is identified by a symbol representing the benefit. Many glass products are multi-purpose or can be manufactured to perform many functions.

✓ **Glass plays a unique and important role in building design and the environment.**

## Specifying

Some of the key decisions that need to be considered in the selection of glass in facades, interiors and glazing systems are often solar and thermal performance along with appearance e.g. colour, pattern, reflectivity, etc.

This information may lead to a glass product type with additional attributes such as safety, security, decorative and noise control which can be incorporated.

Once the appearance and functional requirements have been developed by the designer, the structural engineer will provide the loads and wind pressure, the mechanical engineer the thermal performance requirements and the acoustic consultant the acoustic requirements.

## Document Limitations

This document is not a comprehensive analysis of all the parameters which may be relevant to any particular glass design. Further information may be required to develop a suitable solution.

## Breakage and Minimising Risk

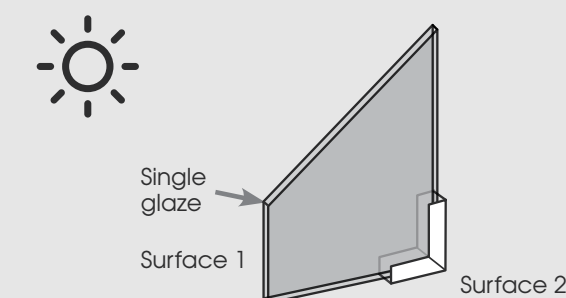
How glass behaves in the case of accidental or intentional breakage must be considered and while glazing codes and regulations provide the minimum requirements, they do not necessarily constitute fitness for purpose.

Attention is drawn to the section in this guide on the heat soak treatment of Viridian toughened glass and the strength recommendations of glass in loading and glazing codes.

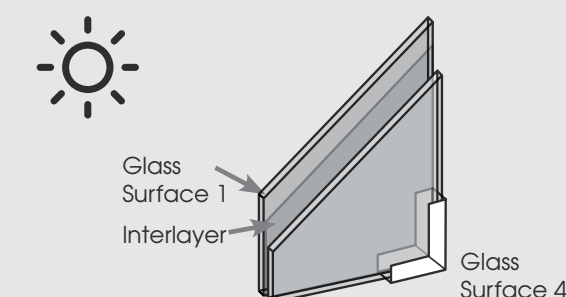
Standards now call for toughened laminated glass in some applications such as high level balustrades and overhead glazing. This type of glass offers the optimum in structural strength and safety in the event of breakage.

Considerations of breakage also need to be considered when determining the type of glass used in ballistic or bomb and blast applications. As long as the type and level of threat can be established, Viridian is able to provide a glass combination to meet your requirements.

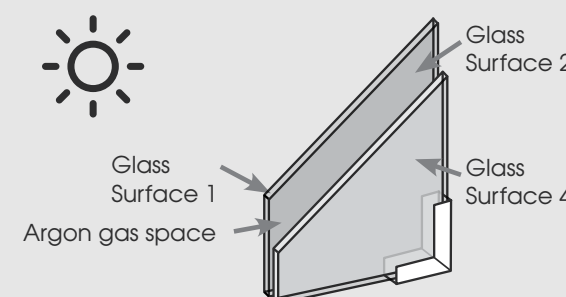
## ✓ Single Glass



## ✓ Laminated Glass



## ✓ Insulated Glass Unit





# Glass types and processing

Viridian is the largest processor of glass products in Australia. We source the very best glass from quality suppliers both here and globally to ensure we have the most innovative products to meet current market demands. See below to find out more about different types of glass and the processes they can go through.

## Float Glass

The float glass process is renowned for flatness and optical clarity. It is available in Clear, Toned, High Performance Toned, Ultra-Clear Low Iron glass and Low E pyrolytic coated.

## Textured/Formatted Glass

This involves embossing a pattern into the glass during manufacture by passing the semi molten glass through a set of rollers prior to annealing. One side remains smooth whilst the texture is applied to the other side. (Refer to the **DécorPattern™** page for range information and sizes).

## Insulating Glass Units

Also known as double glazed units, where two or more panels of glass are bonded to a perimeter spacer. Either air or argon gas fills the space between the glass panes. Their primary benefit is insulation and solar control. Most types of glass can be incorporated into an insulating glass unit.

## Laminated Safety Glass

Comprises two or more layers of glass permanently bonded together with an interlayer. If broken, the interlayer is designed to hold the glass together. Virtually all glass types can be laminated and the thickness and type of interlayer can be varied to provide safety, ballistic, bomb or physical attack resistance. Normal laminated glass can be cut and further processed.

## Toughened Safety Glass

Glass is placed in a roller hearth toughening furnace. It is heated then rapidly cooled, resulting in the glass retaining high compressive stresses. Fully toughened glass is four to five times stronger than ordinary glass and if broken fragments into small blunt-edged pieces. Heat strengthened glass has a lower residual stress and is two times stronger than ordinary glass. It is not a safety glass and if broken it forms large pieces. Toughened and heat strengthened glass cannot be cut and both are resistant to high differential temperatures (180–250°C).





## Toughened Laminated Glass

This is the optimum in safety glass. Each piece of glass is toughened to provide superior structural strength when compared to annealed glass. These pieces are then bonded together using an interlayer, to ensure if the glass breaks the pieces are held together by the interlayer.



Laminated glass is held together when broken



Toughened glass fragments into small blunt-edged pieces when broken

## Coated Glass

This family of high performance glasses consists of permanently bonded microscopically thin layers of metal oxides. There are two types of coating technology used in glass supplied locally:

- **Online, or pyrolitic hard coated.** These coatings are produced by depositing a metallic oxide gas chemical vapour deposition (CVD) during float glass manufacture. This process produces extremely durable coated products that can easily be handled, transported and processed. These products typically combine Low-Emissivity and solar control.
- **Offline coating.** The Airco or magnetron sputtering uses high-grade glass that is placed in a series of vacuum chambers and coated with atoms of alloys such as silver and titanium. The properties of the metals provide solar reflectance and Low-Emissivity.

Coated glass can be supplied as toughened, laminated or incorporated into an insulating glass unit. Under certain light conditions a degree of haze may be apparent when a hard coat is used.

## Mirror

High quality float glass is backed with silver and protective coats of heat cured paint. It can also include a polymer backing for safety.

## Screen Printed Glass

Uses ceramic paint that is screen printed and permanently fused to the toughened glass surface. A broad range of colours and designs are available.

## Printed Glass

The manufacturing process combines hardwearing, ceramic inks, with direct-on-glass digital printing technology. The glass is then toughened for a durable finish.

## Security Glass

Glass designed to resist physical attack, ballistic and bomb blasts. These products are specialist laminates that uses multiple layers of glass and rigid interlayers depending on the resistance required.

# Viridian Benefit Categories



**Core products** – Entry level glass. Glass types include float, laminate and toughened glass



**Energy** – Glass that assists in the solar and thermal control of a building



**Noise** – Glass solutions designed to attenuate sound transmission



**Decorative** – Translucent, coloured, textured, reflective and printed glass for extraordinary design

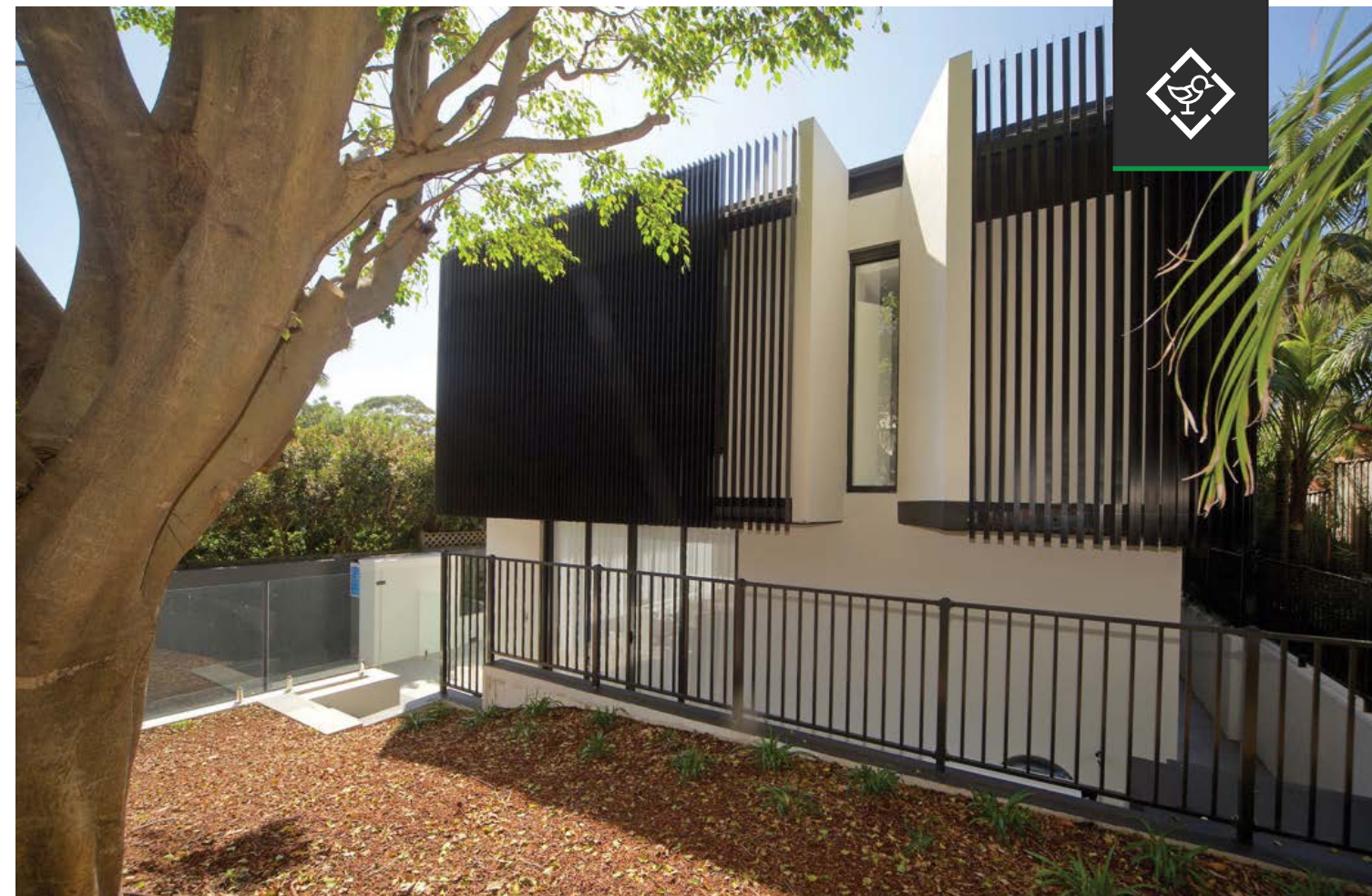


**Security** – Products that are designed to resist physical and ballistics attack



**Structural** – Applications where glass is used structurally such as facades and trafficable glass





> VIRIDIAN GLASS GUIDE™

# Core Products

Setting the standard for quality glass  
with infinite potential.

Products:

VFloat™  
VLam™  
VTough™  
SuperClear™

**Viridian**  
we ♥ glass

**Viridian**  
we ♥ glass





## PRODUCT

# VFloat™

Premium float glass – our foundation product for clear vision & quality

**Start your journey to brighter, more visually spectacular designs with VFloat™.**

**VFloat™ is the starting point in our range. Made using the float process – the benchmark for glass of quality and optical clarity – you can be assured that VFloat™ will make a great contribution to your space.**

VFloat™ sets the standard for quality and vision. It is the name we give our base products that are manufactured using the float glass process.

Glass is produced with brilliant flat surfaces providing clarity, low distortion and high daylight transmission. VFloat™ is manufactured either Clear, Toned or Super Toned.

It is available in a wide range of sizes enabling designers and customers to fill large transparent openings economically.

VFloat™ provides ease of cutting and it is ideal for further processing into a range of products available for general glazing, laminating,

toughening, high performance coating, mirrors and decorative paint finishes.

**VFloat™** Clear provides high light transmission and visibility. It is suitable for conventional and double glazed windows. When safety is required for doors and partitions, it is specified in toughened, laminated, or toughened laminate forms complying with the requirements of Building Codes and Standards.

The toned options offer colour and energy management by reducing solar heat gain, while retaining good daylight transmission and low reflectivity. It also provides reductions in UV.

It can be toughened, laminated or used as a toughened laminate. Similarly it can be incorporated into **ThermoTech™** insulating glass units for enhanced solar and thermal performance. The tone and light transmission will vary depending on the thickness selected and this is a design consideration where colour uniformity is required.

## Considerations

**Thermal strength and safety:** VFloat™ toned glass is designed to improve conditions by reducing glare and solar radiation into buildings. The glass absorbs a proportion of the solar heat, which can lead to glass fracture from thermal stress if adequate precautions are not taken. It is important to note that the edges of solar control glass are not damaged during installation as this increases the risk of thermal fracture.

At an early stage of building design or when specifications are being finalised, Viridian can determine the risk of thermal fracture and can recommend if heat strengthening or toughening of the glass is required.

## Performance Comparison Chart

VFloat™*	VT	U Value	SHCG
Clear	88	5.8	0.82
Light Grey	61	5.8	0.66
Grey	42	5.8	0.58
Bronze	51	5.8	0.65
Green	75	5.8	0.59
SuperClear™	91	5.8	0.89
SuperGrey™	9	5.8	0.36
SuperBlue™	53	5.8	0.52
SuperGreen™	67	5.8	0.53

\*6mm glass thickness

## Features and Benefits

- Clear for maximum daylight transmission and toned for solar control
- High clarity, low distortion with brilliant flat surfaces
- Wide range of sizes and thickness for optimum utilisation
- Used for glazing, toughening, insulating glass units, laminating and coating

## Applications

When supplied in toughened, laminated, or toughened laminate form as required by Standards :

- Windows
- Doors

## How to Specify

- **Select glass name**  
VFloat™
- **Select thickness – process**  
4mm to 19mm – Annealed
- **Select colour**  
Refer to chart below

## Product Range

VFloat™	Thickness (mm)							
	4	5	6	8	10	12	15	19
Clear	◆	◆	◆	◆	◆	◆	◆	◆
Light Grey			◆					
Grey	◆	◆	◆		◆	◆		
Bronze	◆	◆	◆		◆	◆		
Green	◆	◆	◆		◆			
SuperClear™	◆		◆		◆	◆	◆	◆

VFloat™ is a trademark of Viridian Glass





# Safety Glass

✓  
Safety glass is used extensively in both domestic and commercial buildings

The term 'Safety glass' is applied to glazing used to reduce the risk of injury from an accidental impact and consequential glass breakage. Safety glass is used extensively in both domestic and commercial buildings, to the requirements of the Building Codes and is defined by Australian Standards. Viridian offers the following types of safety glass:

- **VLam™** – Laminated safety glass
- **VTough™** – Toughened safety glass
- **VLam™ Toughened** – Toughened laminated safety glass
- **DécorMirror Safe™** – Safety mirror

Critical locations where safety glass must be considered are outlined in Australian Standard AS1288 and New Zealand Standard NZS4223:

- Doors and sidelights
- Glass capable of being mistaken for an opening, and glazing within 500mm of the floor
- Shower and bath enclosures including bathroom windows
- Shopfronts and internal partitions
- Balustrades and stairwells
- Schools and childcare buildings where glass is within 1000mm of the floor
- Special activity buildings, such as gyms and swimming pools

## Australian Standard AS1288 or New Zealand Standard NZS4223 and AS/NZS2208

These standards recognise Grade A safety glass. Laminated, toughened, and toughened laminate glass are all rated Grade A manufactured to AS/NZS2208, offering a high level of protection against injury. Laminated glass also offers security and noise control benefits. Australian Standard AS1288 or New Zealand Standard NZS4223 and the respective Building Codes identify minimum areas where safety glass must be used.

Viridian will only warrant **VLam™**, **VTough™** or **DécorMirror Safe™** as Grade A safety glasses when processed and supplied by a Viridian manufacturing facility.



✓  
**VTough™ toughened Grade A safety glass is up to five times stronger than annealed glass.**

## Product Details:

- **VLam™** laminated Grade A safety glass helps to protect from injury caused by sharp splinters of broken glass. If broken, laminated glass sticks to the interlayer and generally stays in the window frame to provide added safety.
- **VTough™** toughened Grade A safety glass is up to five times stronger than annealed glass. On impact, it breaks into small blunt-edged pieces, reducing the risk of injury.
- **VLam™ Toughened** Grade A safety glass is the optimum in safety glass. Each piece of glass is toughened to provide superior structural strength when compared to annealed

glass and then these pieces are bonded together using a PVB interlayer to ensure if the glass breaks the pieces are held together by the interlayer.

- **DécorMirror Safe™** safety mirror glass is a high specification mirror with a special safety backing film to retain broken pieces of mirror if broken from impact.





PRODUCT

# VLam™

Laminated float glass – the first step in safety, security & noise control

**There's all kinds of specialist glass products out there, but sometimes you just want the best of everything. That's why we created VLam™ to be the starting point for safety, security, UV protection, noise reduction and – well, anything you want.**

**VLam™ offers everything you could need in a glass product for your space, as well as a range of custom options.**

**VLam™** consists of two or more sheets of glass bonded together by heat and pressure with an interlayer.

The result is a durable, adaptable high performance glazing material that can provide solutions to many architectural applications. The laminating process provides almost limitless options in glass configurations. Combinations of solar control glass, special interlayers, Low E and coated glass, as well as decorative glass provide tailored solutions. Toughened laminated glass is also available for large overhead spans and additional safety in balustrades. Glass options for floors are also available.



**The result is a durable, adaptable high performance glazing material that can provide solutions to many architectural applications.**

**Viridian can offer products that are outside of our standard VLam™ range, including bespoke custom laminated products. See page 114 for details.**

## Features and Benefits

**Safety** – laminated glass can resist penetration from accidental impact. If the glass is broken, fragments adhere to the interlayer and are retained in place. **VLam™** provides safety from contact with broken or falling glass, or bodily injury by falling through the glass. In certain applications, toughened laminated glass must be used, such as sloped overhead glass.

**Security** – standard laminated glass provides resistance to penetration from physical attack. By increasing the thickness of the interlayer and its strength, as well as using multiple glass interlayer constructions, products are offered for specialist security applications including bullet resistance (refer to our security glass category).

**Noise control** – **VLam™** provides good noise dampening over the same thickness of float glass. By incorporating **VLam™** into a **ThermoTech™** insulating glass unit, improved noise attenuation can be achieved. For noise reduction, you can use **VLam™ Hush** and its specially developed interlayer.

**UV protection** – the interlayer used in **VLam™** eliminates 99% of ultraviolet radiation. When incorporated with solar control glass, fading can be reduced up to 8.5 times over normal glass.

**Solar control** – **VLam™** can be manufactured with toned solar control glass and interlayers providing glare and solar heat gain reductions. Further to this, **VLam™** can be customised with virtually any Viridian solar control glass for the ideal balance between daylight solar control and thermal insulation.

**Colour and decoration** – translucent and translucent grey interlayers, along with textured glass options are available for privacy and light diffusion. Colour options are also available with our **DécorColour™** range.





How to Specify

- **Select glass name**  
VLam™
- **Select thickness – process**  
6.38mm to 39.52mm – Laminated  
7.52mm to 39.52mm – Toughened  
Laminate

**Select colour**  
Refer to range chart



VLam™, if broken the glass is bonded to an interlayer.

Considerations

- Glass selection, glazing and manufacturing must be in accordance with Australian Standards.
- Interlayer colours are based on but are not identical to 6mm VFloat™ glass tones.
- The glazing system must allow for water drainage or be completely watertight.
- Certain sealants may cause edge de-lamination such as linseed oil or putty – neutral cure silicone sealants are recommended.
- Viridian does not warrant laminated glass with edges left exposed.

Product Range

VLam™ Range					
Product	Thickness (mm)				
	6.38	6.76	8.38	10.38	12.38
Clear	◆		◆	◆	◆
Bronze	◆		◆	◆	◆
Green	◆		◆	◆	◆
Grey	◆		◆	◆	◆
SuperGreen™	◆			◆	◆
Translucent	◆		◆	◆	◆
Translucent SuperClear™				◆	◆
Translucent Grey		◆			

Viridian has a range of laminate products which provide different types of end benefits to your project. **VLam™** is the starting point, see below for products which take your performance to the next level.

Noise

- VLam™ Hush
- ComfortHush™

Decorative

- DécorColour™
- VLam™ Translucent, VLam™ Translucent Grey

Solar Control

- VLam™ Grey, Bronze, Green, SuperGreen™
- ComfortPlus™

Security

- DécorMirror™ Oneway
- IntruderGuard™
- AssaultGuard™
- AssaultGuard™ Ultra
- JailGuard™

Special applications

- BulletGuard™
- Bespoke Custom Laminated Products

Applications

- Balustrades
- Facades
- Facade Cladding
- Furniture
- Partitions
- Shower Screens
- Windows
- Doors
- Overhead Glazing

VLam™ is a trademark of Viridian Glass





## PRODUCT

# VTough™

Quality toughened glass – for superior strength, safety & resilience

**Why settle for ordinary glass when there's a tougher option available? VTough™ offers a total glass solution that allows greater scope in your design.**

**Five times stronger than ordinary glass, VTough™ is perfectly suited to a wide range of applications that would normally put ordinary glass at risk of breaking. This includes splashbacks, basketball backboards and lots more. Think of the possibilities!**

Whenever the benefits of ordinary glass need to be combined with extra strength, safety or heat resistance, VTough™ toughened glass offers a complete and proven solution, allowing designers and specifiers greater scope with glass for building.

VTough™ toughened glass is a Grade A safety glass manufactured to AS/NZS2208 for use in buildings or AS/NZS2080 safety glass for land vehicles. It is manufactured by heating and then rapidly cooling float glass. As a result, opposing compressive and tensile stresses are set up in the glass, which gives toughened glass four to five times more strength than ordinary glass of the same thickness, combined with much greater resistance to impact. In the unlikely event of breakage, VTough™ fragments into small blunt-edged pieces, reducing the risk of injury. VTough™ toughened glass cannot be cut or edgework processed after manufacture.

Virtually all glass types can be supplied in toughened form, the exceptions being some deeply patterned glass, mirrors, wired and glass for leadlighting.

## Considerations

- **Heat soak treatment.** In accordance with the NCC (2016), heat soak testing on toughened glass will be mandatory in certain applications.
- **Tolerances** – as listed in AS/NZS2208, toughened glass is inherently less flat than ordinary glass.
- **Wind load** – toughened glass can be used in larger areas than ordinary glass of the same thickness. This allows a consistent thickness and appearance to be achieved in areas of higher wind load or panel dimensions. Deflection should be checked.
- **Selection and glazing** – glass must be selected and installed in accordance with Australian Standard AS1288. Attention is also drawn to the breakage characteristic of toughened glass and it is the specifier's responsibility to assess suitability for each application.
- **Heat strengthened glass** – this is not a safety glass, but has approximately double the strength of ordinary glass. It is resistant to thermal breakage (temperature differential of 160°C) and if broken, breaks into larger pieces. This glass may have less distortion than fully toughened glass and is used where additional strength without safety is required.

✓ **VTough™ toughened glass offers a complete and proven solution, allowing designers and specifiers greater scope with glass for building.**

## Features and Benefits

- **Strength** – toughened glass allows large, clear spans with minimum fixing. Toughened glass is used with bolt or patch fittings for frameless doors and assemblies, or glass shapes, including holes, that may weaken normal annealed glass. Toughened glass has good resistance to soft body impacts.
- **Thermal resistance** – resists temperature differences of 250°C in a range of -70°C to +300°C. This means that toughened glass can be used in splashbacks and where thermal stress breakage is an issue.
- **VTough™** can be laminated for additional safety, solar control or appearance.
- Wide range of glass types available.
- Manufactured and distributed throughout Australia for ease of availability.

## Applications

- Splashbacks
- Shower Screens
- Partitions
- Spandrels
- Facades
- Wall Cladding
- Furniture
- Balustrades
- Windows
- Doors

## Thickness

- 4mm to 19mm

## How to Specify

- **Select glass name**  
VTough™
- **Select thickness – process**  
4mm to 19mm – Toughened  
4mm to 12mm – Heat Strengthened  
9.52mm to 39.52mm – Toughened/  
Laminate
- **Select colour**  
From VFloat™ range



VTough™ is a trademark of Viridian Glass



PRODUCT

# SuperClear™

High clarity glass – for crystal clear & colour-true views

**Whether you want flawless colour for a glass feature, or simply the clearest view of outside, SuperClear™ will deliver you the very best look.**

**SuperClear™ eliminates the subtle green tint that usually comes with glass, and offers an almost invisible barrier between you and the world.**

**SuperClear™** brings maximum transparency and clarity by providing a crystal-clear glass unlike the green tint usually found in standard float glass. This is achieved by using silica sand with a low iron content during glass making to reduce the otherwise characteristic green of standard float glass. When painted, **SuperClear™** represents colours, in particular light colours, much more accurately than standard float glass.

The result is readily apparent with thick glass where the edges remain clear and colour transmittance is more accurately processed.

**SuperClear™** is available in laminated, toughened and toughened laminated form. It is particularly useful when glass has an applied design or colour such as **PixaGraphic™** and **Seraphic™** where light colours remain true.

**SuperClear™** can be used to stunning effect in balustrade systems, frameless shower screens and furniture where a processed glass edge is exposed and clarity of vision is desired. The sheer beauty of this product opens up a raft of new possibilities for architects and designers.

The following table shows the light and solar transmission performance for **SuperClear™** and standard float glass.

## ✓ Comparison of light and solar transmission

Glass Thickness	Light Transmission %		SHGC	
	VFloat™ Clear	VFloat™ SuperClear™	VFloat™ Clear	VFloat™ SuperClear™
4mm	89	91	0.85	0.90
6mm	88	91	0.82	0.89
8mm	86	90	0.78	0.88
10mm	85	90	0.75	0.88
12mm	84	90	0.73	0.88
15mm	84	90	0.76	0.86
19mm	82	90	0.72	0.85

## ✓ SuperClear™ brings maximum transparency and clarity by providing a crystal-clear glass

### Features and Benefits

- High clarity, crystal clear, low iron glass for special applications.
- Purity and trueness of colour with minimum colour cast when viewing through the glass.
- Translates light coloured paint more accurately than standard float glass.
- Very high light transmission of 90% and over.
- Can be toughened and laminated.
- Maintains colour consistency over the range of glass thickness.
- Used in **Seraphic™** or **PixaGraphic™** and very thick products such as **DécorFloor™** to minimise natural green tone.

### Applications

- Shower screens
- Balustrades
- Furniture
- Partitions
- Windows
- Doors

### How to Specify

- **Select glass name**  
SuperClear™
- **Select thickness – process**  
4mm to 19mm – Annealed  
4mm to 19mm – Toughened  
4mm to 12mm – Heat Strengthened  
8.38mm to 31.52mm – Laminated  
9.52mm to 31.52mm – Toughened/  
Laminate





> VIRIDIAN GLASS GUIDE™

# Energy

Designed to provide year-round comfort & reduce your reliance on heating & cooling.

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**Products:**

SuperTones™  
SmartGlass™  
EnergyTech™  
SolTech™  
EVantage™  
ComfortPlus™  
ThermoTech™  
Viridian ClimaTech™  
LightBridge™  
LightBridge next™  
PerformaTech™  
VistaTech™



# Energy codes and glass

Reducing energy consumption in every aspect of our lives is high on the national agenda. Buildings in which we live and work consume significant amounts of energy with correlating greenhouse gas emissions. In response to this, the government has developed mandatory minimum Energy Efficiency Measures. These regulations cover both residential and commercial construction types.

Energy use modelling has shown that the selection and placement of glazing is one of the most critical elements in designing for energy efficiency. In large commercial and apartment buildings where the roof is a smaller proportion of the building envelope, treatment of glazing is the most important design consideration. Selecting the right glass allows designers to maximise light, while insulating against heat loss and selectively shielding unwanted heat gain. Choosing the right balance of these factors during the design phase will provide a comfortable, healthy and energy efficient environment for the life of the building.

The code is performance based, offering a number of paths to compliance and sets out the performance that a building has to achieve. In terms of glazing, the key focus is on minimising the rate of summertime heat gain and winter heat loss (the emphasis will shift depending on the climate zone). The requirements will also vary depending on the nature and type of heating and cooling systems employed, if any.

Glazing performance is measured in terms of U Value (for conduction) and solar heat gain coefficient (SHGC), and is based on Australian Fenestration Rating Council (AFRC100-2001) conditions. All Viridian glass performance data presented in this guide is assessed under AFRC 100-2001 environmental conditions. Care should be exercised when selecting performance data to ensure that it meets these criteria.

The code also allows for a dual approach to calculating glazing system performance – either by reference to published ‘window system’ (glass plus frame) data, or by aggregation of the glass performance data and a frame adjustment (for conductance). The performance data presented in this guide is for glass only.

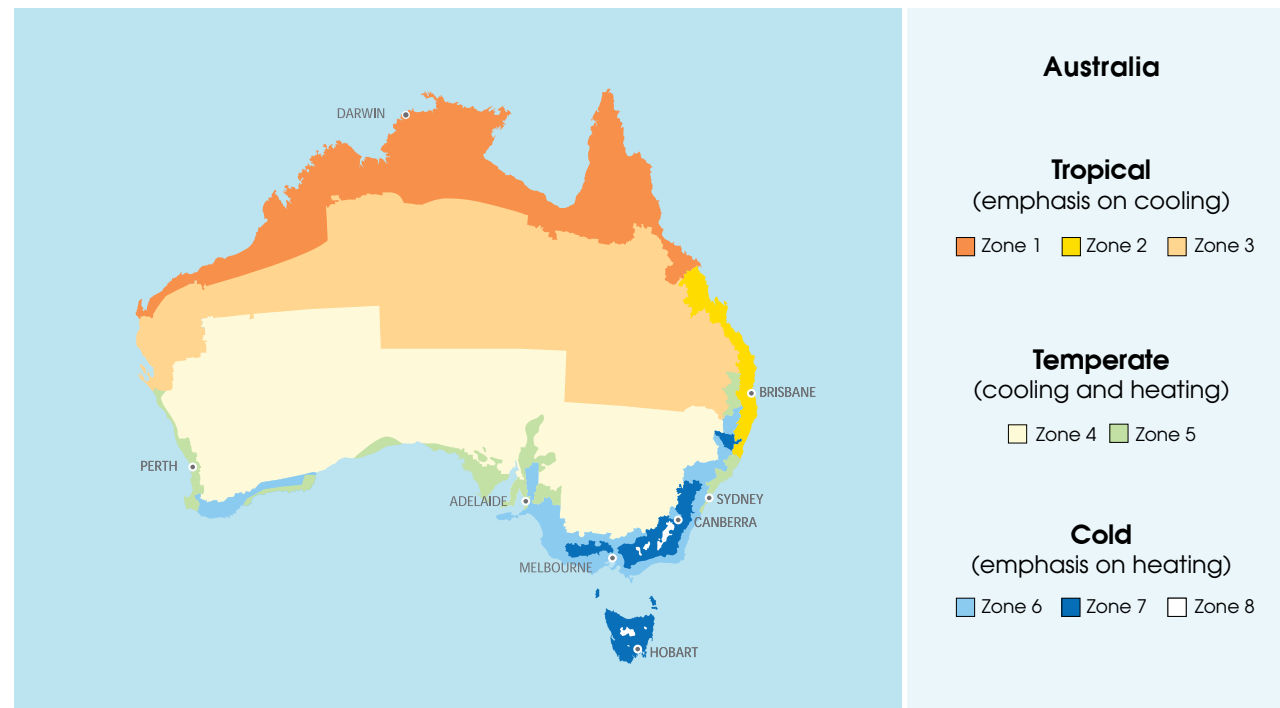
The deem to satisfy provisions of the code are aimed at allowing unlimited mixing of glazing sizes, glass and frame types. Glazing requirements in each climate zone are a function of floor area, conductance and solar radiation of the glazing system, orientation, shading devices and window area. The code recognises high performance glazing through maximising allowable window sizes.

✓ **Generally, southern locations will often require products with high performance thermal insulation (lower U Values), while in a northern location, solar radiation (lower SHGC value) will usually be the critical component.**

Generally, southern locations will often require products with high performance thermal insulation (lower U Values), while in a northern location, solar radiation (lower SHGC value) will usually be

the critical component. In the more temperate locations, a combination of U Value and or SHGC could be the critical component. Viridian offers a range of products that can meet these various requirements. A simple chart reference indicating the relative performance by product for daylight transmission, thermal insulation (conductance) and solar control is shown in the glass performance data tables.

## Climate Zones



The BCA energy efficiency requirements are evolving in stringency and application. The information on glazing requirements has been paraphrased from the ABCB publication.

The National Construction Code (NCC) is now on a three-year update cycle, the latest version of the NCC was released in February 2019 and came into effect in May 2019, except for Section J of the Code which came into effect in May 2020.

The Australian Building Codes Board (ABCB) has worked extensively with industry stakeholders to overhaul the NCC 2019 with the objective being to make it simpler and more flexible to read and use. A copy of the NCC is also freely available as a download from the ABCB website, further workbooks and supporting documents are also available.

The changes are fundamentally designed to encourage a broader use of ‘Performance Solutions’ methods rather than Deemed to Satisfy (DTS) provisions, one of biggest changes is the withdrawal of the current glazing calculator for use in glazing assessments. Glass, window frames and wall elements play an integral role in the energy efficiency and comfort of a building and these will now be combined and assessed together as a single element.

These changes, along with future increases around energy efficiency, aim to reduce Australia’s energy productivity by 40 per cent by 2030.

To better understand these changes please visit the ABCB website [www.abcb.gov.au](http://www.abcb.gov.au), look out for industry seminars or contact Viridian for further assistance.

The performance data for Viridian glass is derived using the International Glass database and software developed by Lawrence Berkley University. The international standard of measurement used is NFRC 100-2001 conditions. All relevant guidelines of the National Fenestration Council (NFRC) have now been changed to the Technical Protocols and Procedures Manual for the Energy Rating of Fenestration Products by the Australian Fenestration Rating Council (AFRC).

The combination of the SHGC and U Value determines the performance of the glass and its energy contribution. The building structure, glass framing system and orientation will all contribute to determining the overall environmental performance of the facade and the building. It should be noted that performance data presented in this guide is for glass only and a window rating or assessment is required.

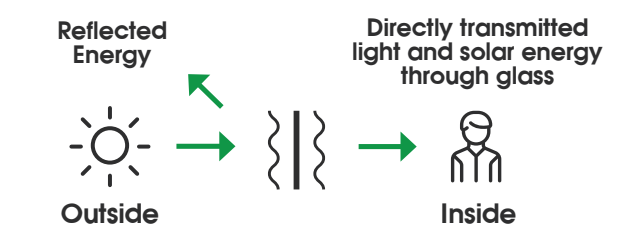
Not all manufacturers’ data is calculated using NFRC 100-2001 conditions, in particular some countries have different conditions that will impact on the glass performance.





# Glass and energy management

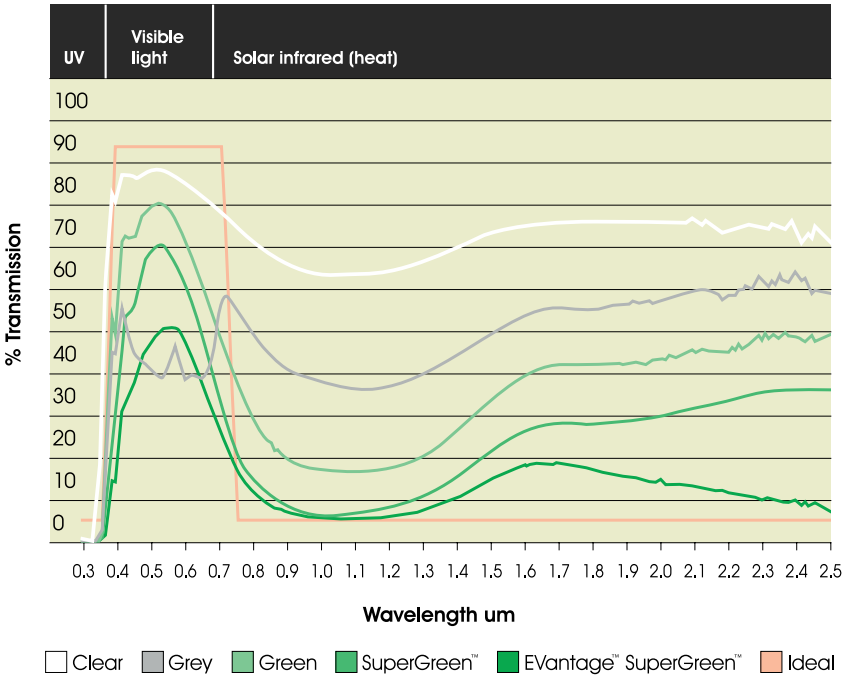
Glass controls solar heat gains through reflection and absorption – the sum of the direct solar heat transmitted and the absorbed heat that is re-radiated inside is the total heat transmitted or the SHGC.



The SHGC performance of the example above could be improved by adding a colour tone to the glass or by adding a Low E coating.

## The solar energy spectrum and glass

The role of Viridian solar control glass is to minimise infrared light that carries most of the sun's solar energy while maximising visible light. The ideal spectrally selective glass would transmit daylight and eliminate infrared and UV light. The chart below compares some current Viridian products to the theoretical ideal glass.



## How much daylight versus transparency?

For certain applications clear visibility is important, while for others glare control is necessary. The size of the glazed area determines the quantity of daylight, not just the glass daylight transmission percentage. In some cases very low light transmission glass is required.

- For shopfronts, transparency and clarity are paramount. High daylight transmission glass with low internal and external reflectivity should be specified.
- For commercial building facades, there is a trend to maximise transparency and daylight. High daylight transmission often results in work spaces that have too much glare. Very low transmission means more artificial lighting. Particular care needs to be taken with east and west elevations.
- For night time viewing, the greater the light transmission, the easier it is to see out. Highly reflective solar control coatings are not advised if night viewing is a priority.

- For large overhead expanses, glass with relatively low daylight transmission results in well balanced, naturally lit spaces. This is particularly so if a screen printed **Seraphic™ Design** is combined with a solar control glass.

# Solar control, thermal insulation and energy management

Energy management is a key decision in determining the performance and appearance of building facades. This section outlines the various attributes and performances of Viridian glass.

## Products have been grouped by their key application:

- Solar control
- Solar control with Low E
- Thermal insulation

## Terminology

To describe the performance of glass, it is important to understand the following attributes.

- Visible light transmittance** – the percentage of visible light transmitted through the glass. The higher the number, the more light. It does not determine the colour of the glass.
- SHGC (solar heat gain coefficient)** – the proportion of directly transmitted and absorbed solar energy that enters into the building's interior. The lower the number, the better solar control. For example, if the direct solar energy on a hot day is 785 watts/m2 and **SuperGreen™** was used with a SHGC of 0.51, then the solar energy reaching indoors is  $785 \times 0.51 = 400$  watts. Approximately half of the sun's heat is eliminated.
- U Value** – this is the measurement of air-to-air thermal conductance, or insulation between indoors and outdoors, through the glass. The lower the number, the better the insulation. For example, clear glass has a U Value of 5.8 W/m2 °C. If the indoor temperature was 24°C and the external temperature 34°C (a difference of 10°C) then 10°C multiplied

by the U Value 5.8 equals 58 watts/m2 of heat that would be transferred between the exterior and interior.

- Selectivity** – Glass selectivity is an index that reports the relationship between visible light transmission and solar heat gain, it is measured as an index ( $S = Vt/g$ ) with a high selectivity more preferable in modern building design. High selective glasses, generally above 1.8 offer exceptional performance which provides some of the best energy savings through the lowest conductance (U Values) and best solar control (SHGC), high visible light transmission assists in the requirement for less artificial lighting during daylight hours.
- What is Low-Emissivity?** – Emissivity measures the rate a product emits absorbed heat. The lower the number, the more efficiently the glass reduces heat gain or heat loss, which means a lower U Value and better insulation. For comparison, normal glass has an emissivity of 0.84 and **EnergyTech™** and **SolTech™** is 0.17, which means only 17% of heat absorbed is re-emitted. Likewise, if a solar control glass is used, it acts as a barrier to the absorbed heat in the glass, passing to inside the building. For buildings that require passive heat gains, it allows direct solar radiation to pass through the glass and then traps it inside. So in combination with the right selection of solar control glass or thermal insulating glass, energy use will reduce in cost.
- Low E glass** – These glasses enhance insulation, and provide additional solar control when combined with a solar control glass, in either a single glass, a laminate, and/or an insulating glass unit.



Low E glass has either a pyrolytic or sputter coating that reduces the emissivity of the glass surface. This means the glass provides greater insulation by reflecting heat. For improved solar control it is also a second line of defence. Heat absorbed by the solar control glass is reflected back out by the Low-Emissivity coating to provide even better solar control. Low E coatings are useful for reducing solar heat gains and also heat loss.

Performance Comparison

To assist in comparing products, Viridian has developed a chart per product or range that shows the key performance selection criteria: VLT, U Value and SHGC (chart below).

Product*	VLT	U Value	SHGC
VFloat™ Clear	88	5.8	0.82
EVantage™ SuperGreen™	49	3.8	0.38

\*6mm glass thickness

This example shows a comparison between **VFloat™** Clear and **EVantage™** SuperGreen™. The full performance data of all products is shown in the performance data table at the back of this guide.

Solar control products

Solar control – Products that mediate solar heat gain

- **VFloat™**
- **SuperTones™**

Solar control with Low E – Products that provide high solar control, with the added insulation of a Low E coating

- **SmartGlass™**
- **EnergyTech™**
- **SolTech™**
- **EVantage™**
- **ComfortPlus™**
- **ComfortHush™**

Thermal insulation – Insulating glass units for cold and hot conditions

- **ThermoTech™**
- **Viridian ClimaTech™**
- **LightBridge™**
- **LightBridge next™**
- **PerformaTech™**

Thermal breakage

Thermal breakage refers to annealed glass cracking due to a build up of excessive thermal stress from a differential in temperature gradient across the glass. Viridian recommends that a thermal stress analysis be undertaken for all solar control glazing.

✓ **Viridian recommends that a thermal stress analysis be undertaken for all solar control glazing.**

This is a free service for all trading Viridian customers only. If a glass is unsafe then it will require heat strengthening or toughening. Normal annealed float glass

can resist a temperature differential of 40°C; **DécorPattern™** glass 30°C; heat strengthened glass 180°C and toughened glass 250°C.

There are many factors that affect thermal stress, the higher the solar absorption of the glass, the more risk. Factors such as shading from frame depth or shading devices, the type and colour of the frame, whether or not there is a back up wall or blinds, the colour of the blinds or wall, the distance of the blinds or wall to the glass and whether or not the gap is ventilated, all affect stress. Modification of any of these factors will impact on the thermal breakage of the glass.

# High Performance Spacer

Aluminium is used as the standard spacer option across our range of double glazed units. However, in our **LightBridge next™** range we offer a thermally optimized hybrid warm edge spacer as standard, and we also now offer the thermally optimized hybrid warm edge spacer as an optional extra for all other IGU's in the Viridian Glass range.

Key benefits:

Seamless Look

The matte black finish creates a seamless look inside the double glazed unit. A clean look, where the glass unit blends seamlessly into the window frame.

Sustainability

Our Thermally Optimised Warm Edge Spacer technology is made from sustainable materials.



Better Thermal Quality

This technology creates a better and more durable thermal seal around the double glazed unit, thus reducing moisture penetrating into the space and also preventing filling gases from escaping. This may reduce instance of condensation and create a more efficient thermal barrier when used as part of a high-performance window system.

The thermally optimized hybrid warm edge spacer adds another opportunity for window manufacturers, architects, builders, and homeowners to implement another level of thermal performance to their window systems, creating a more complete level of thermal efficiency to your projects.

Viridian's high performance spacer is proudly supplied by Technoform.





PRODUCT:

# SuperTones™

High performance toned glass - for maximum glare and solar heat control

Our SuperTones™ range offers a cost-effective option for when you want to open up your space to natural light and views, without sacrificing on energy efficiency.

All three colour options in the range offer great solar control, reducing your reliance on heating and cooling – saving you on energy bills. Meanwhile, the sharp optical clarity allows you to enjoy natural light and the view around you.

SuperTones™ glass provide significant improvements in solar performance compared to VFloat™ and VLam™ toned glass. The colours are deeper, however natural views from the interior are maintained with low exterior reflectance. They can be processed and fabricated similarly to normal float glass to provide an economical choice for reducing air-conditioning costs.

**SuperGreen™** provides a deep green, crisp appearance with sharp clean external views and low external reflectance. Designed to provide very high daylight transmission (66%) with solar control (SHGC of 0.51). It offers 20% better solar performance than conventional tones, with reduced glare and UV.

**SuperGrey™** provides the highest solar control of any uncoated float glass, with solar control (SHGC of 0.35). Its dark grey colour provides privacy from the outside and reduced see-through. The glass reduces glare with 9% light transmittance making it appropriate for use in skylights.

**SuperBlue™** has a unique blue colour that is cool and distinctive. It provides solar control similar to that of **SuperGreen™**, again with high daylight transmission.

## Considerations

The high performance toned glass range absorbs a large proportion of solar radiation. Applications must be checked for thermal stress breakage. We recommend that VFloat™ SuperGrey™ be specified and supplied as a heat strengthened or toughened glass in all situations.

## Features and Benefits

- Solar control float glass – low cost glass without coatings that optimises light transmission and reduces cooling loads.
- Low external and internal reflectance.
- **SuperGreen™** and **SuperBlue™** provides good daylight transmission.
- Low UV transmittance – outperforms other tinted products for reduced fading. **SuperGrey™** eliminates 99% of UV radiation.
- Can be combined with Low E glass in insulating glass units for enhanced performance.

## Applications

- Facades
- Windows
- Overhead Glazing

## How to Specify

- **Select glass name**  
VFloat™, VLam™, EnergyTech™, EVantage™, ThermoTech™ or ThermoTech™ E
- **Select thickness - process**  
6mm to 10mm – Annealed  
6mm to 10mm – Toughened  
6mm to 10mm – Heat Strengthened  
11.52mm to 21.52mm – Toughened/Laminate
- **Select colour**  
Refer to chart below

## Performance Comparison

Product*	VLT	U Value	SHGC
SuperGreen™	67	5.8	0.53
SuperGrey™	9	5.8	0.36
SuperBlue™	53	5.8	0.52

\*6mm glass thickness

## Product Range

Product	Thickness (mm)	
	6	10
SuperGreen™	◆	
SuperGrey™	◆	
SuperBlue™	◆	◆

SuperTones™ is a trademark of Viridian Glass



PRODUCT

# SmartGlass™

Insulated single-glazing – where superior comfort & natural light begins for your home

We know how expensive it can be to keep a family home cool in summer and warm in winter. SmartGlass™ is energy efficient glass designed for the harsh Australian climate.

SmartGlass™ works like the insulation in your walls and ceiling, protecting you from the summer heat and winter chill. But SmartGlass™ doesn't only help you enjoy the view in comfort – it's also available in a range of enhanced security, noise reduction and UV protection options, for a home which offers greater amenity and peace of mind.

SmartGlass™ is a range of single glazed toughenable Low E products offering insulation and a choice of solar protection, with low reflectivity ideally suited to the demands of Australian residential applications. SmartGlass™ provides excellent performance and versatility for single glazed windows.

SmartGlass™ has been selected for Australian climate conditions to assist in achieving energy Star Ratings for home designs, whilst still capturing natural light and views. Manufactured using hardcoat Low E coating for excellent durability and ease of processing and handling.

## Features and Benefits

- Low E insulation with a choice of solar protection performance for residential applications.
- Provides a straight forward energy efficient alternative to ordinary glass.
- Durable pyrolytic Low E coating ideal for single glazing.
- Low reflectivity.
- Once toughened or laminated to the relevant standard SmartGlass™ is a Grade A safety glass (AS/NZ2208).
- Suitable for most standard single glazed window frames.
- Glass must be installed with Viridian product label facing to the exterior.

## Applications

- Residential Windows
  - Residential Doors
- (Residential application only)

## How to Specify

- **Select glass name**  
SmartGlass™
- **Select thickness - process**  
4mm or 6mm – Annealed  
4mm or 6mm – Toughened
- **Select colour**  
Refer to product range chart

## Product range

Product	Thickness (mm)	
	4	6
SP10 Clear	◆	◆
SP30 Neutral	◆	◆
SP35 Grey	◆	◆



As you can see in this actual thermal image, SmartGlass™ reflects heat back into the room, helping keep occupants warm when it's cold outside. Compare this to the ordinary glass window, where heat freely escapes to the outside.

## Performance Data

Product	Visible trans. %	Visible reflect. % (external)	Visible reflect. % (internal)	Solar trans. %	Solar reflect. %	UV trans. %	U Value (W/m²C)	SHGC
4mm SmartGlass™								
SP10 Clear	83	11	11	68	11	54	3.7	0.72
SP30 Neutral	61	8	10	46	8	44	3.7	0.54
SP35 Grey	50	7	9	45	7	21	3.7	0.54
6mm SmartGlass™								
SP10 Clear	81	11	12	65	10	48	3.6	0.70
SP30 Neutral	63	9	10	45	8	41	3.7	0.54
SP35 Grey	40	6	9	37	7	16	3.7	0.48





## PRODUCT

# EnergyTech™

Insulating glass – the first step in greater thermal control

If you want to bathe your space in natural light but still control the temperature within – then look no further than EnergyTech™.

Specifically designed for Australian conditions, EnergyTech™'s enhanced solar control keeps buildings cooler in summer and warmer in winter. So you can open your space to natural light without compromising on comfort.

The comprehensive range of EnergyTech™ Low E products offer improved thermal insulation and a choice of solar control performance with low visible light reflection.

Viridian understands our climate is unlike that of Northern Europe or the United States. That's why we offer a comprehensive choice of Solar Control Low E products to help reduce the extremes of Australia's warmer weather, balanced with opportunities for passive solar heating.

Using the durable pyrolytic hard coat technology enables the durable Low E coating to be single glazed and exposed to the interior of a building to provide improved thermal insulation. The product can also be used as part of a laminated glass or in an insulated glass unit.

## The EnergyTech™ Range

EnergyTech™ Low E products offer improved thermal insulation (U Value) to help keep a building warmer in winter and reduced solar heat gain (SHGC) to help keep your building cooler in summer with a choice of solar control performance levels. The range is designed specifically for the Australian climate regions and to help meet energy requirements.

This product complements the ComfortPlus™ range, it can also be used as part of a bespoke laminated glass solution or as part of an insulated glass unit.

## Considerations

Please note the presence of haze may be perceived under certain light conditions (Refer to our website for more information). When single glazed, these products are not designed to prevent surface condensation and their insulating capacity is reduced should this occur. **ThermoTech™** Insulating Glass Units are recommended in these situations. When used in a single glazed application, the coating needs to be exposed to the interior of the building.

Glass must be installed with Viridian product label facing to the exterior.

✓ **Key consideration during design is to comply with the energy codes while still maximising visible light transmission (VLT).**

## How to Specify

- **Select glass name**  
EnergyTech™
- **Select thickness - process**  
Annealed, toughened, heat strengthened
- **Select colour**  
Refer to product range below

## Features and Benefits

- Durable Low E hard coating bonded to the glass for enhanced thermal insulation by lowering the U Value of the glass.
- A broad range of solar control performance to choose for Australian conditions.
- Low visible light reflectivity to provide good transparency.
- Can be toughened, laminated, curved or used in an insulated glass unit.
- Does not require edge deletion for use in insulated glass units.
- Once toughened or laminated to the relevant standard **EnergyTech™** is a Grade A safety glass (AS/NZ2208).

## Applications

- Windows
- Doors
- Overhead Glazing
- Facades

## ✓ Product Range

EnergyTech™	Thickness (mm)					
	4	5	6	8	10	12
Clear	◆	◆	◆	◆	◆	◆
Light Grey			◆			
Grey	◆		◆			
SuperGreen™			◆			

## ✓ Performance Comparison

EnergyTech™	Single Glazing			Insulated Glass Units		
	VLT	U Value	SHGC	VLT	U Value	SHGC
Clear	81	3.6	0.70	73	1.6	0.62
Light Grey	57	3.7	0.54	51	1.7	0.45
Grey	40	3.7	0.48	35	1.7	0.39
SuperGreen™	61	3.7	0.41	54	1.6	0.32

\*6mm glass thickness





## PRODUCT

# SolTech™

Insulating glass – for a comfortable building with enhanced insulation

**SolTech™ provides better insulation and enhanced solar control levels to keep your space comfortable across all seasons by keeping the temperature of your room controlled, lowering your energy consumption and reducing the need for additional heating and cooling.**

The **SolTech™** range features a pyrolytic Low Emissivity coating that is fused at extremely high temperature when the glass is being made, producing a durable hard transparent coating on one surface of the glass. Unlike ordinary float glass, the Low E coating provides better insulation and enhanced solar control to help keep a building warmer in winter and cooler in summer.

Available in neutral and grey tones, **SolTech™** provides good daylighting performance whilst

improving the thermal insulation and reducing the solar heat gain. The products can also be used as part of a laminated glass or in an insulated glass unit for enhanced performance.

## The SolTech™ Range

**SolTech™** Low E products offer improved thermal insulation (U Value) to help keep a building warmer in winter and reduced solar heat gain (SHGC) to help keep your building cooler in summer with a choice of solar control performances levels. The range is designed specifically for the Australian climate regions and to help meet energy requirements.

## Considerations

Please note the presence of haze may be perceived under certain light conditions (refer to our website for more information). When single glazed, these products are not designed to prevent surface condensation and their insulating capacity is reduced should this occur. **ThermoTech™** Insulating Glass Units are recommended in these situations. When used in a single glazed application, the coating needs to be exposed to the interior of building.

Glass must be installed with Viridian product label facing to the exterior.

## Features and Benefits

- Low E coating provides enhanced thermal insulation by lowering the U Value of the glass.
- Provides a choice of good visible day lighting to reduce the need for interior lighting.
- Low visible light reflectivity to provide good transparency.
- Can be toughened, laminated, curved or used in an insulated glass unit.
- Does not require edge deletion for use in insulated glass units.
- Once toughened or laminated to the relevant standard **SolTech™** is a Grade A safety glass (AS/NZ2208).

## Performance Comparison

SolTech™	Single Glazing			Insulated Glass Units		
	VLT	U Value	SHGC	VLT	U Value	SHGC
Neutral	63	3.7	0.54	56	1.6	0.45
Grey	30	3.7	0.37	27	1.6	0.28

\*6mm glass thickness

## Applications

- Windows
- Doors
- Overhead Glazing
- Facades

## How to Specify

- **Select glass name**  
SolTech™
- **Select thickness and process**  
Annealed, toughened, heat strengthened
- **Select colour**  
Refer to product range below

## Product Range

SolTech™	Thickness (mm)		
	4	6	10
Neutral	◆	◆	◆
Grey		◆	





## PRODUCT

# EVantage™

Reflective insulating glass – for thermal control with heat & glare reduction

If you want a comfortable and private space, EVantage™ can deliver just that – and all for a price tag you can afford.

The reflective coating of EVantage™ delivers greater solar control, keeping your space cooler in summer and warmer in winter.

EVantage™ is a single glass using a Low E coating that provides thermal and solar control enhancement. EVantage™ is an economical option for project requiring better performance than standard glass. EVantage™ offers improved thermal insulation (U Value) to help keep a building warmer in winter and reduced solar heat gain (SHGC) to help keep your building cooler in summer with a choice of solar control

performances levels. The range is designed specifically for the Australian climate regions and to help meet energy requirements.

EVantage™ is manufactured by the pyrolytic Low E coating process. In this online chemical vapour deposition process, a gas reacts with the semi molten surface of the float glass to form a reflective coating on Clear or Toned substrates. The result is a product that combines solar and thermal performance, subtle reflectivity and glare control. The base colour of the glass whether Clear, Grey, Bronze, BlueGreen SuperGreen™ or SuperBlue™ is maintained with a significant boost to solar and thermal characteristics through the proprietary of the Low E coating.

EVantage™ can also be used as part of a laminated glass or in an a ThermoTech™ insulated glazed unit for even better performance.

## Considerations

The EVantage™ Low E coating provides thermal and solar control enhancements. The placement of air-conditioning vents adjacent to and directed on the internal glass surface coating, may reduce the performance of EVantage™ when used in a single glazed applications.

Glass must be installed with Viridian product label facing to the exterior.

## Features and Benefits

- Good solar control.
- Good light transmission.
- Reduce UV transmittance.
- Reduce Glare.
- Can be cut and processed or combined into a double glazed unit (ThermoTech™) for enhanced performance.
- Neutral light transmittance maintains toned glass colour and clarity.
- 10 year Warranty from date of manufacture.

## Applications

- Windows
- Doors
- Overhead Glazing
- Facades

## How to Specify

- **Select glass name**  
EVantage™
- **Select thickness and process**  
6mm – Annealed  
6mm – Toughened  
6mm – Heat Strengthened  
11.52mm to 17.52mm – Toughened/  
Laminate
- **Select colour**  
Refer to performance chart below

## ✓ Performance Comparison

EVantage™	VLT	U Value	SHGC
Clear	68	3.8	0.63
Bronze	38	3.8	0.46
Grey	32	3.8	0.42
SuperGreen™	49	3.8	0.38
SuperBlue™	39	3.8	0.37
BlueGreen	56	3.8	0.46

\*6mm glass thickness





## PRODUCT

# ComfortPlus™

Laminated insulating glass in a range of tones – creating a sanctuary from the elements

Whatever the weather outside, you should be able to enjoy the view without feeling the summer heat or winter chill.

The **ComfortPlus™** range of laminated glass has been developed to meet objectives of transparency and high performance solar control with low reflection. It incorporates a solar control component that in summer reduces the sun's heating, glare and UV fading of interior furnishings. In winter, the **ComfortPlus™** coating

provides thermal insulation and reduces heat loss through the glass by 40% when compared to standard glass, without heavy tinting or reflective mirror-like coatings that reduce natural light.

Where acoustic comfort is required consider **ComfortHush™**. Our **ComfortHush™** range contains a Low E coating as well as a specially formulated acoustic interlayer.

Glass must be installed with Viridian product label facing to the exterior.

## Features and Benefits

- **ComfortPlus™** is available in Clear, Neutral, Bronze, Grey, Light Grey, Green or Translucent.
- Summer and winter performance through the unique combination of solar control glass and coating.
- High daylight transmission up to 76%.
- Solar control – up to 70% of solar heat transmission is eliminated.
- Thermal insulation – a 40% improvement in U Value over standard glass means less heat is transmitted.
- Reduces UV radiation by 99% reducing fading up to 8.5 times over normal glass.
- **ComfortPlus™** is a laminated Grade A safety glass (AS/NZ2208).
- The interlayer in **ComfortPlus™** reduces voice noise by 13% and traffic noise by 24% when compared to standard 3mm glass.
- Thicker interlayers are available for increased resistance to physical attack.
- **ComfortPlus™** Translucent addresses the concerns for privacy of homeowners, providing a solution for overlooking.

## Applications

- Windows
- Doors
- Facades
- Overhead Glazing

## How to Specify

- **Select glass name**  
ComfortPlus™
- **Select thickness - process**  
6.38mm to 12.38mm – Laminated  
9.52mm to 21.52mm – Toughened/Laminate
- **Select colour**  
Refer to product range chart below

## ✓ Performance Comparison

ComfortPlus™	VLT	U Value	SHGC
Clear	82	3.6	0.69
Green	71	3.6	0.51
Neutral	59	3.6	0.52
Light Grey	54	3.6	0.56
Bronze	49	3.6	0.53
Grey	39	3.6	0.50
Translucent	63	3.6	0.59

\*6.38mm glass thickness

## ✓ Product Range

ComfortPlus™	Thickness (mm)			
	6.38	8.38	10.38	12.38
Clear	◆	◆	◆	◆
Green	◆		◆	
Neutral	◆	◆	◆	◆
Light Grey	◆		◆	
Bronze	◆		◆	
Grey	◆	◆	◆	◆
Translucent	◆		◆	

\*Note: Colour variation may be apparent in differing thicknesses. Thermal assessment may be required for ComfortPlus™





## PRODUCT

# ThermoTech™

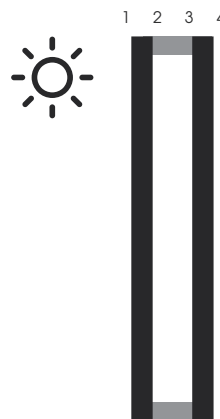
Double glazing – for enhanced comfort and design flexibility

Today's building regulations call for adhering to strict energy efficiency requirements. But this doesn't need to restrict the comfort of your space. The ThermoTech™ range offers plenty of glass combinations and spacer options within double glazed units – helping you create the perfect product to keep your space comfortable and energy efficient.

Suitable for hot and cold climates, products in the ThermoTech™ range are capable of keeping your space naturally lit without increasing your energy consumption or power bills.

ThermoTech™ is a range of sealed double glazed units that offers improved insulation.

ThermoTech™ uses 2 pieces of ordinary or laminated glass separated by a spacer and sealed together. ThermoTech™ will integrate products such as VFloat™, VLam™, SuperTones™, VLam™ Hush or DécorColour™ in the unit.



## Considerations

- Glazing compounds, sealants and gaskets need to be approved by Viridian for suitability.
- Frame design – the Viridian Warranty relies on frame design in accordance with AS/4666. Do not expose ThermoTech™ edges to standing water and moisture as this can result in seal failure. The frames must incorporate impervious weather seals or an efficient self-draining system.
- Wind load and safety determine the type and thickness of glass required – refer Australian Standard AS1288 or New Zealand Standard NZS4223.
- Refer to the Viridian website for specification and installation information, including distortion and reflection from changes in exterior and interior pressure and temperature.
- Special handling is required. When transporting and installing at altitudes of 800m and above, special requirements apply. This must be brought to the attention of Viridian.
- Units must be installed with Viridian product label facing to the exterior.

## Features and Benefits

- Increased insulation and reduced energy cost.
- Suitable for hot and cold climates.
- Can be incorporated with a Low E coated product for additional insulation.
- Reduced condensation.
- Argon gas as standard.
- Available with aluminium spacer as standard, this product can be supplied with a warm edge thermal spacer at additional cost.

## Applications

- Windows
- Facades
- Overhead glazing
- Curtain wall
- Spandrels

## Maximum Size

- Maximum Size: 4900mm x 2600mm\*  
\*subject to glass type and material thickness

## How to Specify

- **Select glass name**  
ThermoTech™
- **Select product make-up**  
Refer to performance comparison table for glass options e.g. 6mm VFloat™ Clear + 12 + 6mm Clear
- **Select colour**  
Subject to product make-up – Refer to performance comparison table
- **Select spacer type**  
Aluminium spacer supplied as standard

## ✓ Performance Comparison

ThermoTech™ make-up	VLT	U Value	SHGC
6mm Clear + 12mm Argon + 6mm Clear	78	2.5	0.71
6mm Grey + 12mm Argon + 6mm Clear	37	2.5	0.45
6mm SuperGreen™ + 12mm Argon + 6mm Clear	59	2.5	0.40

ThermoTech™ is a trademark of Viridian Glass





## PRODUCT

# Viridian ClimaTech™

## Entry level performance double glazing – for added comfort.

Viridian ClimaTech™ offers quality entry level double glazing for spaces which require additional insulation.

The built environment is demanding more thermally efficient building envelopes, and it is becoming more challenging to achieve local regulations with standard single glazing.

Suitable for hot and cold climates, Viridian ClimaTech™ provides increased thermal performance in residential and commercial window applications.

Viridian ClimaTech™ is a limited range of clear or toned double glazed units for applications which require a better performing window glass.

Viridian ClimaTech™ uses two pieces of glass, one coated with a spectrally controlled Low E coating and the other an ordinary clear or toned glass. Viridian ClimaTech™ is supplied in either heat strengthened or toughened only glass, which is separated by an aluminium spacer and sealed together using argon gas.

The product is available in 4mm, 5mm or 6mm clear options, and 6mm additional toned options for ease of choice and selection.

## Considerations

- Glazing compounds, sealants and gaskets need to be approved by Viridian for suitability.
- Frame design – the Viridian Warranty relies on frame design in accordance with AS/4666.
- Do not expose Viridian ClimaTech™ edges to standing water and moisture as this can result in seal failure. The frames must incorporate impervious weather seals or an efficient self-draining system.
- Wind load and safety determine the type and thickness of glass required – refer Australian Standard AS1288 or New Zealand Standard NZS4223.
- Special handling is required. When transporting and installing at altitudes of 800m and above, special requirements apply. This must be brought to the attention of Viridian.
- For higher thermal performance, and other additional benefits like acoustic or privacy consider upgrading to the PerformaTech™ or LightBridge next™ products.
- Thermal assessment may be required for lower SHGC variants.
- Units must be installed with Viridian product label facing to the exterior.

## Features and Benefits

- Increased insulation and reduced energy cost.
- Suitable for hot and cold climates.
- Argon gas as standard.
- Covered by Viridian Glass Warranty.
- Available with aluminium spacer as standard, this product can be supplied with a warm edge thermal spacer at additional cost.
- Can be ordered with DécorSatin™ or DécorPattern™ for privacy requirements.

## Applications

- Commercial and Residential Windows and Doors

## Size Limits

- Minimum Size\*: 350mm x 250mm
- Maximum Size\*: 4500mm x 2700mm

\*\*The maximum unit area permissible under AS1288 needs to be taken into consideration too. Sizes outside of these limits may be available as a special order on request \*\*

## How to Specify

- **Select glass name**  
Viridian ClimaTech™
- **Select limiting tone**  
Colours: Clear, Light Grey\*, Grey\*, Bronze\*, Green\*, SuperBlue™\*, SuperGreen™\*  
\*6mm only
- **Select thickness** - 4mm, 5mm, 6mm
- **Select spacer width** - 8mm to 20mm
- **Select spacer type**  
Aluminium spacer supplied as standard.
- Available in toughened only.

## Product Range

- **Residential**  
4mm and 5mm available in Clear only.  
6mm available in Clear, Light Grey and Grey Tones.
- **Commercial**  
6mm available in Clear, Light Grey, Grey, Bronze, Green, SuperBlue™ and SuperGreen™ Tones.
- Available with aluminium spacer as standard.

## Performance Comparison

Outside Glass	Inside Glass	Nominal Thickness (mm)	VLT	U Value	SHGC	Application Suitability
4mm VFloat™ Clear	4mm Viridian ClimaTech™	4+12+4	77	1.5	0.64	Residential
5mm VFloat™ Clear	5mm Viridian ClimaTech™	5+12+5	75	1.5	0.61	Residential
6mm VFloat™ Clear	6mm Viridian ClimaTech™	6+12+6	74	1.5	0.60	Residential
6mm VFloat™ Light Grey	5mm Viridian ClimaTech™	6+12+5	53	1.5	0.45	Residential
6mm VFloat™ Grey	5mm Viridian ClimaTech™	6+12+5	35	1.5	0.35	Residential
6mm ClimaTech™	6mm VFloat™ Clear	6+12+6	74	1.5	0.54	Commercial
6mm VFloat™ Light Grey	6mm Viridian ClimaTech™	6+12+6	53	1.5	0.45	Commercial
6mm VFloat™ Grey	6mm Viridian ClimaTech™	6+12+6	35	1.5	0.35	Commercial
6mm VFloat™ Bronze	6mm Viridian ClimaTech™	6+12+6	43	1.5	0.42	Commercial
6mm VFloat™ Green	6mm Viridian ClimaTech™	6+12+6	63	1.5	0.40	Commercial
6mm VFloat™ SuperGreen™	6mm Viridian ClimaTech™	6+12+6	56	1.5	0.33	Commercial
6mm VFloat™ SuperBlue™	6mm Viridian ClimaTech™	6+12+6	44	1.5	0.32	Commercial

Viridian ClimaTech™ is a trademark of Viridian Glass





## PRODUCT

# LightBridge™

### LightBridge™ high performance double glazing – for the ultimate comfort & natural light in your home

Natural light is the key ingredient for making a comfortable and healthy home. That's why we designed our award-winning LightBridge™ range, so you can bathe in natural light and reconnect with your surroundings.

LightBridge™ double glazing units curb the flow of heat in and out of your home to an unparalleled degree. This allows you to have expansive glazing whilst still achieving an energy efficient home.

LightBridge™ is a range of high performance insulating glass units (IGU) developed specifically for residential building applications. Constructed with Low E glass and inert gas fill as standard, a high insulating factor is assured, whilst maintaining a very high level of visual clarity and visible light transmission levels. Spacer width can vary between 8mm and 20mm to meet the needs of the frame / specification.

LightBridge™ double glazed units are for use in fully framed windows and doors in detached residential and low-rise multi-residential building projects. The product is specifically designed to improve energy efficiency and/or increase the permissible glazed area of the design, thereby increasing access to natural light within the property.

The standard makeup of LightBridge™ is suitable for most common configurations of residential windows and doors capable of taking a double glazed unit.

The product may also be suitable for fully framed roof, skylight and other elevated or sloped glazing, provided that the selected makeup is compliant with AS1288.

### Considerations

- Selected glass types available in limiting glass thickness of 4mm, 5mm, 6mm or 8mm, which are available in annealed or toughened.
- Square and rectangle shapes only.

- The width of the spacer and the glass type selected will influence the U Value achieved.
- Grey variants should be considered for windows in hot climates, sun-exposed elevations, and applications subject to high glare.
- Thermal assessment may be required for lower SHGC variants.
- Privacy variants should be considered for bathrooms, bedrooms, windows adjacent to public areas and those subject to being seen into by neighbours or passers-by.
- For added acoustic performance, consider upgrading to **LightBridge next™**.
- Units must be installed with Viridian product label facing to the exterior.

- Available with aluminium spacer as standard, this product can be supplied with a warm edge thermal spacer at additional cost.

### Applications

- Residential Windows
  - Residential Doors
- (Residential application only)

### Size limits

- Minimum size\* 350mm x 250mm
- Maximum size\* 4500mm x 2700mm
- Maximum unit sizes will vary subject to final application, glass type and material thickness.

\*Sizes outside of these limits may be available as a special order, on request.

### Features and Benefits

- Exceptionally low U Value (high insulation factor) for a residential glazing product.
- Balance of high light transmission with mid-range solar control.
- Fully supported by the Viridian product Warranty Program.
- All components locally stocked, and units locally manufactured for short lead times and reliable supply.
- Five standard colour / privacy combinations are available: Clear, Light Grey, Grey, DécorSatin™ and DécorSatin™ Grey.

### How to Specify

- Select glass name**  
LightBridge™
- Select limiting colour and translucency**  
Colours: Clear, Light Grey, Grey, DécorSatin™, DécorSatin™ Grey
- Select thickness – process**  
4mm, 5mm, 6mm or 8mm annealed or toughened
- Select spacer width** - 8mm to 20mm
- Select spacer type**  
Aluminium spacer supplied as standard.

### ✓ Performance Comparison

LightBridge™	VLT	U Value	SHGC
Clear	78	1.4	0.55
Light Grey	56	1.4	0.43
Grey	37	1.4	0.32
DécorSatin™	78	1.4	0.55
DécorSatin™ Grey	37	1.4	0.33

\*6+ 6mm glass thickness

LightBridge™ is a trademark of Viridian Glass





PRODUCT

# LightBridge next™

**LightBridge next™ superior performance double glazing – for access to natural light, and ultimate thermal and acoustic comfort in your home.**

The way Australians build is changing. There is growing demand for sustainability and amenity more than ever before. This is why we created the next evolution of our LightBridge™ double glazing product, LightBridge next™.

LightBridge next™ double glazed units control the flow of heat in and out of your home. The thermally efficient spacer technology and addition of an acoustic performance interlayer brings performance to the next level. Allowing you to have larger spans of seamless glazing for optimal natural light, without compromising on thermal or noise comfort.

LightBridge next™ has improved thermal edge performance due to its non-conductive spacer that outperforms traditional materials. This spacer minimises energy loss and there is also a greater reduction in the potential for condensation to form at the edge. When it comes to building sustainable windows, LightBridge next™ offers enhanced thermal performance whilst being aesthetically pleasing and offering the same width options between 8 and 24mm.

LightBridge next™ contains a specially formulated glass to dampen noise, providing enhanced sound insulation performance.

Lightbridge next™ offers improved acoustic performance by reducing outside sound by 29% in comparison to ordinary 4mm LightBridge™.

LightBridge next™ has been tested to Grade A safety glass standards and offers high UV protection, reducing the rate of fading for furnishes and finishes.

### Considerations

- The limiting glass thickness is 4mm, 5mm, 6mm or 8mm.
- Available in simple shapes. Complex shapes on application.
- The width of the spacer and the glass type selected will influence the U Value achieved.
- Grey and Light Grey variants should be considered for windows in hot climates, sun-exposed elevations, and applications subject to high glare. Thermal assessment recommended.
- Thermal assessment may be required for lower SHGC variants.
- Units must be installed with Viridian product label facing to the exterior.

### Features and Benefits

- Includes a warm edge non-conductive spacer as standard, this spacer outperforms traditional materials minimising energy loss and finished in matte black for a seamless look.
- The non-conductive spacer leads to greater reduction in condensation forming at the edge.
- Contains a specially formulated glass to dampen noise, providing enhanced sound insulation performance.
- High UV protection, reducing the rate of fading for furnishing and finishes.
- Exceptionally low U Value (high insulation factor) for a residential glazing product.
- Balance of high light transmission with superior solar control.
- Tested to Grade A safety standards.
- Resists penetration from accidental or deliberate impact if glass is broken.\*
- Fully supported by the Viridian product Warranty Program.
- All components locally stocked, and units locally manufactured for short lead times and reliable supply.
- Standard tones available are Clear, Light Grey and Grey.

+ Outer glass only

- DécorSatin™ privacy option as standard, other privacy options available on application. Outside glass only.

### Applications

- Residential windows and doors

### Size Limits

- Minimum size\* 350mm x 250mm
  - Maximum size\* 4500mm x 2700mm.
  - Maximum unit sizes will vary subject to final application, glass type and material thickness.
- \* Sizes outside of these limits may be available as a special order, on request.

### How to Specify

- **Select glass name**  
LightBridge next™
- **Select limiting colour**  
Clear, Light Grey or Grey
- **Select thickness** - process 4mm, 5mm, 6mm or 8mm toughened. Annealed only offered in 4mm options.
- **Select spacer width** - 8mm to 24mm.

### Performance Data

Glass Type	VLT	U Value	SHGC	RW
LightBridge next™ Clear				
4mm	79	1.4	0.54	36
5mm	79	1.4	0.54	37
6mm	78	1.4	0.54	38
8mm	78	1.4	0.54	41
LightBridge next™ Light Grey				
4mm	53	1.4	0.41	36
5mm	53	1.4	0.41	37
6mm	52	1.4	0.41	38
8mm	52	1.4	0.41	41
LightBridge next™ Grey				
4mm	38	1.4	0.35	36
5mm	38	1.4	0.35	37
6mm	38	1.4	0.35	38
8mm	37	1.4	0.35	41

LightBridge next™ is a trademark of Viridian Glass





## PRODUCT

# PerformaTech™

High performance double glazing – for top-tier thermal performance & light transmission

**We believe that light and comfort should go hand-in-hand. That's why we created PerformaTech™ – giving you the opportunity to design beautiful, affordable and sustainable buildings.**

**PerformaTech™ balances high levels of light transmission with very low levels of solar heat gain to provide you with a brighter and more comfortable space.**

The **PerformaTech™** range uses a high performance coating that restricts UV and infrared radiation from passing through but importantly provides exceptional levels of natural appearance.

The high levels of performance associated with **PerformaTech™**, affords the opportunity to create economically viable, aesthetically pleasing and environmentally sustainable buildings. This in turn enables the increasingly stringent demands of regulatory requirements and prospective owners or tenants to be easily met.

Available only as part of an insulating glass unit (IGU). **PerformaTech™** is available in either heat strengthened or toughened form. Our standard range includes 8 products. However, any performance characteristics can be matched using **PerformaTech™**.

Units must be installed with Viridian product label facing to the exterior.

## Features and Benefits

- Exceptional balance of high light transmission, low solar heat gain and low U Values.
- Fully supported by the Viridian product Warranty Program.
- Local range of product combinations.
- Available only as part of an insulating glass unit (IGU) for maximum performance.
- Available with aluminium spacer as standard, this product can be supplied with a warm edge thermal spacer at additional cost.

## Applications

- Windows
- Facades
- Overhead glazing
- Curtain wall

## Maximum Size

- 4500mm x 2700mm  
\* Subject to glass type and material thickness

## How to Specify

- **Select glass name**  
Refer to performance comparison table
- **Select thickness - process**  
6+12+6 IGU
- **Select spacer type**  
Available with aluminium spacer as standard

## ✓ Performance Comparison

Outside Glass	Inside Glass	Nominal Thickness	VLT	U Value	SHGC
PerformaTech™ PH08	VFloat™ Clear	6+12+6	68	1.3	0.33
PerformaTech™ PH20	VFloat™ Clear	6+12+6	46	1.3	0.19
PerformaTech™ PH25	VFloat™ Clear	6+12+6	59	1.3	0.25
PerformaTech™ PH30	VFloat™ Clear	6+12+6	68	1.3	0.29
VFloat™ Light Grey	PerformaTech™ PH30	6+12+6	47	1.3	0.29
VFloat™ Grey	PerformaTech™ PH30	6+12+6	32	1.3	0.23
VFloat™ Green	PerformaTech™ PH30	6+12+6	58	1.3	0.31
VFloat™ Bronze	PerformaTech™ PH30	6+12+6	39	1.3	0.26

PerformaTech™ is a trademark of Viridian Glass





PRODUCT

# VistaTech™

Ultimate performance triple glazing – for optimal thermal performance & light transmission

For the ultimate glass experience, VistaTech™ is the latest trend of glass technology in Australia, designed to provide optimal thermal performance and natural acoustics compared to standard glazing.

With increased demand for better insulated products and the rise of sustainable building measures, VistaTech™ triple glazed units provide unwavering performance benefits that align with the passive house movement and 7 Star building standards in Australia.

### Increased Comfort

The three-pane technology is five times more efficient than double glazed units, providing the most thermally efficient residential window and door systems currently available in Australia.

### Natural Acoustics

Triple glazed makeups provide an acoustic solution without the use of interlayers, creating a natural sound barrier that not only maintains comfort levels felt within but keeps unwanted noise out.

### Safety and Protection

VistaTech™ triple glazing has an added layer of

protection to assist in the prevention of unwanted intruder entry, ensuring your home is secure.

## Considerations

- Suitability of glazing compounds, sealants and gaskets need to be approved by Viridian
- The Viridian Warranty relies on frame design in accordance with AS2047
- Perimeter seals must be concealed inside glazing rebates and not exposed to radiant ultra violet light or extended exposure to natural sunlight
- Do not store units externally or expose to prolonged moisture prior to installation into window frames
- Do not expose VistaTech™ edges to standing water and moisture as this can result in seal failure
- The frames must incorporate impervious weather seals or an efficient self-draining system
- Wind load and safety determine the type and thickness of glass required, refer AS1288 or AS1170.1
- When transporting and/or installing at altitudes of 800m and above, special air pressure equalisation requirements may apply and must be brought to the attention of Viridian

## Features and Benefits

- Superior insulation with the inclusion of a soft coat Low E coating
- Allows you to better manage window to wall ratio to balance thermal and daylight requirements
- A range of toned options available to meet aesthetic requirements
- Can be customised to support design or additional acoustic requirements
- Very high performance available in clear options
- Processed in Australia
- 10 year Warranty from date of manufacture

## Applications

- Residential windows and doors\*  
\*Specifically suited to thermally broken aluminium, uPVC and timber systems
- Façade
- Office buildings
- Health

## Size Limits

- Minimum Size\*: 600mm x 400mm  
\*Minimum size charge of 1m2
- Maximum Size\*\*: 5000mm x 3100mm  
\*\*Subject to component, spacer and weight limitations
- The maximum unit area permissible under AS1288 needs to be considered.

## How to Specify

- **Select glass name**  
VistaTech™ or VistaTech™ XP
- **Annealed tones available** - Clear
- **Toughened tones available** - Clear, Green, Grey, Light Grey
- **Thicknesses available** - 4mm, 5mm, 6mm, 8mm
- **Spacer width available** - 10mm to 20mm
  - Available as Warm Edge Tri Seal Spacer only
  - Spacer types can only be supplied in equal thicknesses per unit
  - Maximum unit width must equal 60mm
- Low E glass types available as toughened only
- Other glass types available upon request
- **Shapes available** - Simple square and rectangular, complex shapes on application
- VistaTech™ can be incorporated with other products from our Energy, Safety and Security ranges for further benefits

## ✓ Performance Comparison

Product Name	Outside Glass	Centre Glass	Inside Glass	Nominal Thickness (mm)	VLT	U Value	SHGC
VistaTech™ Ultimate Performance							
VistaTech™ Clear	VFloat™ Clear	LightBridge™	VFloat™ Clear	4+12Ar+4+12Ar+4	73	1.07	0.53
VistaTech™ Green	VFloat™ Green	LightBridge™	VFloat™ Clear	5+12Ar+4+12Ar+4	64	1.07	0.37
VistaTech™ Grey	VFloat™ Grey	LightBridge™	VFloat™ Clear	5+12Ar+4+12Ar+4	38	1.07	0.32
VistaTech™ Light Grey	VFloat™ Light Grey	LightBridge™	VFloat™ Clear	5+12Ar+4+12Ar+4	55	1.07	0.40
VistaTech™ PH08	PerformaTech™ PH08	VFloat™ Clear	VFloat™ Clear	6+12Ar+4+12Ar+4	64	1.02	0.30
VistaTech™ PH30	PerformaTech™ PH30	VFloat™ Clear	VFloat™ Clear	6+12Ar+4+12Ar+4	64	1.03	0.27
VistaTech XP™ Xtreme Performance							
VistaTech™ Clear	VFloat™ Clear	LightBridge™	LightBridge™	4+12Ar+4+12Ar+4	72	0.74	0.50
VistaTech™ Green	VFloat™ Green	LightBridge™	LightBridge™	5+12Ar+4+12Ar+4	63	0.74	0.35
VistaTech™ Grey	VFloat™ Grey	LightBridge™	LightBridge™	5+12Ar+4+12Ar+4	38	0.74	0.28
VistaTech™ Light Grey	VFloat™ Light Grey	LightBridge™	LightBridge™	5+12Ar+4+12Ar+4	54	0.74	0.36
VistaTech™ PH08	PerformaTech™ PH08	LightBridge™	VFloat™ Clear	6+12Ar+4+12Ar+4	62	0.71	0.29
VistaTech™ PH30	PerformaTech™ PH30	LightBridge™	VFloat™ Clear	6+12Ar+4+12Ar+4	62	0.71	0.29

VistaTech™ is a trademark of Viridian Glass





> VIRIDIAN GLASS GUIDE™

# Noise

Designed to reduce the outside noise so you can enjoy a little peace and quiet.

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Products: VLam™ Hush  
ComfortHush™



# A sound solution for effective noise reduction

## Reducing Unwanted Noise

Whether it's from traffic, aircraft, trains, factories or even neighbours, unwanted noise is a nuisance but it can be reduced with the right selection of glass. The **VLam™ Hush** and **ComfortHush™** range of laminated glass is specifically developed to do just that.

## Reduce Vibration

Ordinary glass can vibrate at the same frequency as the noise source, allowing sound to penetrate through the window. **VLam™ Hush** and **ComfortHush™** includes a special 3-layer laminate that has been specifically engineered to reduce vibration, making it effective in reducing urban noise.

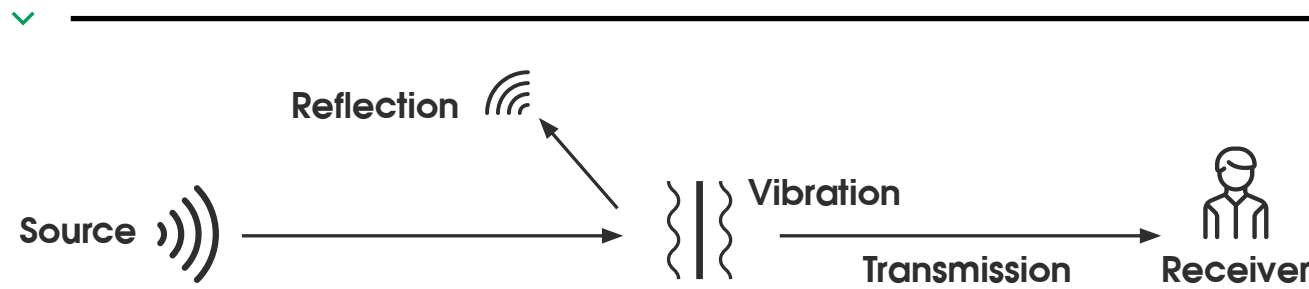
## Reduce the Transmission of Noise

There are three things that occur when sound waves encounter a window:

1. They may be **reflected** away, causing little concern to those inside the building
2. They may be **absorbed** through dampening and dissipated, causing little concern to those inside the building
3. **What isn't reflected or absorbed is transmitted through the window by vibration or air leakage**

## Addressing a Noise Problem

Typically the weakest point in a home is the windows. Installing windows with good acoustic performance needs to be supported with the careful selection and insulation of walls, floors and roof materials to enhance the overall acoustic performance of your home. It is essential to ensure that all other paths in the exterior of the building have also been sealed.



Typically, suburban traffic noise is a low frequency noise, while aircraft produce a high frequency noise.

Table 1

Common sound levels		Recommended interior noise levels	
Environment	dB		dB
Threshold of hearing	0	Bedroom	30-40
Conventional speech	65	Classroom	35-40
Average traffic (curbside)	70	Living room	40-45
Busy traffic	75	Private office	40-45
Loud traffic	80	Open office	45-50
Live band (20 metres)	105		

Table 2 - Sound Insulation data (dB)

	Monolithic							Laminated			VLam™ Hush			
Thickness (mm)	3	5	6	10	12	15	19	6.38	10.38	12.38	6.5	8.5	10.5	12.5
Single	30	32	32	36	37	37	40	33	36	37	36	37	38	40
ThermoTech™	-	34	35	-	-	-	-	-	-	-	40	42	43	-

ThermoTech™ is an IGU with 16mm airspace and 6mm, 8mm or 10mm outer and 8.5mm VLam™ Hush inner.

Note: Contact Viridian for additional test data





## Designing to Solve a Noise Problem

There are generally three components to be considered when solving a noise problem. These are the external noise, the noise reduction of the wall (windows and glazing) and the resulting noise in the room. The process of design requires that the external noise level is determined by measurement and the desired internal noise level is decided (Refer to table 1).

The source of the noise may be higher at certain frequencies. Typically, suburban traffic noise is a low frequency noise, while aircraft produce a high frequency noise.

A detailed solution would involve measuring the nature and intensity of the offending sound and choosing a glass product which would reduce the intensity sufficiently at all frequencies.

It should be noted that glass is only one part of the room and all other components must be assessed as well.

## Reduce Air Leakage

Cracks, crevices and even the smallest gaps will greatly reduce the performance of windows by providing opportunities for sound to travel through. It is critical that **VLam™ Hush** and **ComfortHush™** are used in combination with a carefully selected window frame that is well sealed to significantly reduce air leakage. Many window manufacturers make and test windows designed to improve acoustic performance and energy efficiency. It is important these windows are professionally installed to reduce air leakage by ensuring a good seal between the exterior of the window and the wall it is being installed into.

## Sound Reduction Index

- The Weighted Sound Reduction Index (**Rw**) is a number used to rate the effectiveness of a soundproofing system or material. Increasing

the **Rw** by one translates to a reduction of approximately 1db in noise level. Therefore, the higher the **Rw** number, the better a sound insulator it will be.

- The **coincidence dip** is the frequency at which the glass panel vibrates in unison with the frequency of the incident sound pressure waves. The result is the sound insulation properties of glass being strongly reduced at this specific frequency.



**The nature of the decibel scale illustrates how a small variation in decibels equates to quite a large difference in what we hear. A difference of 5dB is identifiable by the human ear.**

## Common Solutions

**Thick glass** – the greater the thickness the better the noise reduction for low frequencies such as traffic noise. However, standard glass has a coincidence dip when the glass vibrates at the same frequency as the noise source. This is dependent on glass thickness but generally occurs at higher frequencies.

**Laminated glass** – the interlayer is particularly effective at dampening which provides superior sound reduction over the same thickness monolithic glass. Further, the dampening effect of laminated glass reduces the coincidence dip at these higher frequencies and therefore is a solution for aircraft and voice noise.

**Double glazing** – standard insulating glass units do not provide good noise reduction. For insulating glass units to be effective, an air gap of 50mm to 100mm needs to be provided. However, the incorporation of one or two panels of laminated glass, a glass of differing thickness or **VLam™ Hush** into the unit provides excellent results.



**Normal Conversation** - 60dB



**Dog Barking** 70dB -  
2x as loud  
as 60dB



**Loud Traffic**  
80dB - 4x as loud  
as 60dB



**Train Whistle at 150m**  
90dB - 8x as loud  
as 60dB



**Lawn Mower**  
100dB - 16x as loud  
as 60dB



**Rock Concert**  
100dB - 16x as loud  
as 60dB





## PRODUCT

# VLam™ Hush

**VLam™ Hush** is a laminated glass that uses a specially developed interlayer to dampen noise, providing enhanced sound insulation performance.

This special interlayer targets sounds through the frequency range with an enhanced effect on higher frequencies - the most sensitive range of human hearing. Common solutions for noise reduction is to use thicker glass, **VLam™ Hush** means that thinner and lighter glass can be used for equivalent acoustic performance.

**VLam™ Hush** reduces the coincidence dip of standard monolithic and laminated glass.

## Considerations

Proper assessment of the entire building is required in order to develop an adequate acoustic solution. Selection of frames, walls, floor and roof materials is essential to ensure good overall acoustic performance.

✓ **VLam™ Hush uses a special interlayer that targets sounds through the frequency range with an enhanced effect on higher frequencies - the most sensitive range of human hearing.**

## Features and Benefits

- **VLam™ Hush** is a laminated Grade A safety glass (AS/NZ2208).
- **VLam™ Hush** can be used in a wide range of internal and external applications.
- Available in 6.5mm to 12.88mm thicknesses.
- Can be combined with other solar control options.
- Can be incorporated in a double glazed unit.
- Reduces UV radiation by 99% reducing fading up to 8.5 times over normal glass.

## Applications

- Windows & Doors
- Facade
- Partitions
- Overhead Glazing

## Thickness

- From 6.5mm to 12.88mm

## How to Specify

- **Select glass name**  
VLam™ Hush
- **Select thickness – process**  
6.5mm to 12.88mm – Laminated
- **Select colour**  
Refer to product range chart

## ✓ Product range

	Thickness (mm)						
VLam™ Hush	6.5	6.88	8.5	10.5	10.88	12.5	12.88
Clear	◆		◆	◆		◆	
Grey		◆			◆		◆
Translucent		◆			◆		◆

Other custom laminated options available

✓ **VLam™ Hush can be used in a wide range of internal and external applications.**





## PRODUCT

# ComfortHush™

**ComfortHush™** is an acoustic performance glass which also features a durable Low E coating. It is a Grade A laminated safety glass that uses a special 3-layer acoustic PVB laminate that is specifically designed to reduce sound transmission. The inclusion of a durable Low E coating also provides improved energy efficiency performance, by helping to keep homes and buildings cooler in summer and warmer in winter.

**ComfortHush™** 6.5mm and 6.88mm provides a 6dB improvement compared to ordinary 3mm glass found in many residential windows. In fact, ordinary 3mm glass would need to be at least three times as

thick to offer the equivalent sound reduction as **ComfortPlus™** 6.5mm and 6.88mm.

## Considerations

**ComfortHush™** fits into most single glazed window frames. However, to avoid noise leaks, you need to ensure that **ComfortHush™** is installed in a frame that's well sealed and professionally fitted. If the frame isn't sealed properly, then **ComfortHush™** can't work to its full potential.

Glass must be installed with the Viridian label facing to the exterior of the building.

✓ **ComfortHush™** uses a laminated safety glass that uses a special 3-layer acoustic PVB laminate that is specifically designed to reduce sound transmission

## Features and Benefits

- **ComfortHush™** 6.5mm and 6.88mm can be installed into most single glazed window frames.
- **ComfortHush™** 6.5mm and 6.88mm provides up to 39% better insulation than ordinary 4mm glass resulting in a more comfortable home and energy savings all year round.
- Reduces UV radiation by 99% reducing fading up to 8.5 times over normal glass.
- **ComfortHush™** is a laminated Grade A safety glass (AS/NZ2208).

## Applications

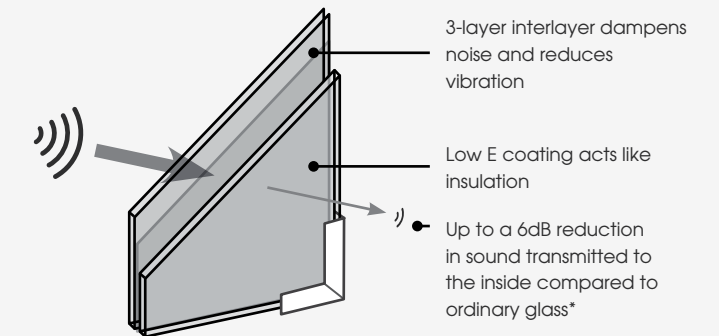
- Windows & Doors
- Facades
- Overhead Glazing

## Thickness

- From 6.5mm to 10.88mm

## How to Specify

- **Select glass name**  
ComfortHush™
- **Select thickness – process**  
6.5mm to 10.88mm – Laminated
- **Select colour**  
Refer to product range chart

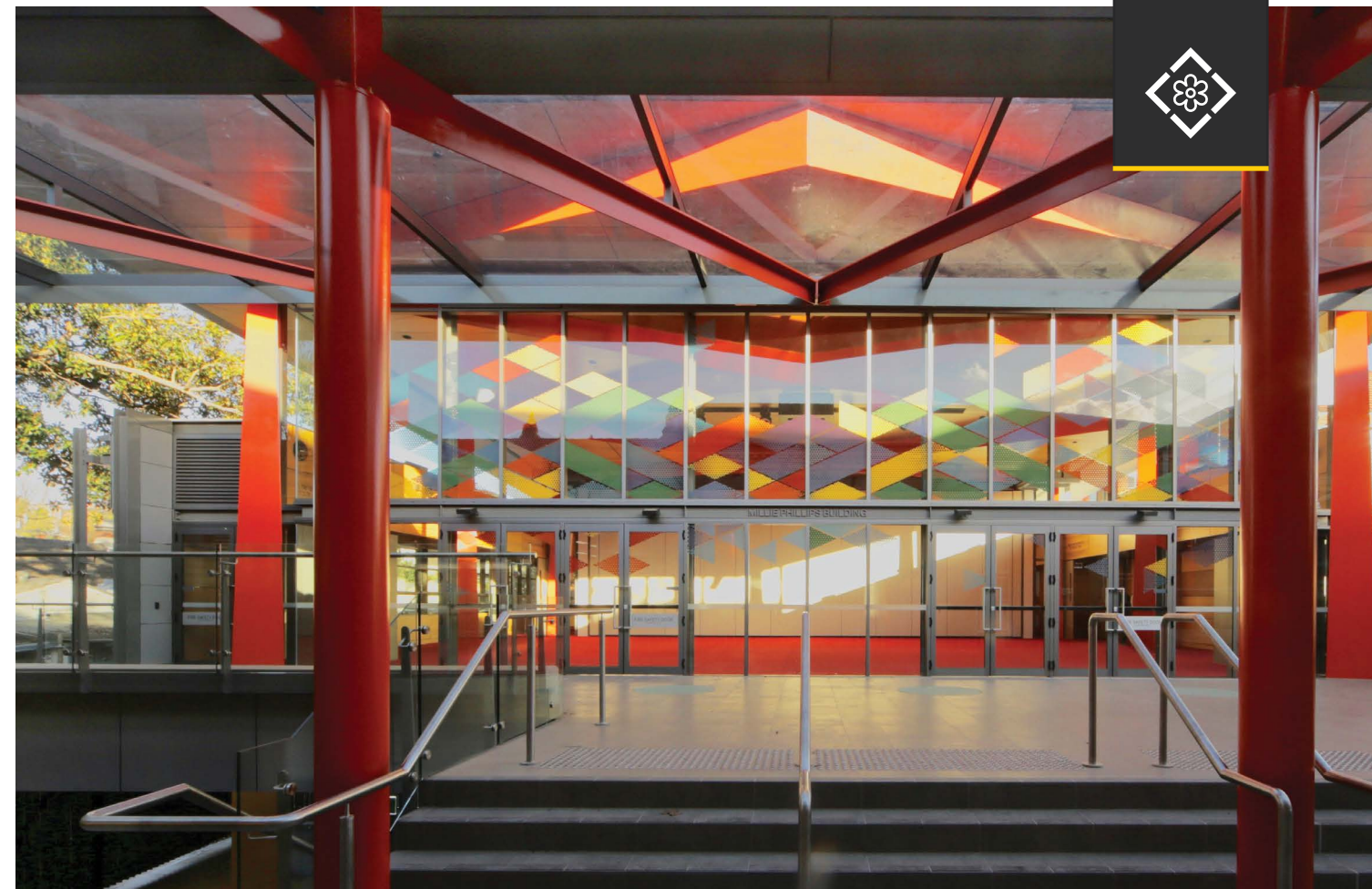


✓ **VLam™ Hush** uses a special interlayer that targets sounds through the frequency range with an enhanced effect on higher frequencies - the most sensitive range of human hearing.

## ✓ Product Range

	Thickness (mm)			
ComfortHush™	6.5	6.88	10.5	10.88
Clear	◆		◆	
Neutral	◆		◆	
Grey		◆		◆
Translucent		◆		◆





> VIRIDIAN GLASS GUIDE™

# Decorative

Don't think that glass only performs functionally as a part of your home or building – it's also useful as a decorative tool. Any space is capable of shining with the right use of glass.

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**Products:**

DécorSatin™  
VLam™ Translucent  
ColourBack™  
DécorColour™  
Seraphic™  
Seraphic™ Design  
DécorMirror™  
DécorPattern™  
PixaGraphic™





## PRODUCT

# DécorSatin™

Acid-etched glass – for privacy and diffused daylight

Sometimes a space needs to be both connected with the outside world and independent from it – letting in the light whilst keeping what's inside private. The DécorSatin™ range does just that.

DécorSatin™ strikes the perfect balance between allowing natural light in and making your room a sanctuary. The translucent satin finish suits modern spaces and is a practical solution suited to a range of applications.

DécorSatin™ is a float glass, where one side has been treated with an acid etch to produce a satin finish. This process is applied to the entire sheet of glass post manufacture, to ensure an overall consistent finish. The finish is both moisture and UV resistant, making it ideal for exterior as well as interior applications.

## Features and Benefits

- Easy to process, DécorSatin™ can be toughened, laminated, or combined as part of an insulated glass unit.
- Suitable for both interior and exterior applications.
- High light transmission.

## Performance Comparison

Product*	VLT	U Value	SHGC
DécorSatin™	88	5.8	0.82
DécorSatin™ Grey	42	5.8	0.58

\*6mm glass thickness

## Applications

- Balustrades
- Facade
- Furniture
- Partitions
- Shower screens\*
- Windows
- Doors
- Overhead Glazing\*

## Considerations

\* Satin finish needs to be installed facing away from moisture exposed areas.

Suitable for both interior and exterior applications.

## How to Specify

- **Select glass name**  
DécorSatin™, DécorSatin™ Grey,
- **Select thickness - process**  
4mm to 12mm – Annealed  
4mm to 12mm – Toughened  
4mm to 12mm – Heat Strengthened  
8.38mm to 25.52mm – Laminated  
9.52mm to 25.52mm – Toughened/Laminate

## Product Range

Product	Thickness (mm)			
	4	6	10	12
DécorSatin™	◆	◆	◆	◆
DécorSatin™ Grey	◆	◆		

DécorSatin™ is a trademark of Viridian Glass





## PRODUCT

# VLam™ Translucent

Translucent laminated glass – for low maintenance privacy and soft daylighting

**Everybody likes a little bit of alone time every now and then, so you can ensure the private areas of your space stay that way with VLam™ Translucent.**

**With a stylish frosted appearance, VLam™ Translucent is durable, reliable and designed to secure your privacy.**

VLam™ Translucent provides a frosted appearance made by bonding two sheets of glass together with a translucent PVB interlayer. The result is a durable glazing material that can

be used for a variety of applications.

As the translucent interlayer is contained between the two sheets of glass, the product does not finger-mark and is easy to clean.

Where privacy is an important consideration, this product is appropriate for obscuring vision and diffusing light.

**VLam™ Translucent** has an opaque appearance and a light transmission of 68%.

**VLam™ Translucent Grey** has a frosted grey appearance and a light transmission of 32%.

**VLam™ Translucent SuperClear™** has a premium frosted appearance and a light transmission of 70% (10.38mm).

## Features and Benefits

- Contemporary range – stocked for ease of availability.
- Economical method of providing permanent privacy and decoration.

## Applications

- Partitions
- Balustrades
- Facades
- Windows
- Doors
- Overhead Glazing
- Furniture
- Shower screens\*

\*Fully framed only

## How to Specify

- **Select glass name**  
VLam™ Translucent, VLam™ Translucent Grey or VLam™ Translucent SuperClear™
- **Select thickness - process**  
6.38mm to 12.38mm – Laminated  
6.38mm to 12.76mm – Laminated  
7.52mm to 13.52mm – Toughened/Laminate

It is appropriate for obscuring vision and diffusing light

## Product Range

Product	Thickness (mm)				
	6.38	6.76	8.38	10.38	12.38
VLam™ Translucent	◆		◆	◆	◆
VLam™ Translucent Grey		◆			
VLam™ Translucent SuperClear™				◆	◆

## Performance Comparison

Product	VTI	U Value	SHGC
6.38mm VLam™ Translucent	68	5.7	0.70
6.76mm VLam™ Translucent Grey	32	5.7	0.56
10.38 mm VLam™ Translucent SuperClear™	70	5.6	0.77

VLam™ Translucent is a trademark of Viridian Glass





## PRODUCT

# ColourBack™

Coloured glass – for bright and beautiful spaces

Whether you want to make a bold style statement, or simply complement your design with a touch of colour – look no further than the ColourBack™ range.

ColourBack™ is easy to fit, ultra durable and requires minimal maintenance. The range is ideal for kitchen splashbacks, wall features, wardrobe doors and more.

ColourBack™ is a range of decorative glass panels using a 2-pack glass painting system.

Orders are custom processed, toughened and painted in the one location, to provide an efficient and timely result. Choose from a contemporary palette of 20 standard colours- all of them in stock to ensure shorter lead times- or give yourself total creative freedom by using our custom matching service to create the exact colour characteristics your design vision demands.

## Considerations

Virtually any colour can be matched using ColourBack™.

The natural green tone of standard VFloat™ can affect light colours and can be minimised by specifying SuperClear™ low iron glass. The painted side must be glazed to the interior of the building.

ColourBack™ must be selected, manufactured and glazed in accordance with relevant standards and Viridian processing guidelines for toughened glass. Recommendations on heat soak treatment apply.

This product is not suitable for external wall panels or spandrels. For these applications consider Seraphic™.

## Applications

- Splashback
- Internal wall cladding
- Bathroom wall cladding
- Wardrobe doors
- Furniture

## Maximum Size

- 3600mm x 1800mm
- Larger sizes may be available upon request

## Thickness

- 4mm to 19mm

## How to Specify

- **Select glass name**  
ColourBack™
- **Select thickness – process**  
4mm to 19mm - Non-toughened  
4mm to 19mm - Toughened and/or processed

## Features and Benefits

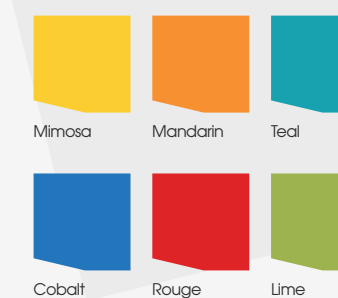
- ColourBack™ Standard colours are held in stock, for short manufacturing times.
- ColourBack™ Custom colours provides design freedom with infinite colour options.
- Glazing uses standard fittings, framing and neutral cure sealants.
- Once toughened or laminated to the relevant standard ColourBack™ is a Grade A safety glass (AS/NZ2208).

## Product range

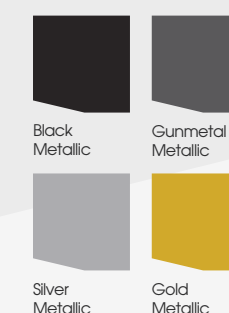
### Neutrals



### Brights



### Metallics



ColourBack™ is a trademark of Viridian Glass





## PRODUCT

# DécorColour™

Coloured laminated glass – for colourful light in your space

**Bright and vibrant spaces can elevate your mood and spark creativity – so why not enhance your environment with a touch of colour? Our DécorColour™ range helps you create inspiring interior designs.**

**Our customisable offering gives you thousands of possible colour combinations, so you don't need to settle for anything less than the perfect look.**

The **DécorColour™** range consists of 16 base interlayers - 12 transparent, 2 translucent and

2 opaque. By combining up to 4 interlayers you can blend in any combination to create thousands of options. The interlayers are manufactured using heat and light-stable pigments, not dyes, which enables you to use colour that is highly fade resistant. As the colour is laminated between two sheets of glass, the product is easy to clean and maintain. Being laminated, it is also Grade A safety glass.

**DécorColour™** gives you incredible flexibility and control over colour. Using the interlayer codes (refer to chart), create your unique combination:

- Colour 136A: (0001 + 0003 + 0006 + 000A)

## Features and Benefits

- Wide range of colour options available by combining base interlayers\*.
- **DécorColour™** can be combined with **Seraphic™ Design** for a patterned coloured option.
- Custom made to size only.
- Wide range of applications.
- **DécorColour™** is a laminated Grade A safety glass (AS/NZ2208).

## Applications

- Balustrades
- Facades
- Furniture
- Partitions
- Windows
- Doors
- Overhead Glazing

**The DécorColour™ range consists of 16 base interlayers - 12 transparent, 2 translucent and 2 opaque.**

## Maximum Size

- 3660mm x 2440mm

## Thickness

- 8.38mm to 13.52mm (dependant on number of interlayers required)

## How to Specify

- **Select glass name**  
DécorColour™
- **Select thickness – process**  
8.38mm to 13.52mm – Laminated  
9.52mm to 13.52mm – Toughened/  
Laminate
- **Select colour**  
Using the interlayer codes (refer to chart below) select your colour combination.

## Product Range

### Transparent



### Translucent



### Opaque



This colour chart is to be used as a guide only. The final glass colour may differ from these printed swatches.

\*Subject to volume requirements.

DécorColour™ is a trademark of Viridian Glass





## PRODUCT

# Seraphic™

Ceramic painted glass – for colourful and lustrous surfaces

**Glass offers a unique way to add colour to your design in a creative and inspiring way. If you'd like to brighten up your space with a little colour, consider Viridian Seraphic™.**

**Seraphic™** is a range of 20 standard opaque and translucent colours manufactured by screen printing a ceramic coating onto the glass prior to the toughening process. The toughening process fuses the ceramic paint to the glass surface to provide a permanent and durable finish.

**Seraphic™** in opaque colours is an excellent spandrel panel due to its low maintenance and heat resistance. Panels can either contrast or complement the vision glazing.

A method to match the vision glass is to use a double glazed unit with the vision glass and the inner glass being a **Seraphic™** colour so providing opacity and insulation.

## Considerations

Virtually any colour can be matched by the **Seraphic™** process and custom designs are also available. Lead times will vary on custom designs and colours.

The natural green tone of standard glass can affect light colours and can be minimised by specifying **SuperClear™** low iron glass. Translucent colours will also vary depending on light source and surrounding finishes.

**Seraphic™** can be used for exterior and interior applications. The painted side must be glazed to the interior of the building.

**Seraphic™** must be selected, manufactured and glazed in accordance with relevant standards and Viridian processing guidelines for toughened glass. Recommendations on heat soak treatment apply. Care should be taken to avoid back-lighting.

## Features and Benefits

- The **Seraphic™** colours are held in stock, for short manufacturing times.
- **Seraphic™** provides a wide range of colours to match or contrast with glass in curtain wall systems.
- Glazing uses standard fittings, framing and sealants.
- The ceramic coating is durable, lightfast and will not crack even in demanding applications up to temperatures of 250°C.
- **Seraphic™** are non-porous and easily maintained.
- Once toughened or laminated to the relevant standard **Seraphic™** is a Grade A safety glass (AS/NZS2208).

## Applications

- Facade Cladding
- External Wall Cladding

## Maximum Size

- 4500mm x 2200mm

## Thickness

- 4mm to 19mm

## How to Specify

- **Select glass name**  
Seraphic™
- **Select thickness – process**  
4mm to 19mm – Toughened  
4mm to 12mm – Heat Strengthened  
9.52mm to 39.52mm – Laminated  
9.52mm to 39.52mm – Toughened/Laminate
- **Select colour**  
(Refer to Product range swatches)  
All **Seraphic™** Custom colours are to be matched to either Dulux Master Palette™ or Dulux Powder Coat™ colour ranges only. Surcharges apply.

## Product Range

### Whites & Greys



White Snow White Frost Frost APO Grey

### Neutrals

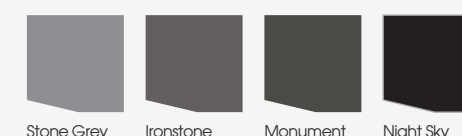


Surfmist Paperback Dune

### Brights



Signal Red Orange Lemon Yellow



Stone Grey Ironstone Monument Night Sky



Mangrove Woodland Grey Jasper



Shallow Sea Pommel Blue Mistletoe

This colour chart is to be used as a guide only. The final glass colour may differ from these printed colours.

The natural green tone of standard glass can affect light colours and can be minimised by specifying **SuperClear™** low iron glass.

**Seraphic™** is a trademark of Viridian Glass





PRODUCT

# Seraphic™ Design

Ceramic patterned glass – for privacy and solar control with decorative screening

Glass isn't restricted to only opening up your space to natural light. With our Seraphic™ Design products, you can deliver an exciting decorative element as well.

Seraphic™ Design is our range of screen printed designs available in the Seraphic™ colour range. Ideal for internal partitions, sunshades and more – you can add a decorative touch to your space while securing your privacy.

Seraphic™ Design is a range of 10 designs that are screen-printed onto the glass. Seraphic™ Design is available in any of the colours from the Seraphic™ range. In addition, virtually any colour can be matched and custom designs are also available.

## Features and Benefits

Seraphic™ Design can also be laminated with other Viridian solar control glass. This provides enhanced solar and glare control, privacy and a design motif. It is typically used in roof light glazing where Seraphic™ Design provides the opportunity for diffused lighting.

## Considerations

- When specifying colours please refer to the Seraphic™ colour chart. Non-standard colour reference should be made to either the Dulux Master Palette™ or Dulux Powder Coat™ colour ranges only.
- Translucent colours will vary depending on light source and surrounding colours.
- Glass has a natural green tone and this has an effect on the final colour. It is recommended that a colour sample be viewed in its final location.
- SuperClear™ low iron glass is available for colour correcting light colours.
- Seraphic™ Design as a laminated glass may be required by building codes in certain applications.
- Custom designs require new screens for printing and lead times will vary. Surcharges apply.



## Applications

- Partitions
- Spandrels
- Overhead Glazing

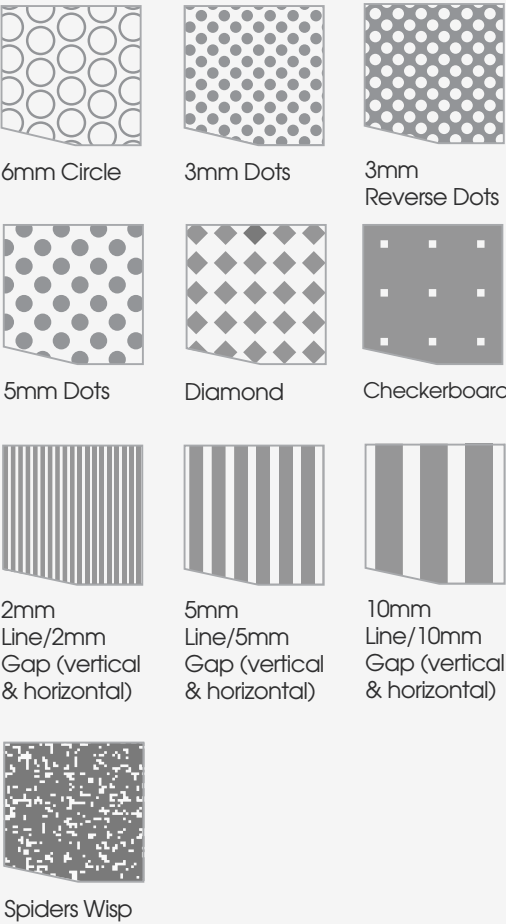
## Maximum Size

- 4500mm x 2200mm
- Maximum size will vary by design. Contact Viridian for details.

## Thickness

- 4mm to 19mm

## Product Range



\*Dark grey indicates printed area. Patterns are shown not to scale, please refer to samples or contact Viridian for more information.

## How to Specify

- **Select glass name**  
Seraphic™ Design
- **Select thickness - process**  
4mm to 19mm – Toughened  
4mm to 12mm – Heat Strengthened  
9.52mm to 39.52mm – Laminated  
9.52mm to 39.52mm –Toughened/  
Laminate
- **Select glass design**  
Refer to design chart

## Performance Data

Pattern	% Cover	Visible Light Transfer %	SHGC
6mm Circle	27%	69	0.70
3mm Dot	50%	48	0.56
3mm Reverse Dot	42%	59	0.63
5mm Dot	39%	61	0.64
Diamond	21%	74	0.72
Checkerboard	94%	23	0.41
2mm Line/ 2mm Gap	50%	54	0.60
5mm Line/ 5mm Gap	50%	54	0.60
10mm Line/ 10mm Gap	50%	54	0.60
Spiders Wisp	NA	NA	NA

Performance is an estimate only. Performance is based on Seraphic™ Design on 6mm Clear

Seraphic™ Design is a trademark of Viridian Glass





## PRODUCT

# DécorMirror™

Premium quality silvered glass – for seeing more of the world and reflecting light

Mirrors add a great sense of space to a room and provide valuable light reflection to enhance the available natural lighting. Our DécorMirror™ range offers the perfect addition to any room.

DécorMirror™ offers excellent light reflection, perfectly complementing a sleek modern design.

DécorMirror™ is a high specification mirror which incorporates excellent protection of the reflective silver coating without the need for the copper layer used in conventional mirror processes. It provides greater resistance to natural corrosion, so minimising the unsightly problems of black edges and spot faults. DécorMirror™ is also provided with two coats of special backing paint which gives additional protection from steam, moisture and chemicals. DécorMirror™ is suitable for edgework processing, including bevelling.

DécorMirror Safe™ complies with AS/NZS2208 for Grade A safety glazing materials. DécorMirror Safe™ is backed with a special polymer film.

## Considerations

There are many techniques that can be used to install mirrors, from framing to adhering directly to a door or wall. The adhesive to be used must be checked with the manufacturer for compatibility with DécorMirror™ paint or DécorMirror Safe™ vinyl backing.

Some cleaning solutions can damage the mirror coating so mild detergents are recommended. (Refer to the cleaning instructions on our website)

## Features and Benefits

- Higher corrosion resistance than conventional copper backed mirrors.
- Improved resistance to cleaners and adhesives.
- DécorMirror Safe™ is a Grade A safety glass (AS/NZ2208).

## Applications

### DécorMirror™

- Furniture
- Wall Cladding (non-safety applications)

### DécorMirror Safe™

- Wardrobe doors
- Wall Cladding (safety applications)

## How to Specify

- **Select glass name**  
DécorMirror™, DécorMirror Safe™
- **Select thickness - process**  
4mm to 6mm  
6.38mm – Laminated
- **Select colour**  
Refer to product range table

✓ **DécorMirror™ is suitable for edgework processing.**

## Product Range

Product	Thickness (mm)		
	4	5	6
DécorMirror™ Clear	◆	◆	◆
DécorMirror Safe™ Clear	◆		◆

### DécorMirror™ Clear



DécorMirror™ and DécorMirror Safe™ are trademarks of Viridian Glass





## PRODUCT

# DécorPattern™

Textured glass – for light diffusion and privacy

Whether it be at home or in an office, some spaces crave natural light yet still demand a level of privacy. The DécorPattern™ range is the cost effective option when lighting up a room – without sacrificing the privacy you desire.

Select from a wide range of styles and effects that dramatically change the aesthetic of a setting. From modern facades to old-world interiors, design the look that is perfect for your space with DécorPattern™.

DécorPattern™ is manufactured by passing a continuous molten glass ribbon between two rollers, one of which has a pattern that creates a permanent impression.

DécorPattern™ provides degrees of privacy through light diffusion and obscuration. The level of obscuration is indicated by:

## Features and Benefits

- Contemporary range – stocked for ease of availability.
- Economical method of providing permanent privacy and decoration.
- Clear and Toned options.
- Once toughened or laminated to the relevant standard DécorPattern™ is a Grade A safety glass (AS/NZ2208).

## Considerations

Toned texture glass absorbs solar radiation and may be subject to thermal stress. Further technical advice should be obtained from Viridian before specifying.

Some patterned glasses are sold as a directional patterns only.

## Applications

- Balustrades
- Furniture
- Partitions
- Showerscreens\*
- Windows
- Doors

\*Framed only

## How to Specify

- **Select glass name**  
DécorPattern™
- **Select thickness - process**  
4mm to 6mm – Annealed  
4mm to 6mm – Toughened  
4mm to 6mm – Heat Strengthened  
9.52mm to 13.52mm – Toughened/  
Laminate

## Product Range

Product	Clear			Grey		Glazing	
	4mm	5mm	6mm	5mm	Non Direct	Direct	Obscure
Satinlite	◆	◆	◆		◆		●
Spotswood	◆	◆	◆		◆		●
Cathlite	◆	◆				◆	○
Dark Grey				◆			●

● Most    ◐ Medium    ○ Least



Satinlite



Spotswood



Cathlite

DécorPattern™ is a trademark of Viridian Glass





## PRODUCT

# PixaGraphic™

Digitally printed safety glass - for limitless possibilities

**PixaGraphic™ transforms glass into a creative medium without limitation.**

**A scalable, all weather canvas upon which you can realise your visual ideas with exacting control, in brilliant colour and breathtaking, high resolution detail.**

**PixaGraphic™** is a range of decorative glass, manufactured using ceramic coated paint which is digitally printed directly onto the glass. With **PixaGraphic™**, turn a striking photograph into a stunning signature facade, an illustrative motif into a unique interior finish, or corporate branding into dynamic placemaking graphics. If you can picture it, **PixaGraphic™** can help you achieve it.

## Considerations

- **PixaGraphic™** must be heat treated before use.
- The natural green tone of standard glass can affect some design and can be minimised by specifying **SuperClear™** low iron glass.
- **PixaGraphic™** can be used for exterior and interior applications.
- The coated surface must be glazed to the inside of the building.

## Features and Benefits

- Resolution of the printed image can range from a standard quality of 360 dpi to a high-quality print at a phenomenal 1440 dpi.
- The **PixaGraphic™** manufacturing process combines hardwearing, ceramic inks, with the very latest in direct-on-glass digital printing technology. The inks fuse to the surface of the glass during toughening, creating a durable finish.
- Adjust the ink coverage to achieve the required level of light transmission & opacity.
- Viridian covers every panel produced with a 10 year Warranty from date of manufacture.
- Once toughened to the relevant standard **PixaGraphic™** is a Grade A safety glass (AS/NZ2208).

## Applications

- Balustrades
- Wall cladding
- Wardrobe Doors
- Splashbacks
- Doors
- Partitions
- Furniture
- Facades
- Windows
- Spandrels
- Overhead Glazing



**A scalable, all weather canvas upon which you can realise your visual ideas with exacting control**

## Maximum Size

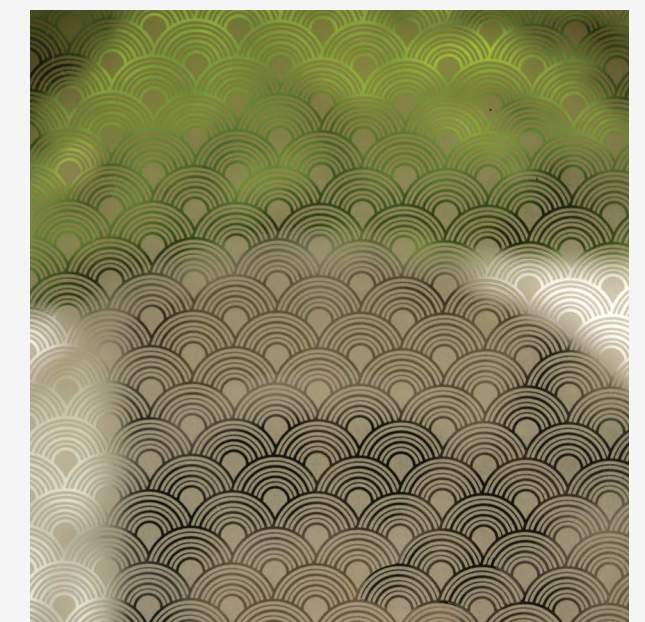
- 2440mm x 1220mm (4mm)
- 3400mm x 2000mm (5mm)
- 6000mm x 2800mm (6 to 19mm)

## Thickness

- 4mm to 19mm

## How to Specify

- **Select glass name**  
PixaGraphic™
- **Select thickness - process**  
4mm to 19mm – Toughened  
4mm to 12mm – Heat Strengthened  
9.52mm to 39.52mm – Toughened/  
Laminate



**PixaGraphic™** is a trademark of Viridian Glass





> VIRIDIAN GLASS GUIDE™

# Structural Systems

Providing a range of practical solutions that deliver you unrestricted views of the world.



Products: DécorFloor™  
ThermoTech™ Point Fixed IGU's







## PRODUCT

# DécorFloor™

Custom structural laminates – for creating spectacular entrances

**We've said it before and we'll say it again – when you think about glass, you shouldn't just think about windows. If you're looking for a way to make your space extra special, consider DécorFloor™.**

**Ideal for creating feature staircases, walkways, display areas and so much more, DécorFloor™ lets natural light enter your building across all levels, while also adding a distinct design touch to your space.**

DécorFloor™ is a high-end laminated product that not only encompasses the physical design elements that allow use in heavy trafficable

areas, but also combines the use of non-slip patterns for both practical and aesthetic considerations.

DécorFloor™ is a composite of three or more layers of various glass, with a PVB interlayer bonding these components together.

The top layer will always be a heat strengthened or toughened safety glass with a non-slip pattern fused onto the glass surface. The lower layers of glass act as a carrier to the live and dead loads.

DécorFloor™ requires technical expertise and our in-house engineers are qualified to advise prospective clientele in glass thickness and framing requirements for the product's correct use.

## Features and Benefits

- Custom made to meet your individual requirements.
- 6 standard non slip patterns available.
- Custom patterns available\*.
- Commonly used colours for the non-slip patterns are White Snow, White Frost and Frost but other options are also available (refer to **Seraphic™** page for colours).
- When using with Frost colour, **DécorFloor™** needs to be combined with a translucent White interlayer.
- Options of Clear or **SuperClear™** glass.
- Coloured interlayers can be incorporated (refer to **DécorColour™** page).
- +/- 0.5mm tolerance for all patterns thicknesses.

\*Subject to surcharge & suitability

## Considerations

Unless specified otherwise, **DécorFloor™** is designed for foot traffic only and is not suitable for use in vehicle traffic area, dance floors and bar areas.

High concentrated loads from trolleys, sharp objects or heavy furniture should be avoided.

Please speak to Viridian for further information.

## Non-Slip Patterns\*



**3mm Line  
10mm gap**

% Cover: 22%  
R Rating: R10



**3mm Line  
6mm gap**

% Cover: 33%  
R Rating: R11



**6mm Open  
Circle**

% Cover: 27%  
R Rating: R11



**10mm Dots**

% Cover: 21%  
R Rating: R10



**5mm Dots**

% Cover: 39%  
R Rating: R11



**Full Cover**

% Cover: 100%  
R Rating: R13

\* R Ratings derived from AS/NZS4586:2004 slip resistant classification of new surface materials.

\*\* Note that DécorFloor™ comes by default with full cover non-slip coating unless a pattern is specified.

## Applications

- Trafficable glass

## Maximum Size

- 2000mm x 2500mm

## How to Specify

- **Select glass name**  
DécorFloor™
- **Select thickness - process**  
29mm, 33mm, 47mm – Laminated  
29mm, 33mm, 47mm - Toughened Laminated  
Thicknesses are based on the floor being fully supported on all 4 edges
- **Select colours**  
Clear, SuperClear™  
Colours can be incorporated with paint or by introducing coloured interlayers (refer to **Seraphic™** and **DécorColour™** pages for options)
- **Select Design\***  
DécorFloor™ is always supplied with non-slip coating.

Non-slip coated panels can not be sold separately to the purchase of a **DécorFloor™** system.

Refer to design chart below for non-slip pattern options.

## Standard tested non-slip patterns and their slip resistant ratings

Pattern	% Cover	R Rating*
10mm Dot	21%	R10
3mm Line and 10mm Gap	22%	R10
3mm Line and 6mm Gap	33%	R11
6mm Open Circle	27%	R11
5mm Dot	39%	R11
Full Cover	100%	R13

\*R Ratings derived from AS/NZS4586:2004 slip resistant classification of new surface materials.

DécorFloor™ is a trademark of Viridian Glass





PRODUCT

# ThermoTech™ Point Fixed IGU's

ThermoTech™ Point Fixed IGU's continue the theme of performance glass without compromising natural light.

ThermoTech™ Point Fixed IGU's, supported by spider fittings, glass fins or cable trusses allow for less obtrusive framing systems than the traditional framed glazing techniques.

Without compromising natural light but enhancing performance, **ThermoTech™ Point Fixed IGU's** can now insulate large foyers of office buildings, airports, museums, art galleries and so on.

## Considerations

- Heat soak treatment is strongly recommended for toughened glass.
- All performance data is calculated using LBNL Windows 7.4 software based on AFRC 100-2010 conditions and is centre of glass value.
- The maximum edge deflection of an IGU under serviceability limit state actions is recommended to be no greater than span over 175.
- Articulated bolt fittings are recommended.
- The fixings are recommended to be 100mm away from the edges.

## Features and Benefits

- Processed into toughened or toughened laminated.
- Several glass combinations available (Clear, Toned, Low E, High Performance Coatings).
- Available in 4 pin, 6 pin and 8 pin support.
- The flexibility of the TPS spacer used between the glass panels, combined with a secondary seal and the fittings, allow for the double glazed units to move under wind pressure without compromising the seal.

## Applications

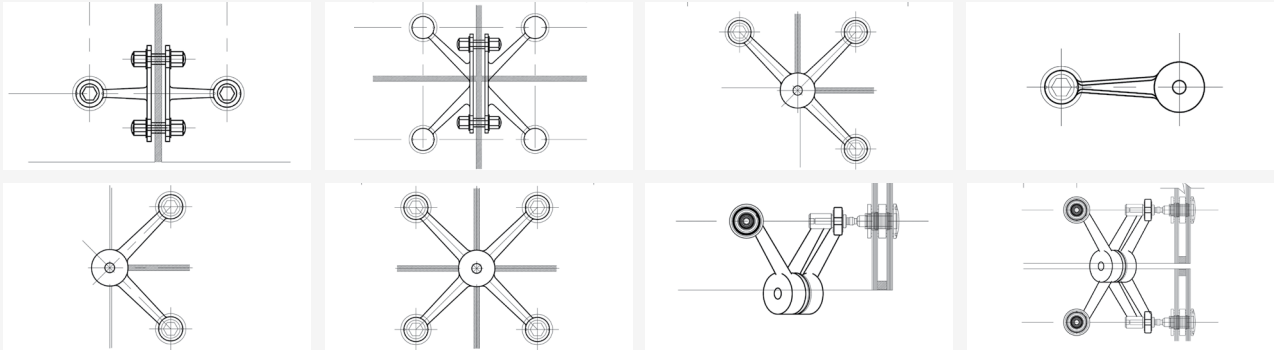
- Facades

## Maximum Size

- 4500mm x 2700mm

## How to Specify

- **Select glass name**  
ThermoTech™ Point Fixed IGU's
- **Select thickness - process**  
Minimum 8+12+8 – Toughened



## Performance Comparison

Glass type - IGU	Nominal Thickness (mm)	VLT	U Value	SHGC
10mm Clear / 12 Argon / 10mm Clear	32	76	2.5	0.62
10mm Green / 12 Argon / 10mm Clear	32	57	2.5	0.38
10mm Grey / 12 Argon / 10mm Clear	32	22	2.5	0.35
10mm SolTech™ (2) / 12 Argon / 10mm Clear	32	53	1.6	0.43
10mm Green / 12 Argon / 10mm EnergyTech™ (3)	32	53	1.6	0.33
10mm Grey / 12 Argon / 10mm EnergyTech™ (3)	32	21	1.6	0.30

For other thicknesses and data contact Viridian

ThermoTech™ is a trademark of Viridian Glass





> VIRIDIAN GLASS GUIDE

# Security

Enjoy all that natural light has to offer with peace of mind that your building is protected.

- 
- Products:**
- DécorMirror™ Oneway
  - IntruderGuard™ & AssaultGuard™
  - AssaultGuard™ Ultra
  - JailGuard™
  - BulletGuard™
  - Bespoke Custom Laminate Solutions



# Security glass for all threat levels

Whether it's a house window, a shop front or a security facility, Viridian has a security glass that provides the benefits of daylight and transparency with the peace of mind of security – all day, every day.

## Security Glass has been Developed to Resist:

- Physical attack from burglary and forced entry
- Ballistic attack

Viridian security glass comprises multiple layers of glass and special or thick interlayers, used for durability and resistance to attack. The thickness and type of interlayer provides resistance to penetration.

As with all security glass, the window frame system must also be capable of withstanding attack and retaining the glass.

Security glass can be configured to include solar and thermal control and decorative glass (subject to suitability of application and final product selection).

✓ **Glass thickness and weight have been reduced and light transmissions, as well as visual clarity, have been improved.**

## Ballistic Attack

Bullet resistant glass has become increasingly more advanced over time. Glass thickness and weight have been reduced and light transmissions, as well as visual clarity, have been improved.

The range of glass available correlates to the level of ballistic attack performance defined in Australian Standard AS2343. The glass construction is a combination of all glass or glass and polycarbonate and is designed to provide transparency, abrasion and bullet resistance.

The glass thickness range is 32mm to 45mm and is designed to resist an attack from a specified distance for a limited number of strikes. The natural green tone of the glass is apparent at this thickness and can be minimised by specifying **SuperClear™**.

For test details, performance and maximum sizes, please contact Viridian.





## PRODUCT

# DécorMirror™ Oneway

One-way security mirror – for discreet monitoring & reduced sound transmission

Oneway mirrors are the kind of thing we commonly see in the movies. However, they serve a very real role in our society, for interrogation rooms, market research and many more practical purposes.

We created DécorMirror™ Oneway to provide a oneway mirror that offers high quality vision and effectively provides discreet, unobtrusive monitoring. It has the appearance of a mirror on the subject side, while providing privacy for observers.

**DécorMirror™ Oneway** is reflecting coated glass that has the appearance of a mirror on the subject side, while providing privacy for observers. It is also laminated to provide protection from human impact and reduces noise transmission.

▼

**DécorMirror™ Oneway provides protection from human impact and reduces noise transmission.**

## Considerations

- To achieve privacy for observers, a light ratio of 1:7 is recommended, where the subject side is brightly illuminated and the observer side is dimly lit. Bright lighting sources must be avoided in the observer's area and spotlights directed away from the **DécorMirror™ Oneway** surface. We recommend using dark furnishing colours and that dark clothing be worn in the observation area.
- **DécorMirror™ Oneway** is normally used for internal applications. For external applications and natural lighting situations where variable lighting conditions exist, the **DécorMirror™ Oneway** performance can be affected.
- Glazing should be in accordance with the Australian Standard AS1288, and Viridian recommendations for laminated glass.
- The bronzed silver reflective surface must be installed to the subject side.

## Features and Benefits

- A safe and effective observation mirror for discreet monitoring.
- Appearance of a mirror.
- Laminated for safety.
- Low observer area lighting compared to subject area.
- Coating protected from scratching.
- Noise attenuation.
- Grade A Safety Glass.

## Applications

- Windows

## How to Specify

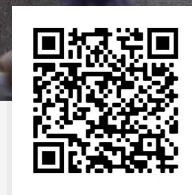
- **Select glass name**  
DécorMirror™ Oneway
- **Select thickness – process**  
8.76mm

▼

**A safe and effective observation mirror for discreet monitoring**

DécorMirror™ is a trademark of Viridian Glass





IntruderGuard™



AssaultGuard™

## PRODUCT

# IntruderGuard™ & AssaultGuard™

Security laminated glass – for transparent home security

**Want that extra level of protection for the weak spots of your building without detracting from the design visually? Then IntruderGuard™ and AssaultGuard™ are the solution for you.**

**IntruderGuard™ and AssaultGuard™ looks like normal glass but provides a barrier to forced entry that is 20 times harder to break through than standard float glass. So you can stay safe while still having the look that you love.**

IntruderGuard™ and AssaultGuard™ are specifically developed to offer a resilient and enduring barrier for vulnerable entry points across a broad range of applications. As a specialised laminated glass, they provide extra resistance to penetration thanks to its interlayer four times thicker than normal.

**IntruderGuard™** is a security glass for residential buildings and **AssaultGuard™** is typically used in commercial applications such as vulnerable shopfronts, windows and doorways susceptible to break in. It is also used in a variety of other 'at risk' applications such as pay booths, jewellers counters and display counters, providing enough resistance against 'smash and grab' theft. It is designed to resist attack from a variety of hand tools used for forced entry such as hammers, crowbars and wood splitters.

**AssaultGuard™ Ultra** can be used if a high level of security is required,

## Features and Benefits

- Resists penetration and forced entry – glass may break but interlayer retains integrity and continues to act as barrier.
- Withstands repeated blows from heavy objects such as bricks, hammers and crowbars.
- Reduces UV radiation by 99% reducing fading up to 8.5 times over normal glass.
- Reduces unwanted noise compared to standard glass.
- **IntruderGuard™** and **AssaultGuard™** are a laminated Grade A safety glass (AS/NZ2208).
- Can be supplied with solar control and privacy options and incorporated into a double glazed unit.

## Considerations

- **IntruderGuard™** should be incorporated with window frames and locks of sufficient strength.
- Consider incorporating **SuperClear™** to enhance the high light transmission often required in retail applications.

## Applications

- Windows
- Doors
- Facades
- Overhead Glazing
- Partitions

Withstands repeated blows from heavy objects such as bricks, hammers and crowbars.

## Maximum Size

- IntruderGuard™  
7.52mm: 3660mm x 2440mm
- AssaultGuard™:  
4600mm x 2760mm

## How to Specify

- **Select glass name**  
IntruderGuard™  
AssaultGuard™
- **Select thickness - process**  
IntruderGuard™ - 7.52mm – Laminated  
AssaultGuard™ - 9.52mm – Laminated  
AssaultGuard™ - 11.52mm – Laminated  
AssaultGuard™ - 13.52mm – Laminated
- **Select colour**  
Clear  
Other tones available by special order - PVB  
Interlayer options include: Grey, Bronze, Green and White Translucent

IntruderGuard™ and AssaultGuard™ are trademarks of Viridian Glass





PRODUCT

# AssaultGuard™ Ultra

Specialist security laminate – defined protection levels for high threat facilities

If you need a lightweight glass product that offers maximum security to meet your design requirements, then look no further than Viridian AssaultGuard™ Ultra.

Specially developed for use in areas like police stations and mental health facilities, AssaultGuard™ Ultra is the step up from AssaultGuard™ for delivering security.

Products within the AssaultGuard Ultra™ range are designed to withstand a variety of attacks. AssaultGuard™ Ultra products are manufactured using a variety of glass types and thicknesses combined with specialised security interlayers. (Spall films can be applied post installation to non-Low E coated glass products). It has demonstrated a strong resilience to concentrated attacks.

Additionally, if stringent energy efficiency requirements are specified, AssaultGuard™ Ultra can be supplied in a range of toned and Low E combinations or combined with our ThermoTech™ Insulated Glass Unit (IGU) range.

- AssaultGuard™ Ultra 10 – Minimum Security Glass:** AssaultGuard™ Ultra 10 is the base product in the range and ideal for use in low to medium risk facilities, such as observation or holding cells, police station detention areas, mental health institutes, banks, high-risk display cases (museums, art galleries, etc.) and pay offices.
- AssaultGuard™ Ultra 12 – Medium Security Glass:** AssaultGuard™ Ultra 12 is the mid-range product in the range. It is typically used in medium to high risk areas in facilities as well as juvenile justice centers, remand centers, high risk police detention areas and mental health facilities.
- AssaultGuard™ Ultra 14 – Premium Security Glass:** AssaultGuard™ Ultra 14 is the highest performing product in the range. It is specifically designed for applications requiring client observation where excellent integrity of product is required. This maximum security glass is typically used in maximum risk areas in facilities such as juvenile justice centers, remand centers and acute or forensic mental health facilities.



## Features and Benefits

- Conforms to AS/NZ2208 for safety glazing material.
- May be specified in a range of single and double glazed configurations.
- Can be used for both internal and external applications.
- Internal testing coupled with market recognition indicates prolonged impact resistance in non-rated security applications where design considerations may prevent the use of ordinary glass.
- Now part of a standard product range, making it easier to specify and purchase.
- Block 99% of unwanted UV light.

## Maximum Size

- AssaultGuard™ Ultra Non-coated:**  
10mm, 12mm :2500mm x 1500mm  
14mm: 3660mm x 2130mm
- AssaultGuard™ Ultra E:**  
10mm: 2000mm x 1000mm  
12mm: 2440mm x 1220mm  
14mm: 3500mm x 2130mm

## How to Specify

- Select glass name**  
AssaultGuard™ Ultra
- Select coated or non-coated**
- Select thickness - process**  
Nominate the level of security to determine thickness:  
**AssaultGuard™ Ultra 10**  
**AssaultGuard™ Ultra 12**  
**AssaultGuard™ Ultra 14**
- Select colour**  
Refer to table

## Applications

- Windows
- Doors
- Facades
- Overhead Glazing
- Partitions

## Product range

		Clear	Neutral	Green	Grey
Non Coated Range	AssaultGuard™ Ultra 10	◆		◆	◆
	AssaultGuard™ Ultra 12	◆		◆	◆
	AssaultGuard™ Ultra 14	◆		◆	◆
Low E Coated Range	AssaultGuard™ Ultra E 10	◆	◆	◆	◆
	AssaultGuard™ Ultra E 12	◆	◆	◆	◆
	AssaultGuard™ Ultra E 14	◆	◆	◆	◆

AssaultGuard™ Ultra is a trademark of Viridian Glass





## PRODUCT

# JailGuard™

Specialist security laminate – specially designed for use in correctional facilities

As the name suggests, JailGuard™ is specialised security glass that is tough enough to meet the standards of correctional facilities.

JailGuard™ is designed to resist attacks from all the typical hand tools that might be found within correctional facilities such as police stations, jails, remand centres and more.

JailGuard™ products are manufactured using a variety of glass types and thicknesses combined with high-end security interlayers. JailGuard™ can also incorporate low spall films if required.

Products within the JailGuard™ range are designed to withstand a variety of attacks from hand tools and typical implements such as brooms, mop buckets, billiard balls and other objects found within correctional institutes. Simulated attack conditions using axes, wood splitters, crowbars and other hand tools have shown products within the JailGuard™ range capable of resisting penetration for extended periods.

JailGuard™ is available in different levels of security:

JailGuard™ 10  
JailGuard™ 20\*  
JailGuard™ 30

\*Formerly JailGuard™ 22

## Features and Benefits

- JailGuard™ is independently tested. Test data and video results are available for review.
- Conforms to AS/NZS2208 for safety glazing material.
- May be specified in a choice of configurations – Clear, Toned, Low E and **DécorMirror™ Oneway** (subject to configuration and attack level).
- Can be used for both internal and external applications.

## Applications

- Windows
- Doors

## How to Specify

- **Select glass name**  
JailGuard™
- **Select thickness – process**  
Nominate the level of security to determine thickness  
JailGuard™ 10  
JailGuard™ 20\*  
JailGuard™ 30  
JailGuard™ E 10  
JailGuard™ E 20\*  
JailGuard™ E 30
- **Select colour**  
Clear, Low E Clear, Low E Neutral



JailGuard™ is a trademark of Viridian Glass





## PRODUCT

# BulletGuard™

Specialist security laminate – for protecting against firearm attacks

In buildings like banks, embassies and police stations, an extreme level of protection is needed to ensure the safety of people within. Our Viridian BulletGuard™ range delivers just that.

Our lightweight BulletGuard™ range protects from the threat of firearm attacks – as you have probably already guessed. What makes it extra special is that it also delivers excellent daylight transmission and clarity. So you can still enjoy the very best of natural light entering your space.

BulletGuard™ is a highly specialised range of products manufactured with the specific purpose of resisting penetration by projectiles discharged from firearms. All products within the BulletGuard™ range are manufactured to meet

the stringent requirements of the Australian and New Zealand Standard AS/NZS2343.

The BulletGuard™ range of products are multiple compositions consisting of glass, highly specialised scratch resistant polycarbonates, polyurethane, specifically developed security interlayers and security films. The components used in the manufacture of BulletGuard™ products retain a high level of light transmission and a high degree of visual integrity following an attack.

One of the keys to the success of BulletGuard™ products is weight. In many applications where bullet resistant glass is required it is preferable to keep weight to a minimum, especially in armoured and defence vehicles. Even in building installation it is preferable to keep weight to a minimum, as additional weight requires additional structural support.

## Considerations

- Allow adequate edge clearance for glazing, normally 6mm all round.
- Allow for a minimum of 15mm edge cover. Viridian recommends 20mm.
- Ensure the frame and supporting structure is strongly constructed to provide adequate protection for the glass. It is most important to consider the weight of the glass used and to provide suitable resistance to penetration to edge attack. The frame and the glass should be considered together as a bullet resistant unit.
- Setting blocks, 6mm minimum, and distance pieces, 2mm minimum, are essential. They must be installed to prevent glass contact with the frame. Avoid glass to metal contact.
- The glazing system must not allow water traps to occur.

With an ever-increasing diversity of product types, complex glass standards and regulatory building code changes, correct product selection is becoming more difficult and ever more important. Please consult with Viridian to discuss specific requirements for BulletGuard™ applications.

## Applications

- Windows
- Doors

## Maximum Size

- 2000mm x 1000mm

## How to Specify

Please consult with Viridian to discuss specific requirements for BulletGuard™ applications

## Performance Data

Attack level	Weapon and calibre	Ammunition	Range	Number of strikes	Weight (kg/m²) approx.
G0/G1	Handgun	10.2g soft point	3m	3	57.84
	357 Magnum	semi-jacketed, flat nose			
G2	Handgun	15.6g soft point	3m	3	70.36
	44mm Magnum	semi-jacketed, flat nose			
S1	Shotgun 12 gauge	12 gauge 70mm	3m	2	93.40
		28.35g single slug			
R1	Rifle 5.56mm	M 193 5.56	10m	3	120.73
	3.6g	3.6 full metal case			
R2	Rifle 7.62mm	NATO standard 7.62mm	10m	3	120.73
		9.3g full metal case			

Notes: Chart based on Standards. The standard defines three broad attack level categories: 1. "G" Resistant to handgun attack. 2. "S" Resistant to shotgun attack. "R" Resistant to rifle attack. R1. Rifle 5.56mm S1. Shotgun 12 gauge G2. Handgun 44 magnum R2. Rifle 7.62mm.

BulletGuard™ is a trademark of Viridian Glass





## PRODUCT

# Bespoke Custom Laminate Solutions

Viridian's bespoke custom lamination capabilities allows us to create a wide range of glass solutions for highly specialised applications.

Depending on your specific project requirements, Viridian can manufacture specific types of laminated glass to application, risk or engineering requirements.

Manufactured in Australia from high quality components, Viridian's custom laminated products are protected by the Viridian Glass Warranty and supported with in house engineering support for certain types of applications.

You can also choose to add extra processes, coatings, speciality interlayers or painted finishes to enhance energy efficiency and acoustic comfort, or add aesthetic and design elements.

## Features and Benefits

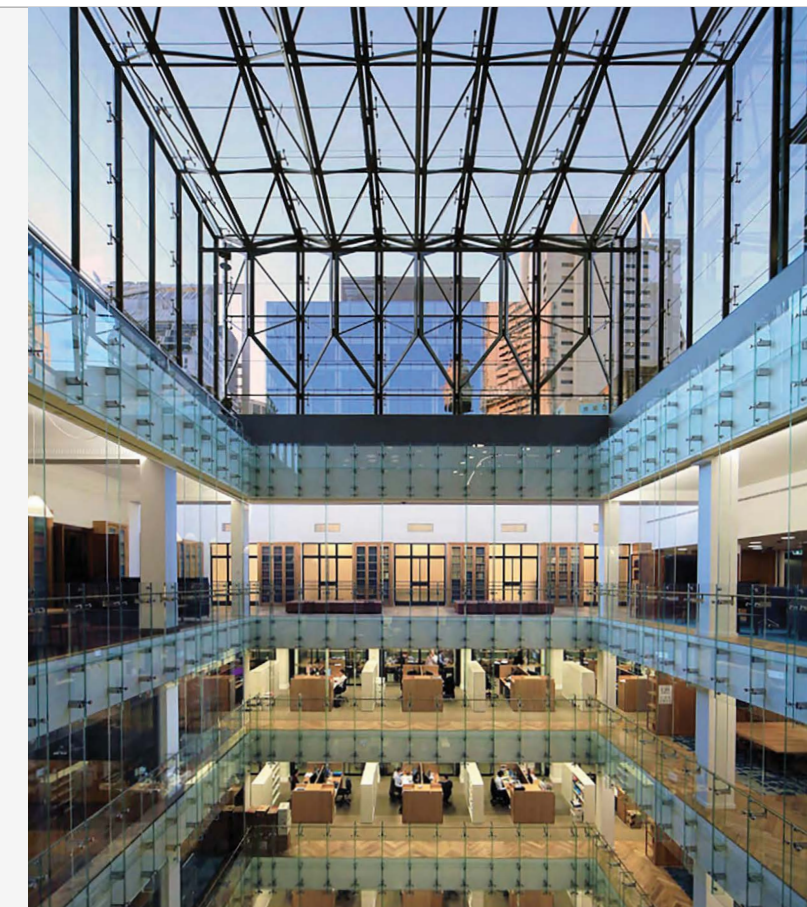
- Viridian offers extensive knowledge and experience that assures high quality and safe products.
- Protected by the Viridian Glass Warranty.
- Options to add benefits to the product to enhance acoustics or energy efficiency for specific requirements.
- May also be able to introduce pattern and colour elements if required for specific design or aesthetic requests.

## Applications

- High security applications
- Defence applications
- Facades
- Balustrades
- Overhead glazing
- Engineered applications

## Maximum Size

Various – Please contact Viridian



## How to Specify

- **Select glass name**  
VLam™ Custom Laminate
- **Nominate thickness**  
9.52mm – 49.56mm
- **Nominate processing**  
Heat Strengthened, Toughened and Heat Soaking
- **Nominate colour**  
Clear, Light Grey, Grey, Green, Bronze, SuperClear™, SuperGreen™
- **Nominate interlayer type and thickness**  
PVB or SGP
- **Nominate performance**  
Low E coated or non-coated single glass or high performance double glazed options





> VIRIDIAN GLASS GUIDE™

# Knowledge

- 
- Sections:**
- Glass Specifications
  - Glass Processing
  - Heat Soak Treatment
  - Cleaning of Glass
  - Standards and Warranties





# Glass Specifications

The Glass Guide™ has been designed to provide a broad range of information relating to glass types, sizes, properties, behaviours and configurations of Viridian's product range. Due to the variety of issues that are unique to each project, Viridian strongly recommends that prior to commencing your project you contact Viridian or your glazing professional and discuss the unique requirements of your project and the sustainability of individual Viridian products and make-ups in specific applications.

There are various key considerations when designing and determining the appropriate glass for an application. These range from the safety requirements and breakage characteristics of the glass type to the aesthetic or energy

performance of the product (see Viridian's TechDirect™ paper on Glass Selection and Terminology on our website). Viridian can help you to determine your glass requirements based on your design, although the design requirement and fitness for purpose falls within the task of the designer.

When requesting assistance with glass specification it makes it easier and quicker for Viridian to reply to your request if the appropriate information is supplied. The following lists the relevant information required for the glass determination in line with Australian Standard AS1288:2021 Glass in Buildings – Selection and Installation.

## Vertical Glazing

- Supply a drawing (elevation and plan)
- Provide wind load – ULS & SLS for area under consideration (if the application is external)
- Panel size – Height (mm) x Width (mm)
- Details of how the panel is supported
- Internal or external application

## Roof Glazing

- Supply a drawing
- Provide wind load – ULS & SLS for roof cladding (different to that used for vertical cladding)
- Live load – determine from AS1170 pt1. If unsure which load is appropriate then consult the Building Surveyor for advice
- Panel size – distance up slope (mm) x distance across slope (mm)
- Angle of panel measured from the horizontal  
Details of how the panel is supported, four edges or two opposite edges
- Advise if the panel is supported on top of the glass as well as under the glass
- Distance above the floor or ground (metres) to the highest point of the glass

## Fin Glazing

- Supply a drawing
- Provide wind load – ULS & SLS
- Panel size – Height (mm) x Width (mm)
- Details of how the panel is supported at top and bottom
- Internal or external application

## Faceted Glazing

- Supply a drawing
- Provide windload – ULS & SLS
- Panel size – Height (mm) x Width (mm)
- Details of how the panel is supported at top and bottom
- Angle between adjacent panels
- Internal or external application

✓ **When requesting assistance with glass specification it makes it easier and quicker for Viridian to reply to your request if the appropriate information is supplied.**

## Balustrade

- Supply a drawing
- Advise difference in level the glass is protecting
- Provide wind load – ULS & SLS
- Live load – determine from AS1170 pt1
- If unsure which load is appropriate then consult the Building Surveyor for advice
- Panel size – Height (mm) x Width (mm)
- Details of how the panel is supported
- Details of how the handrail is supported
- Internal or external application





## Floor Glazing

- Supply a drawing
- Provide wind load – ULS & SLS
- Live load – determine from AS1170 pt1
- If unsure which load is appropriate then consult the Building Surveyor for advice
- Panel size – Height (mm) x Width (mm)
- Details of how the panel is supported
- Internal or external application

## Pool Fence

- Supply a drawing
- Provide wind load – ULS & SLS
- Panel size – Height (mm) x Width (mm)
- Details of how the panel is supported

## Thermal Assessments

Viridian carries out thermal assessments for customers, free of charge. Please see Viridian's TechDirect™ paper on Thermal Stress and Thermal Fracture in Glass on our website.

## Other Considerations

**Haze – Low E coated products** exhibit a natural haze characteristic which may be noticeable when the glass is in direct sun or viewed against a dark background. This is not a fault with the glass but simply a characteristic of the Low E coating.

## How to Specify Clauses

- Solar control glass may be subject to thermal stress and should therefore be thermally assessed prior to installation.
- Heat soaking is a requirement of the Building Code of Australia (BCA) in certain applications. Heat soak treatment is a destructive test, which reduces the likelihood of spontaneous breakage by converting impurities such as nickel sulphide inclusions.
- Heat Strengthening – All glass which requires extra strength and thermal resistance will be heat strengthened. Heat strengthening increases the strength of annealed glass. However it is not a substitute for toughened glass. Heat strengthened glass is not a Grade A safety glass.
- In the event of fracturing, heat strengthened glass will crack and tends to remain in glazed position.
- The glass shall comply with the following performance criteria:
  - Visible Light Transmission %
  - U Value Shading Coefficient (SC)
  - Solar Heat Gain Coefficient (SHGC)
- All glass is to be selected and installed in accordance, but not exclusively, with the following Australian and/or New Zealand Standards
  - Australian Standard AS1288:2021
  - Glass in Buildings Selection and Installation
  - Australian Standard AS1170
  - Minimum Wind loads on Structures
  - AS/NZS2208 Safety Glazing
  - Materials in Buildings
  - AS/4666 Insulating Glass Units
  - AS/NZS4667 Quality Requirements for cut-to-size and Processed Glass





# Glass processing

Most architectural glass will have some form of edgework other than edges that are clean-cut. The types of edge work are summarised on these pages. In addition, there are specialist decorative finishes available that are primarily used for furniture.

The guidelines for toughened safety glass summarise key dimensions and tolerances for holes and notches. Please refer any applications outside these tolerances to Viridian for review.

**Figure 1**

Maximum hole diameter to be less than 50% of narrowest height/width of glass for holes over 75mm. Dog and cat doors attract special rules

Countersunk holes at 45° angle available on 5mm-19mm thickness

Minimum diameter 5mm but not less than thickness of glass

**Figure 4**

Distance between holes to be at least 4 x thickness of glass

**Figure 3**

Holes at corners distance to be 4 x thickness of glass from one edge and at least 1.5 x thickness from other edge. Except where – glass thickness >10mm to be 4 x thickness to both edges and where – angle of corner < 90° to be 4 x thickness to both edges

**Figure 2**

Distance to be 1.5 x thickness of glass up to 10mm glass and 2 x thickness of glass over 10mm for holes at sides



Most architectural glass will have some form of edgework other than edges that are clean-cut.

**Figure 1**

Height/width of cut-out to be no more than 33% of height/width of glass

Minimum radius equals glass thickness at end of cut-out

**Figure 2**

Radius of corners to be equal to the thickness of the glass

Minimum 19mm radius at semi-circle of cut-out

**Figure 6**

Interior width and height of cut-out not to be less than the thickness of the glass

**Figure 5**

Distance between cut-out and edge of glass to be at least 50% of hole/cut-out width or height in the direction in question  
Minimum of 75mm 4-6mm glass  
Minimum of 100mm 8-19mm glass

Corners Rounded

**Figure 4**

Rectangular cut-outs to have a hole radius. Have radius corners or semicircular ends not less than the glass thickness

**Figure 3**

External corners must be rounded



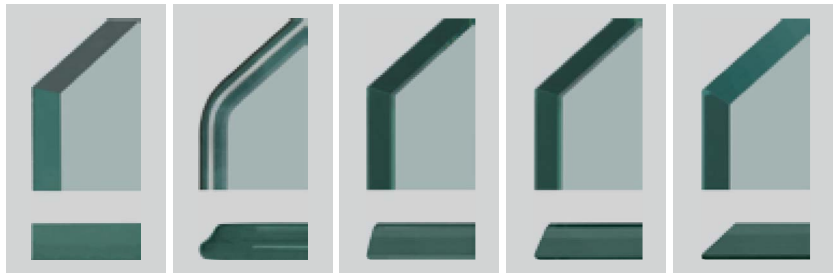
Position of cut-out from edge

- The edge distance must be greater than half of cut-out height
- The edge distance must be greater than half of cut-out width
- The inside of cut-out must have radius corners to a dimension of not less than the thickness of the glass
- Refer to our sales staff for advice

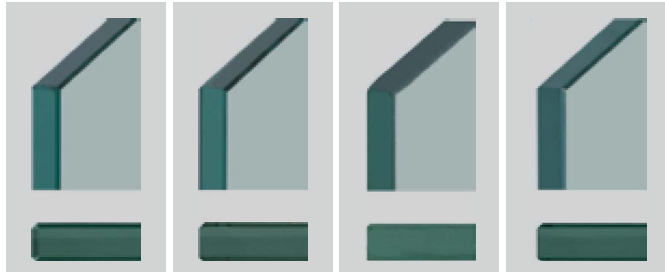
Other points

- In a panel with holes, the minimum width of the panel must be eight times the thickness of the glass
- In a panel of glass where there are a cluster of holes e.g. more than four, please refer to our sales staff for advice

Types of Glass Edge Work



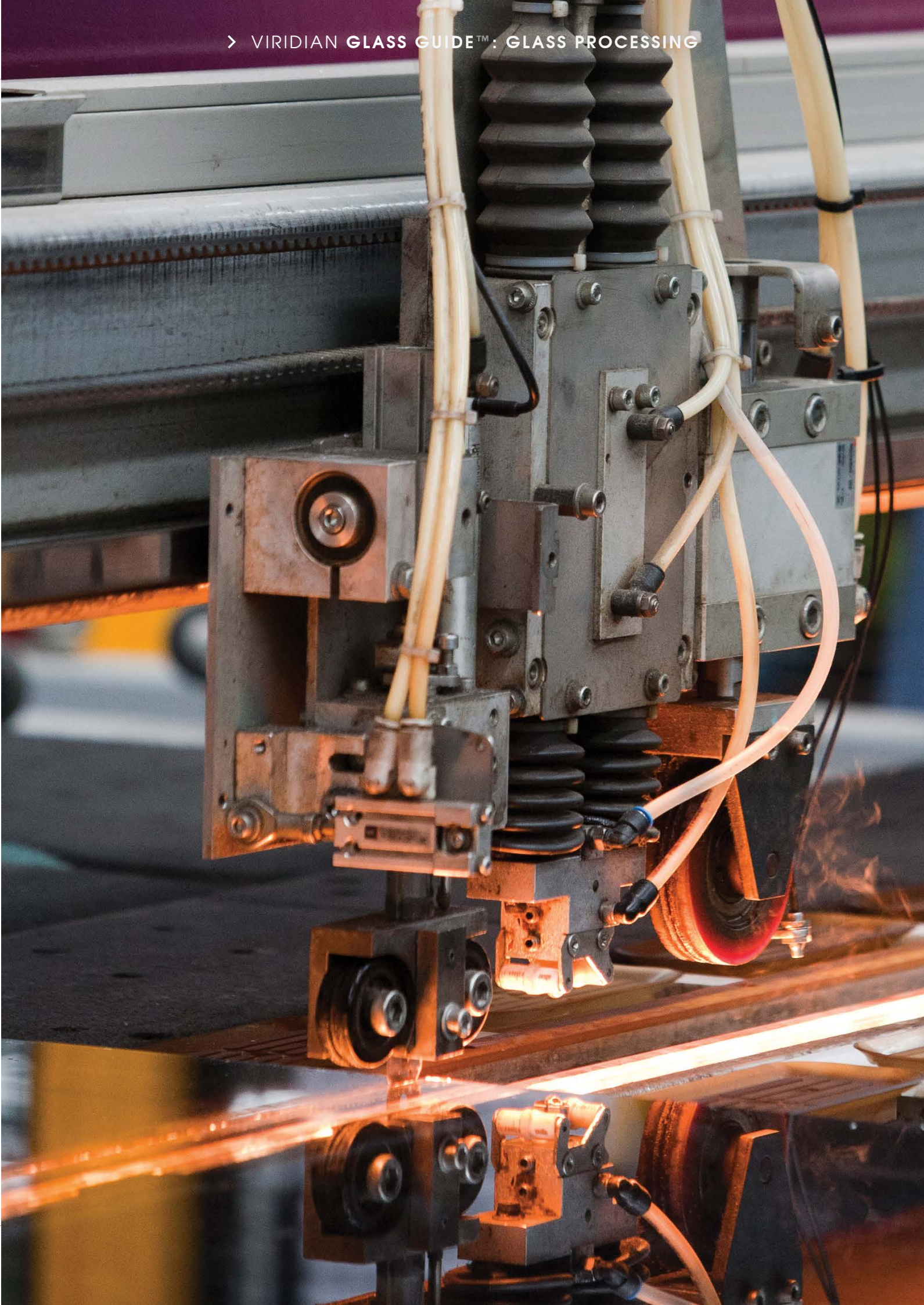
Clean cut Edge   OG-CNC Polished Edge   Polished Edge 15 Black Mitre   Polished Edge 22.5 Black Mitre   Polished Edge 45 Black Mitre



Polished Edge Tip corners   Polished Edge   Rough arrised edge   Smooth edge

✓ Edge Working

Types of glass edge work	Detail	Application
Clean Cut	As cut edges, edges are sharp	General glazing concealed edges
Rough arris	Sharp edges are removed. Minimum edge work for toughened glass	General glazing concealed edges
Flat grind	Machine Ground Edges	Silicone butt joints
Flat polish	Machine polished	Exposed edges and furniture
Mitre	Machine edge - 45mm or 67.5mm	Angled silicone glazing and Exposed angled edges





# Heat soak treatment

Heat soak treatment is a quality control process carried out on Viridian toughened safety glass. It is designed to reject glass panels that may potentially break due to impurities such as nickel sulphide.

Heat soak treatment must be carried out in line with BCA regulations or when toughened glass is specified in structural applications and in locations where safety is paramount.

## Benefits

Heat soak treatment significantly reduces the risk of breakage of installed toughened glass from spontaneous fracture. For building owners, developers and specifiers, heat soak treatment offers a number of benefits.

- Reduces potential public liability
- Low cost compared to glass replacement costs

## Other Considerations and Alternative Products

The breakage characteristics need to be assessed in the selection of toughened glass.

**Laminated safety glass** – the PVB interlayer will restrict glass granules falling.

**Heat strengthened glass** – this provides resistance to thermal breakage and can resist greater loads than annealed glass. Its breakage characteristic means that if large pieces are broken, they often remain in place similar to annealed glass. It is not a safety glass but has reduced potential breakage from nickel sulphide inclusions due to lower stress than toughened glass.

## Technical Outline

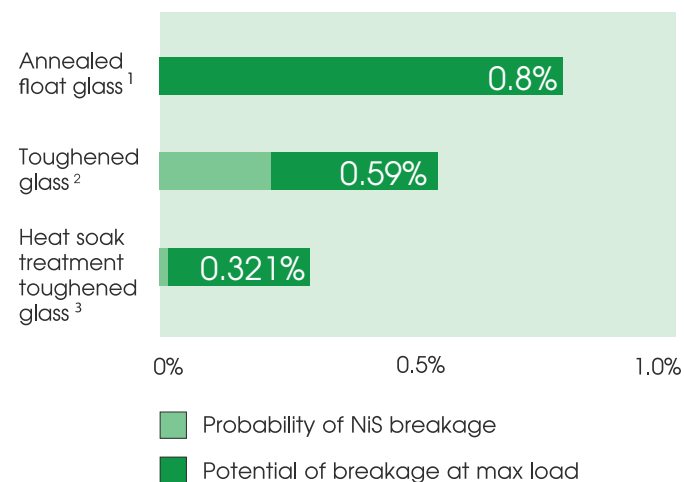
Toughened glass may potentially break from an impurity in the glass called nickel sulphide (NiS). This type of breakage is very rare as most breakages are the result of impact, incorrect glazing or structural movement. The heat soak treatment subjects toughened glass to elevated temperatures for a specific time depending on glass thickness.

The Viridian process is carefully controlled so that the toughened glass maintains its strength.

NiS inclusions can occur in batches and therefore may be more apparent in isolated projects.

The heat soak treatment reduces the risk by eliminating over 95% of the potential breakages due to NiS inclusions.

## ✓ Comparative Potential Breakage



1. Based on 6mm float glass. 2.0kPa wind load, max area. Per Australian Standard AS1288:2021 or New Zealand Standard NZS4223
2. Toughened glass has 2.5 times resistance for equal load and thickness
3. Heat soak treatment 95% NiS conversion







# Cleaning of glass

**This information is offered as general information only. Specific advice on the cleaning of glass should always be sought from a reputable glazier or professional window cleaner before any glass cleaning is undertaken. While Viridian has made every effort to ensure the accuracy and effectiveness of this information, Viridian makes no representation as to the accuracy or effectiveness of the information and takes no responsibility for any loss, damage or injury which may be caused as a direct or indirect result of the use of this information.**

## Recommendation During Construction

It's recommended that glass be protected from the risk of contamination caused by building materials and other exposure risks during construction, this will greatly simplify the glass cleaning task at the end of the project. If the glass cannot be protected during construction then the glass and frames should be cleaned frequently to ensure no permanent damage occurs.

Construction dust, leachate from concrete and rusting from steel can contribute to the formation of mild chemical reactions; this may stain or otherwise damage the surface of glass, voiding warranties.

Temporary screens must be installed if welding, sandblasting, floor sanding, cuffing or other potentially damaging construction practices takes place near the glass. Glass installations which are adjacent to concrete e.g. concrete slab floors require extra care and cleaning due to the abrasive nature of concrete dust.

## Glass Cleaning

Hand cleaning of the glass surface, to visibly remove accumulated dust or fingerprints, can be accomplished using many different glass cleaning products. Only detergents and cleaning solutions which are recommended for cleaning glass should be used.

Refer to our website for more information on recommended products and procedures.

While cleaning ensure jewellery and watches are removed and gloves should be worn to avoid scratching the surface of the glass. Scratches that occur from foreign objects will be permanent and are not repairable. Do everything possible to ensure that the cleaning cloths used are free of any abrasives. Do not use cleaners such as steel wool, scouring bristles or other metallic or abrasive materials as this may scratch the glass.

## Care of Mirrors

Some proprietary glass cleaners, if used to excess, can cause damage to the backing of reflective, painted and coloured glass as can excessive amounts of water. Make certain when cleaning the face of this type of glass that there is no contact with the backing, particularly at the edge of the glass and be careful to keep any moisture off the back of the glass.

## Care of Coated Glass

The coated surface of the glass does clean differently to ordinary glass. Refer to our website for more information.

Do not use razor blades, steel wool, scouring bristles or other metallic or abrasive objects on the coated surface. If metallic objects contact the coated surface, a thin layer of metal removed from the object may be deposited onto the surface which results in a discoloured stain which is difficult to remove using routine cleaning procedures.

## Care of Toughened Glass

The cleaning of toughened glass requires special consideration. The glass surface on the opposite side to the Safety Compliance Stamp may, because of the manufacturing process, have what's called 'pickup' on the surface. 'Pickup' is a deposit of very small particles of glass which are fused on the glass surface. It is important during the cleaning of toughened glass not dislodge these particles, otherwise scratching of the glass surface may result.

The use of a soft cleaning cloth is only recommended on toughened glass as to not dislodge 'pickup'. It is suggested that professional cleaners consult with their suppliers as to the suitability of available cleaning equipment, materials and methods before attempting to clean toughened glass. Some tapes or adhesives can stain or damage glass surfaces. Avoid using such materials unless they are known to be easily removed.

## Spot Cleaning

Occasionally spot cleaning may be required to remove stubborn dirt or foreign materials which adhere to the surface. Spot cleaning products work to remove markings such as grease, oil, tape adhesive, and crayons or other waxy materials as well as paint and rub-off marks from plastics.

## Paint Damage

Paint spots have been traditionally removed using a sharp razor blade or metal scrapers. The use of these items will cause damage to the glass. As an alternative, investigate solvents or graffiti removal materials, ensuring that they will not damage the glass.

## Professional Cleaners

Professional glass cleaners have significant experience and access to specialised equipment, materials and methods which the general public may not. Professional glass cleaners are acknowledged experts in the cleaning of glass, Viridian offers this information as general advice only. Professional glass cleaners should consider the following information as part of the development of their own cleaning processes and procedures if desired.

**Refer to our website for comprehensive cleaning instructions.**



# Standards and Warranties

The following is an outline of key standards relating to glass selection and performance that are referenced throughout this guide. The Building Codes of Australia and New Zealand refer to Australian Standard AS1288 and New Zealand Standard NZS4223 respectively as a deemed to comply document. The Building Codes provisions for energy efficient glazing in each region impact on solar control and thermal insulation glass selection.

## **Australian Standard AS1288 – Glass in buildings – Selection and installation or New Zealand Standard NZS4223 – Glazing in buildings**

Specifies procedures for the design, selection and installation of glass in buildings. Includes guidance for installation practice, based on proven techniques. Design loads including wind load are selected from AS/NZS1170.0, AS/NZS1107.2 or AS4055.

## **AS/NZS2208 – Safety glazing materials in buildings**

Glass that is installed where safety glass is required must be manufactured in accordance with AS/NZS2208. This is the standard that safety glazing materials are product certified to for use in Australia and New Zealand.

## **AS/4666 – Insulating glass units**

This standard sets out the performance requirements and guidelines on the selection and installation of insulating glass units.

## **AS/NZS4667 – Quality requirements for cut to size processed glass**

Sets out the quality requirements for cut sizes of flat, transparent, clear ordinary annealed, tinted heat-absorbing, patterned and wired glass for general glazing and/or further processing.

## **AS/NZS2343 – Bullet resistant panels and elements**

Specifies the requirements for bullet resistant panels and elements according to their performance in preventing penetration by projectiles discharged from firearms under controlled conditions.

## **AS 3959 – Construction of Buildings in Bushfire Prone Areas**

Specifies the minimum construction requirements for each defined Bushfire Attack Level (BAL).

## **AS 1530.8.1 – Tests on elements of construction for buildings exposed to simulated bushfire attack**

The testing procedure by which glazing materials should be measured to enable item to be used in lieu of the relevant BAL as outlined in AS3959. This is relevant for BAL up to and including BAL 40.

## **AS1530.4 – Methods for fire tests on building materials, components and structures**

Fire resistance tests of elements of building construction. This Standard applies to heating conditions, test procedures and criteria for the determination of fire resistance of an element of building construction. In most cases, a single test, carried out in accordance with this Standard establishes the fire resistance for the element of construction concerned.

## **AS/NZS1170 – Structural design actions**

There are four parts which cover general principles; permanent, imposed and other actions; wind actions; snow and ice actions.



## **Viridian Warranties**

Viridian provides comprehensive warranties for products when they are manufactured, sourced and supplied through the Viridian Glass network only. Our national distribution network means that it is easy to contact us should there be a problem.

**Warranty details are available on our website.**





> VIRIDIAN GLASS GUIDE™

# Glass Data

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Sections:      Performance Data  
                     Noise Attenuation Solutions





# Performance Data Tables

Product Name	Nominal Thickness	Visible			Solar		UV Trans	U Value	SHGC	Weight kg/m²	Selectivity
		Trans.	Refl. Out	Refl. In	Trans.	Refl.					
VLam™											
VFloat™ Grey	4	56	6	6	55	6	29	5.9	0.67	10	1.20
▲ 1	▲ 2	▲ 3	▲ 4		▲ 5	▲ 6	▲ 7	▲ 8	▲ 9		▲ 10

**1. Product Name** – refer to product for more information. Where (#2) appears, this identifies the glass’ coated surface that is glazed to the inside of a building or the inside of a ThermoTech™ unit.

**2. Nominal Thickness** – the glass thickness or the makeup of a ThermoTech™ unit. The first number is the outer glass thickness, +12mm gap, then the thickness of the inner panel of the unit. Thickness tolerances are:

3-6mm (±0.2mm) 8-12mm (±0.3mm)

15mm (±0.5mm) 19mm (±1.0mm)

**3. Visible Light Transmission** – percentage of visible light passing directly through the glass. The wave length range for visible light is 380 to 780nm. The higher the percentage the more daylight.

**4. Visible Light Reflection** – percentage of visible light reflected toward the exterior.

**5. Solar Transmission** – percentage of normally incident visible light and solar energy passing directly through the glazing. The wave lengths measured for solar energy is 300 to 2500nm.

**6. Solar Reflection** – percentage of normally incident visible light and solar energy reflected toward the exterior.

**7. UV Transmission** – the percentage of Ultra Violet light transmitted measured in the light range of 300–380nm. The lower the number the better.

**8. U Value – Thermal Conductivity** – measurement unit is watts per m2 per degree celcius (W/m2°C) and is a measure of the rate of heat gain or loss through glazing due to environmental differences between outdoor and indoor air.\*

**9. Solar Heat Gain Coefficient (SHGC)** – the proportion of total solar radiation that is transferred through the glass at normal incidence. It comprises the direct solar transmission (5) and the part of the solar absorption dissipated inwards by radiation and convection. The lower the number the better the solar performance.\*

**10. Selectivity** - High selective glasses, generally above 1.8 offer exceptional performance which provides some of the best energy savings through the lowest conductance (U Values) and best solar control (SHGC), high visible light transmission assists in the requirement for less artificial lighting during daylight hours.

Glass selectivity is an index that reports the relationship between visible light transmission and solar heat gain, it is measured as an index ( $S = Vt/g$ ) with a high selectivity more preferable in modern building design.

**Note:** Data is based on laboratory spectrophotometric measurements and produced using Windows software for AFRC 100-2010 conditions, which is the internationally recognised method for describing glass performance. The data is glass only and care should be exercised when evaluating manufacturer’s published data that the same environmental conditions have been used.

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# Glass Performance: Single Glazing

Product Name	Nominal Thickness	Visible			Solar		UV Trans	U Value	SHGC	Weight kg/m²	Selectivity
		Trans.	Refl. Out	Refl. In	Trans.	Refl.					
VFloat™											
Clear	4	89	8	8	82	8	67	5.9	0.85	10	1.05
	5	89	8	8	79	7	63	5.9	0.83	12.5	1.07
	6	88	8	8	78	7	60	5.8	0.82	15	1.07
	8	86	8	8	71	7	56	5.7	0.78	20	1.10
	10	85	8	8	67	7	52	5.7	0.75	25	1.13
	12	84	8	8	64	7	48	5.6	0.73	30	1.15
	15	84	8	8	65	7	47	5.5	0.76	37.5	1.11
	19	82	8	8	61	6	43	5.4	0.72	47.5	1.14
Light Grey	6	61	6	7	54	6	31	5.8	0.66	15	0.92
Grey	4	56	6	6	55	6	29	5.9	0.67	10	0.84
	5	50	5	5	53	5	27	5.8	0.66	12.5	0.76
	6	42	5	5	42	5	19	5.8	0.58	15	0.72
	10	26	4	4	28	4	10	5.7	0.50	25	0.52
	12	21	4	4	25	5	9	5.6	0.47	30	0.45
Green	4	82	8	8	58	6	36	5.9	0.69	10	1.19
	5	77	7	7	47	6	20	5.8	0.62	12.5	1.24
	6	75	7	7	44	6	26	5.8	0.59	15	1.27
	10	66	6	6	31	5	15	5.7	0.52	25	1.27
Bronze	4	61	7	7	60	6	28	5.9	0.70	10	0.87
	5	56	6	6	57	6	24	5.8	0.69	12.5	0.81
	6	51	5	5	52	5	19	5.8	0.65	15	0.78
	10	34	5	5	36	5	9	5.7	0.55	25	0.62
VFloat™ SuperClear™											
Super-Clear™	4	91	9	9	90	8	78	5.9	0.90	10	1.01
	6	91	9	9	88	8	74	5.8	0.89	15	1.02
	8	90	9	9	87	8	71	5.7	0.88	20	1.02
	10	90	9	9	86	8	66	5.7	0.88	25	1.02
	12	90	9	9	86	8	66	5.6	0.88	30	1.02
	15	90	9	9	83	8	57	5.5	0.86	37.5	1.05
	19	90	9	9	82	8	54	5.4	0.85	47.5	1.06

Product Name	Nominal Thickness	Visible			Solar		UV Trans	U Value	SHGC	Weight kg/m²	Selectivity
		Trans.	Refl. Out	Refl. In	Trans.	Refl.					
SuperTones™											
Super-Green™	6	67	6	6	34	5	13	5.8	0.53	15	1.26
SuperGrey™	6	9	4	4	8	4	1	5.8	0.36	15	0.25
SuperBlue™	6	53	6	6	33	5	20	5.8	0.52	15	1.02
	10	41	5	5	22	5	13	5.7	0.45	25	0.91
VLam™											
Clear	6.38	87	8	8	72	7	<1	5.7	0.79	15.4	1.10
	8.38	87	8	8	72	7	<1	5.7	0.78	20.4	1.12
	10.38	86	8	8	66	7	<1	5.6	0.74	25.4	1.16
	12.38	85	8	8	65	7	<1	5.6	0.74	30.4	1.15
Grey	6.38	42	5	5	47	6	<1	5.7	0.62	15.4	0.68
	8.38	42	5	5	46	5	<1	5.7	0.62	20.4	0.68
	10.38	41	5	5	42	5	<1	5.6	0.59	25.4	0.69
	12.38	41	5	5	41	5	<1	5.6	0.58	30.4	0.71
Green	6.38	71	7	7	63	6	<1	5.7	0.72	15.4	0.99
	8.38	71	7	7	62	6	<1	5.7	0.72	20.4	0.99
	10.38	70	7	7	57	6	<1	5.6	0.69	25.4	1.01
	12.38	69	7	7	56	6	<1	5.6	0.68	30.4	1.01
Bronze	6.38	52	6	6	51	6	<1	5.7	0.64	15.4	0.81
	8.38	52	6	6	50	6	<1	5.7	0.64	20.4	0.81
	10.38	51	6	6	46	5	<1	5.7	0.61	25.4	0.84
	12.38	51	6	6	45	5	<1	5.6	0.61	30.4	0.84
Super-Green™	6.38	64	6	6	30	5	<1	5.7	0.50	15.4	1.28
	10.38	65	6	6	31	5	<1	5.6	0.51	25.4	1.27
	12.38	64	6	6	30	5	<1	5.6	0.51	30.4	1.25
VLam™ Translucent											
Translucent	6.38	68	7	7	59	6	<1	5.7	0.70	15.4	0.97
	8.38	67	7	7	59	6	<1	5.7	0.70	20.4	0.96
	10.38	66	7	7	54	6	<1	5.6	0.67	25.4	0.99
	12.38	66	7	7	53	6	<1	5.6	0.66	30.4	1.00
Translucent SuperClear™	10.38	70	7	7	69	7	<1	5.6	0.77	25.4	0.91
	12.38	70	7	7	68	7	<1	5.6	0.76	30.4	0.92
Translucent Grey	6.76	32	5	5	38	5	<1	5.7	0.56	15.8	0.57



Product Name	Nominal Thickness	Visible			Solar		UV Trans	U Value	SHGC	Weight kg/m²	Selectivity
		Trans.	Refl. Out	Refl. In	Trans.	Refl.					
VLam™ Hush											
Clear	6.5	87	8	8	71	7	<1	5.7	0.78	15.5	1.12
	8.5	87	8	8	71	7	<1	5.7	0.78	20.5	1.12
	10.5	85	8	8	65	7	<1	5.6	0.74	25.5	1.15
	12.5	85	8	8	64	6	<1	5.5	0.73	30.5	1.16
Grey	6.88	42	5	5	45	5	<1	5.7	0.61	15.9	0.69
	10.88	41	5	5	42	5	<1	5.5	0.58	20.9	0.71
	12.88	41	5	5	40	5	<1	5.5	0.58	30.9	0.71
Translucent	6.88	68	7	7	58	6	<1	5.7	0.69	15.9	0.99
	10.88	66	7	7	53	6	<1	5.5	0.66	20.9	1.00
	12.88	66	7	7	52	6	<1	5.5	0.65	30.9	1.02
EVantage™											
Clear (#2)	6	68	23	26	59	17	30	3.8	0.63	15	1.08
Grey (#2)	6	32	10	27	29	8	10	3.8	0.42	15	0.76
Bronze (#2)	6	38	11	27	35	10	11	3.8	0.46	15	0.83
Blue-Green¹ (#2)	6	56	19	27	35	11	16	3.8	0.46	15	1.22
Super-Green™ (#2)	6	49	16	27	24	9	8	3.8	0.38	15	1.29
SuperBlue¹ (#2)	6	39	12	27	23	8	10	3.8	0.37	15	1.05
SmartGlass™											
SP 10 Clear (#2)	4	83	11	11	68	11	54	3.7	0.72	10	1.15
	6	81	11	12	65	10	48	3.6	0.70	15	1.16
SP 30 Neutral (#2)	4	61	8	10	46	8	44	3.7	0.54	10	1.13
	6	63	9	10	45	8	41	3.7	0.54	15	1.17
SP 35 Grey (#2)	4	50	7	9	45	7	21	3.7	0.54	10	0.93
	6	40	6	9	37	7	16	3.7	0.48	15	0.83
SolTech™											
Neutral (#2)	4	61	8	10	46	8	44	3.7	0.54	10	1.13
	6	63	9	10	45	8	41	3.7	0.54	15	1.17
	10	62	8	10	43	8	39	3.6	0.53	36	1.17
Grey(#2)	6	30	6	8	24	6	13	3.7	0.37	15	0.81

Product Name	Nominal Thickness	Visible			Solar		UV Trans	U Value	SHGC	Weight kg/m²	Selectivity
		Trans.	Refl. Out	Refl. In	Trans.	Refl.					
EnergyTech™											
Clear (#2)	4	83	11	11	68	11	54	3.7	0.72	10	1.15
	5	82	11	12	67	11	52	3.7	0.71	12.5	1.15
	6	81	11	12	65	10	48	3.6	0.70	15	1.16
	8	81	10	11	66	10	50	3.6	0.70	20	1.16
	10	79	11	12	60	9	43	3.6	0.66	25	1.20
	12	79	10	11	56	8	42	3.6	0.63	31	1.25
Light Grey (#2)	6	57	8	9	45	8	27	3.7	0.54	15	1.06
Grey(#2)	4	50	7	9	45	7	21	3.7	0.54	10	0.93
	6	40	6	9	37	7	16	3.7	0.48	15	0.83
Super-Clear™ (#2)	6	83	11	12	75	12	68	3.7	0.77	15	1.08
Super-Green™ (#2)	6	61	8	10	28	6	12	3.7	0.41	15	1.49
ComfortPlus™											
Clear (#4)	6..38	82	10	11	64	9	<1	3.6	0.69	15.4	1.19
	8..38	81	11	11	61	9	<1	3.6	0.66	20.4	1.23
	10.38	79	11	12	57	9	<1	3.6	0.63	25.4	1.25
	12.38	79	10	11	55	8	<1	3.5	0.62	30.4	1.27
Light Grey (#4)	6.38	54	7	9	47	7	<1	3.6	0.56	15.4	0.96
	10.38	53	7	9	43	7	<1	3.6	0.53	25.4	1.00
Neutral (#4)	6.38	59	7	9	42	7	<1	3.6	0.52	15.4	1.13
	8.38	60	8	10	41	7	<1	3.6	0.51	20.4	1.18
	10.38	62	8	10	40	7	<1	3.6	0.51	25.4	1.22
	12.38	61	8	10	39	7	<1	3.5	0.49	30.4	1.24
Grey (#4)	6.38	39	6	9	40	7	<1	3.6	0.50	15.4	0.78
	8.38	39	6	9	38	7	<1	3.6	0.49	20.4	0.80
	10.38	38	6	9	35	6	<1	3.6	0.47	25.4	0.81
	12.38	38	6	9	34	6	<1	3.5	0.46	30.4	0.83
Green (#4)	6.38	71	9	11	41	7	<1	3.6	0.51	15.4	1.39
	10.38	65	8	10	32	6	<1	3.6	0.44	25.4	1.48
	12.38	59	8	10	26	5	<1	3.5	0.40	30.4	1.48
Bronze (#4)	6.38	49	7	9	43	7	<1	3.6	0.53	15.4	0.92
	10.38	47	7	9	40	7	<1	3.6	0.50	25.4	0.94
Translucent (#4)	6.38	63	8	10	51	8	<1	3.6	0.59	15.4	1.07
	10.38	62	8	10	47	7	<1	3.6	0.56	15.4	1.11



Product Name	Nominal Thickness	Visible			Solar		UV Trans	U Value	SHGC	Weight kg/m²	Selectivity
		Trans.	Refl. Out	Refl. In	Trans.	Refl.					
ComfortHush™											
Clear (#4)	6.5	81	11	11	62	9	<1	3.6	0.67	15.5	1.21
	10.5	80	10	11	57	9	<1	3.6	0.64	25.5	1.25
Neutral (#4)	6.5	60	8	10	42	7	<1	3.6	0.52	15.5	1.15
	10.5	59	8	10	38	7	<1	3.6	0.49	25.5	1.20
Grey (#4)	6.88	39	6	9	39	6	<1	3.6	0.50	15.9	0.78
	10.88	38	6	9	35	6	<1	3.5	0.47	25.9	0.81
Translucent (#4)	6.88	63	8	10	51	7	<1	3.6	0.59	15.9	1.07
	10.88	62	8	10	46	7	<1	3.6	0.56	25.9	1.11
IntruderGuard™											
Clear	7.52	86	7	7	69	6	<1	5.6	0.77	16.6	1.12
Grey	7.52	42	5	5	44	5	<1	5.6	0.60	16.6	0.70
AssaultGuard™											
Clear	9.52	87	8	8	69	7	<1	5.5	0.77	21.6	1.13
	11.52	86	8	8	63	6	<1	5.5	0.73	26.6	1.18
	13.52	84	7	7	61	6	<1	5.4	0.72	31.6	1.17
AssaultGuard™ Ultra											
Clear	10	86	8	8	67	7	<1	5.4	0.75	22.2	1.15
	12	85	8	8	63	7	<1	5.3	0.73	27.2	1.16
	14	84	8	8	60	6	<1	5.3	0.71	32.2	1.18
AssaultGuard™ Ultra E											
Clear	10	81	11	11	60	9	<1	3.5	0.67	22.2	1.21
Neutral	10	60	8	10	41	7	<1	3.5	0.51	22.2	1.18
Green	10	73	9	10	42	6	<1	3.5	0.53	22.2	1.38
Grey	10	49	7	9	38	6	<1	3.5	0.50	22.2	0.98
Clear	12	79	11	11	56	8	<1	3.4	0.64	27.2	1.23
Neutral	12	62	9	10	40	7	<1	3.4	0.51	27.2	1.22
Green	12	71	9	11	41	6	<1	3.4	0.51	27.2	1.39
Grey	12	69	7	9	37	6	<1	3.4	0.48	27.2	1.44
Clear	14	77	10	11	53	8	<1	3.4	0.61	32.2	1.26
Neutral	14	60	8	9	37	6	<1	3.4	0.49	32.2	1.22
Green	14	67	9	10	34	6	<1	3.4	0.46	32.2	1.46
Grey	14	36	6	9	28	5	<1	3.4	0.42	32.2	0.86

Product Name	Nominal Thickness	Visible			Solar		UV Trans	U Value	SHGC	Weight kg/m²	Selectivity
		Trans.	Refl. Out	Refl. In	Trans.	Refl.					
JailGuard™											
JailGuard™ 10	18	79	8	8	49	6	<1	4.7	0.65	44.0	1.22
JailGuard™ 20	23	86	8	8	65	7	<1	5.3	0.74	29.8	1.16
JailGuard™ 30	23	79	8	8	49	6	<1	4.7	0.65	44.0	1.22
JailGuard™ E											
JailGuard™ 10 E Clear	18	75	10	11	50	7	< 1	3.1	0.60	27.8	1.26
JailGuard™ 20 E Clear	23	72	10	11	44	7	< 1	3.1	0.55	40.3	1.31
JailGuard™ 30 E Clear	23	72	10	11	45	7	< 1	3.0	0.56	35.4	1.28
JailGuard™ 10 E Neutral	18	58	8	9	36	6	< 1	3.2	0.49	27.8	1.19
JailGuard™ 20 E Neutral	23	56	8	9	31	6	< 1	3.1	0.46	40.3	1.22
JailGuard™ 30 E Neutral	23	56	8	9	32	6	< 1	3.0	0.47	35.4	1.19





# Glass Performance: Insulated Glazing

## ThermoTech™

Outside Glass	Inside Glass	Nominal Thickness	Visible			Solar		UV Trans	U Value	SHGC	Weight kg/m²	Selectivity
			Trans.	Refl. Out	Refl. In	Trans.	Refl.		Argon			
ThermoTech™ Clear												
VFloat™ Clear	VFloat™ Clear	4+12+4	80	15	15	69	13	51	2.6	0.75	20	1.07
		5+12+5	79	15	15	63	12	47	2.5	0.72	25	1.10
		6+12+6	78	15	15	62	12	44	2.5	0.71	30	1.10
		8+12+6	77	14	14	57	11	42	2.5	0.66	35	1.17
		10+12+6	76	14	14	54	10	39	2.5	0.64	40	1.19
		12+12+6	75	14	14	51	10	37	5.0	0.61	45	1.23
VLam™ Clear	VFloat™ Clear	6.38+12+6	78	15	15	58	12	<1	2.5	0.67	30.4	1.16
ThermoTech™ Grey												
VFloat™ Light Grey	VFloat™ Clear	6+12+6	54	9	13	43	8	25	2.5	0.54	30	1.00
VFloat™ Grey	VFloat™ Clear	4+12+4	50	8	13	46	8	24	2.6	0.55	20	0.91
		5+12+5	42	7	12	38	7	19	2.5	0.49	25	0.86
		6+12+6	37	7	12	33	7	15	2.5	0.45	30	0.82
		10+12+6	23	5	12	22	5	8	2.5	0.38	40	0.61
		12+12+6	19	5	12	20	5	7	2.5	0.34	45	0.56
VLam™ Grey	VFloat™ Clear	6.38+12+6	37	7	12	36	7	<1	2.5	0.49	30.4	0.76
SuperGrey™	VFloat™ Clear	6+12+6	8	4	11	6	4	1	2.5	0.21	30	0.38
Green ThermoTech™												
VFloat™ Green	VFloat™ Clear	4+12+4	73	13	14	49	9	30	2.6	0.58	20	1.26
		5+12+5	68	12	14	39	8	17	2.5	0.50	25	1.36
		6+12+6	66	12	14	36	8	21	2.5	0.47	30	1.40
		10+12+6	59	10	13	27	6	12	2.5	0.39	40	1.51
VLam™ Green	VFloat™ Clear	6.38+12+6	63	11	14	50	9	<1	2.5	0.61	30.4	1.03
SuperGreen™	VFloat™ Clear	6+12+6	59	10	13	28	6	10	2.5	0.40	30	1.48
VLam™ SuperGreen™	VFloat™ Clear	6.38+12+6	57	10	13	25	7	<1	2.5	0.37	30.4	1.54

Outside Glass	Inside Glass	Nominal Thickness	Visible			Solar		UV Trans	U Value	SHGC	Weight kg/m²	Selectivity
			Trans.	Refl. Out	Refl. In	Trans.	Refl.		Argon			
ThermoTech™ Blue												
SuperBlue™	VFloat™ Clear	6+12+6	47	8	13	27	6	16	2.5	0.39	30	1.21
		10+12+6	36	7	12	18	5	10	2.5	0.32	40	1.13
ThermoTech™ Bronze												
VFloat™ Bronze	VFloat™ Clear	4+12+4	55	10	13	50	9	23	2.5	0.59	20	0.93
		5+12+5	48	8	13	41	7	18	2.5	0.53	25	0.91
		6+12+6	45	8	12	41	7	15	2.5	0.53	30	0.85
		10+12+6	30	6	12	28	6	7	2.5	0.41	40	0.73
VLam™ Bronze	VFloat™ Clear	6.38+12+6	46	8	13	40	8	<1	2.5	0.52	30.4	0.88
ThermoTech™ Translucent												
VLam™ Translucent	VFloat™ Clear	6.38+12+6	60	11	14	47	9	<1	2.5	0.58	30.4	1.03
VLam™ Translucent Grey	VFloat™ Clear	6.76+12+6	29	6	12	30	6	<1	2.5	0.43	30.8	0.67





# Glass Performance: Insulated Low E

## ThermoTech™ Low E

Outside Glass	Inside Glass	Nominal Thickness	Visible			Solar		UV Trans	U Value Argon	SHGC	Weight kg/m²	Selectivity
			Trans.	Refl. Out	Refl. In	Trans.	Refl.					
ThermoTech™ E Clear												
VFloat™ Clear	EnergyTech™ Clear	4+12+4	74	18	17	57	16	41	1.6	0.71	20	1.04
		5+12+4	74	17	17	55	15	40	1.6	0.68	22.5	1.09
		6+12+6	73	17	16	52	15	35	1.6	0.67	30	1.09
		8+12+6	71	17	16	48	13	34	1.6	0.62	35	1.15
		10+12+6	70	17	16	46	13	32	1.6	0.59	40	1.19
		12+12+6	69	16	16	44	12	30	1.6	0.57	45	1.21
VLam™ Clear	EnergyTech™ Clear	6.38+12+6	72	17	16	50	13	<1	1.6	0.74	30.4	0.97
EnergyTech™ Clear	VFloat™ Clear	4 + 12 + 4	75	17	18	57	15	41	1.6	0.64	20	1.17
		6 + 12 + 6	73	16	17	52	14	36	1.6	0.62	30	1.18
		8 + 12 + 6	72	16	17	52	13	36	1.6	0.62	35	1.16
		10 + 12 + 6	71	16	17	48	12	32	1.6	0.57	40	1.25
EnergyTech™ Clear	EnergyTech™ Clear	4 + 12 + 4	69	19	19	51	16	34	1.5	0.62	20	1.11
		6 + 12 + 6	67	19	19	47	15	29	1.5	0.59	30	1.14
		8 + 12 + 6	67	18	18	47	15	29	1.5	0.59	35	1.14
		10 + 12 + 6	65	18	19	43	13	26	1.5	0.55	40	1.18
EnergyTech™ SuperClear™	SuperClear™	6 + 12 + 6	76	17	18	67	17	53	1.6	0.70	30	1.09
EnergyTech™ SuperClear™	EnergyTech™ SuperClear™	6 + 12 + 6	70	19	19	60	18	47	1.5	0.67	30	1.04
ComfortPlus™ Clear	VFloat™ Clear	6.38+12+6	73	16	17	51	12	<1	1.6	0.60	30.4	1.22
		8.38+12+6	72	16	17	49	12	<1	1.6	0.58	35.4	1.24
		10.38+12+6	71	16	17	47	11	<1	1.6	0.55	40.4	1.29
		12.38+12+6	70	16	17	45	11	<1	1.6	0.54	45.4	1.30
ComfortPlus™ Clear	EnergyTech™ Clear	6.38+12+6	68	18	18	45	14	<1	1.5	0.58	30.4	1.17
		8.38+12+6	67	18	18	43	13	<1	1.5	0.55	35.4	1.22
		10.38+12+6	65	18	19	41	12	<1	1.5	0.52	40.4	1.25
		12.38+12+6	65	18	18	40	12	<1	1.5	0.51	45.4	1.27
ComfortHush™ Clear	VFloat™ Clear	6.5+12+6	72	16	17	50	12	<1	1.6	0.59	30.5	1.22
		10.5+12+6	71	16	17	46	11	<1	1.6	0.55	40.5	1.29
ComfortHush™ Clear	EnergyTech™	6.5+12+6	67	18	18	44	14	<1	1.5	0.57	30.5	1.18
		10.5+12+6	66	18	18	41	12	<1	1.5	0.53	40.5	1.25
EVantage™ Clear	VFloat™ Clear	6+12+6	61	27	29	47	20	23	1.7	0.56	30	1.09
EVantage™ Clear	EnergyTech™ Clear	6+12+6	57	29	29	41	21	19	1.5	0.54	30	1.06

Outside Glass	Inside Glass	Nominal Thickness	Visible			Solar		UV Trans	U Value	SHGC	Weight kg/m²	Selectivity
			Trans.	Refl. Out	Refl. In	Trans.	Refl.		Argon			
ThermoTech™ Neutral												
SolTech™ Neutral	VFloat™ Clear	4 + 12 + 4	55	12	16	38	10	34	1.6	0.46	20	1.20
		6 + 12 + 6	56	12	16	36	10	30	1.6	0.45	30	1.24
		10 + 12 + 6	55	11	16	35	10	29	1.6	0.44	40	1.25
SolTech™ Neutral	EnergyTech™ Clear	4 + 12 + 4	51	13	18	34	11	28	1.5	0.44	20	1.16
		6 + 12 + 6	52	13	17	33	11	24	1.5	0.43	30	1.21
		10 + 12 + 6	51	13	17	31	10	23	1.5	0.42	40	1.21
ComfortPlus™ Neutral	VFloat™ Clear	6.38+12+6	52	10	16	34	9	<1	1.6	0.43	35.4	1.21
		8.38+12+6	53	11	16	33	9	<1	1.6	0.42	30.4	1.26
ComfortPlus™ Neutral	EnergyTech™ Clear	6.38+12+6	49	12	17	31	9	<1	1.5	0.41	30.5	1.20
		8.38+12+6	49	12	17	30	9	<1	1.5	0.40	35.4	1.23
ComfortHush™ Neutral	VFloat™ Clear	6.5+12+6	53	11	16	34	9	<1	1.6	0.43	30.5	1.23
		10.5+12+6	53	11	16	31	8	<1	1.6	0.40	40.5	1.33
ComfortHush™ Neutral	EnergyTech™ Clear	6.5+12+6	49	12	17	31	9	<1	1.5	0.41	30.5	1.20
		10.5+12+6	49	12	17	28	9	<1	1.5	0.38	40.5	1.29
ThermoTech™ Grey												
VFloat™ Light Grey	EnergyTech™ Clear	6+12+6	50	11	15	36	9	20	1.5	0.49	30	1.02
EnergyTech™ Light Grey	VFloat™ Clear	6+12+6	51	10	15	36	9	22	1.7	0.45	30	1.13
VFloat™ Grey	EnergyTech™ Clear	4+12+4	46	9	15	38	10	20	1.6	0.50	20	0.92
		5+12+4	39	8	14	32	9	16	1.6	0.44	22.5	0.89
		6+12+6	34	7	14	27	8	12	1.6	0.40	30	0.85
		10+12+6	21	5	14	18	6	6	1.6	0.30	40	0.70
		12+12+6	17	5	14	16	6	6	1.6	0.28	45	0.61
VLam™ Grey	EnergyTech™ Clear	6.38+12+6	34	7	14	30	8	<1	1.6	0.44	30.4	0.77
EnergyTech™ Grey	VFloat™ Clear	4 + 12 + 4	45	9	15	38	9	18	1.6	0.45	20	1.00
		6 + 12 + 6	35	8	16	29	8	13	1.7	0.39	30	0.90
EnergyTech™ Grey	EnergyTech™ Clear	4 + 12 + 4	42	10	17	33	10	15	1.5	0.43	20	0.98
		6 + 12 + 6	33	8	17	26	8	10	1.5	0.36	30	0.92
SolTech™ Grey	VFloat™ Clear	6 + 12 + 6	27	6	14	19	6	11	1.6	0.28	30	0.96
SolTech™ Grey	EnergyTech™ Clear	6 + 12 + 6	25	7	16	17	7	8	1.5	0.26	30	0.96
ComfortPlus™	VFloat™ Clear	6.38+12+6	35	7	15	30	8	<1	1.6	0.4	30.9	0.88
		10.38+12+6	34	7	15	28	7	<1	1.6	0.38	40.9	0.89
ComfortPlus™ Grey	EnergyTech™ Clear	6.38+12+6	32	8	17	27	8	<1	1.5	0.38	30.9	0.84
		10.38+12+6	31	8	17	24	7	<1	1.5	0.36	40.9	0.86
Comfor- tHush™ Grey	VFloat™ Clear	6.88+12+6	35	7	15	30	8	<1	1.6	0.4	30.9	0.88
		10.88+12+6	34	7	15	28	7	<1	1.6	0.38	40.9	0.89
ComfortHush™ Grey	EnergyTech™ Clear	6.88+12+6	32	8	17	27	8	<1	1.5	0.38	30.9	0.84
		10.88+12+6	31	8	17	24	7	<1	1.5	0.36	40.9	0.86



Outside Glass	Inside Glass	Nominal Thickness	Visible			Solar		UV Trans	U Value	SHGC	Weight kg/m²	Selectivity
			Trans.	Refl. Out	Refl. In	Trans.	Refl.		Argon			
ThermoTech™ Grey												
EVantage™ Grey	VFloat™ Clear	6+12+6	29	10	30	24	9	8	1.7	0.33	30	0.88
EVantage™ Grey	EnergyTech™ Clear	6+12+6	27	11	29	20	9	7	1.5	0.31	30	0.87
SuperGrey™	EnergyTech™ Clear	6+12+6	7	4	13	5	4	1	1.6	0.14	30	0.50
ThermoTech™ Green												
VFloat™ Green	EnergyTech™ Clear	4+12+4	68	15	16	41	11	24	1.6	0.52	20	1.31
		5+12+4	64	14	16	34	9	14	1.6	0.44	22.5	1.45
		6+12+6	61	14	16	31	9	17	1.6	0.42	30	1.45
		10+12+6	52	11	15	21	7	7	1.6	0.31	40	1.68
VLam™ Green	EnergyTech™ Clear	6.38+12+6	59	13	16	42	11	<1	1.6	0.56	30.4	1.05
EnergyTech™ Green	VFloat™ Clear	4 + 12 + 4	68	15	17	41	10	25	1.6	0.48	20	1.42
EnergyTech™ Green	EnergyTech™ Clear	4 + 12 + 4	63	17	18	37	11	20	1.5	0.46	20	1.37
Super-Green™	EnergyTech™ Clear	4+12+4	61	13	15	31	8	15	1.6	0.41	20	1.49
		5+12+4	59	12	15	28	8	12	1.6	0.38	22.5	1.55
		6+12+6	55	12	15	24	7	8	1.6	0.34	30	1.62
Super-Green™	EnergyTech™ Clear	6.38+12+6	54	11	15	23	7	<1	1.6	0.33	30.4	1.64
EVantage™ SuperGreen™	VFloat™ Clear	6+12+6	44	18	30	21	9	7	1.7	0.29	30	1.52
EVantage™ SuperGreen™	EnergyTech™ Clear	6+12+6	41	19	29	18	10	5	1.5	0.27	30	1.52
EnergyTech™ SuperGreen™	VFloat™ Clear	4 + 12 + 4	61	13	17	32	8	15	1.6	0.39	20	1.56
		6 + 12 + 6	54	11	16	24	7	10	1.6	0.32	30	1.69
EnergyTech™ SuperGreen™	EnergyTech™ Clear	4 + 12 + 4	57	14	18	28	9	12	1.5	0.37	20	1.54
		6 + 12 + 6	50	13	18	22	8	8	1.5	0.3	30	1.67
ThermoTech™ Blue												
SuperBlue™	EnergyTech™ Clear	6+12+6	43	9	15	23	7	13	1.6	0.33	30	1.30
		10+12+6	34	7	14	16	6	8	1.6	0.25	40	1.36
EVantage™ SuperBlue™	VFloat™ Clear	6+12+6	35	13	30	19	9	8	1.7	0.28	30	1.25
EVantage™ SuperBlue™	EnergyTech™ Clear	6+12+6	33	14	29	17	9	7	1.5	0.26	30	1.27
EVantage™ Blue-Green	VFloat™ Clear	6+12+6	51	21	30	29	12	13	1.7	0.38	30	1.34
EVantage™ Blue-Green	EnergyTech™ Clear	6+12+6	47	22	29	26	13	10	1.5	0.35	30	1.34

Outside Glass	Inside Glass	Nominal Thickness	Visible			Solar		UV Trans	U Value	SHGC	Weight kg/m²	Selectivity
			Trans.	Refl. Out	Refl. In	Trans.	Refl.		Argon			
ThermoTech™ Bronze												
VFloat™ Bronze	EnergyTech™ Clear	4+12+4	51	11	15	41	11	19	1.6	0.54	20	0.94
		5+12+4	45	9	15	35	9	15	1.6	0.47	22.5	0.96
		6+12+6	41	8	15	34	9	12	1.6	0.48	40	0.85
		10+12+6	28	6	14	23	7	6	1.6	0.36	40	0.78
VLam™ Bronze	EnergyTech™ Clear	6.38+12+6	43	9	15	34	9	<1	1.6	0.47	30.4	0.91
EVantage™ Bronze	VFloat™ Clear	6+12+6	32	13	29	24	11	7	1.5	0.35	30	0.91
EVantage™ Bronze	EnergyTech™ Clear	6+12+6	34	13	29	28	11	9	1.7	0.37	30	0.92
ThermoTech™ Translucent												
VLam™ Translucent	EnergyTech™ Clear	6.38+12+6	56	12	15	40	10	<1	1.6	0.54	30.4	1.04
VLam™ Translucent Grey	EnergyTech™ Clear	6.76+12+6	27	6	14	25	7	<1	1.6	0.44	30.8	0.61
ComfortHush™ Translucent	VFloat™ Clear	6.88+12+6	52	13	18	36	10	<1	1.5	0.48	30.9	1.08
		10.88+12+6	51	12	17	33	10	<1	1.5	0.45	40.9	1.13





# Glass Performance: LightBridge™ & LightBridge next™

LightBridge™ & LightBridge next™ Insulating Glass Units

Product Name	Outside Glass	Inside Glass	Nominal Thickness	Visible			Solar		UV Trans	U Value Argon	SHGC	Weight kg/m²	Selectivity
				Trans.	Refl. Out	Refl. In	Trans.	Refl.					
LightBridge™													
Clear	VFloat™ Clear	LightBridge™	4+12+4	80	14	13	52	32	37	1.4	0.59	20	1.36
	VFloat™ Clear	LightBridge™	5+12+5	78	12	12	48	26	33	1.4	0.56	25	1.39
	VFloat™ Clear	LightBridge™	6+12+6	78	12	12	47	25	31	1.4	0.55	30	1.42
	VFloat™ Clear	LightBridge™	8+12+8	76	12	12	43	21	29	1.4	0.52	35	1.46
Light Grey	VFloat™ Light Grey	LightBridge™	5+12+5	60	9	11	37	17	21	1.4	0.44	25	1.36
	VFloat™ Light Grey	LightBridge™	6+12+6	56	8	11	34	15	19	1.4	0.42	30	1.33
Grey	VFloat™ Grey	LightBridge™	4+12+4	49	7	10	33	16	17	1.4	0.40	20	1.23
	VFloat™ Grey	LightBridge™	5+12+5	42	7	10	28	13	13	1.4	0.36	25	1.17
	VFloat™ Grey	LightBridge™	6+12+6	37	6	10	24	11	11	1.4	0.32	30	1.16
DécorSatin™	DécorSatin™	LightBridge™	4+12+4	80	13	13	52	32	37	1.4	0.59	20	1.36
	DécorSatin™	LightBridge™	6+12+6	78	12	12	47	25	31	1.4	0.55	30	1.42
	DécorSatin™	LightBridge™	8+12+8	77	12	12	46	20	23	1.4	0.53	35	1.45
DécorSatin™ Grey	DécorSatin™ Grey	LightBridge™	4+12+4	50	7	11	35	15	15	1.4	0.41	20	1.22
	DécorSatin™ Grey	LightBridge™	6+12+6	37	6	10	27	11	15	1.4	0.33	30	1.12
LightBridge next™													
Clear	VLam™ Hush Clear	LightBridge™	6.5+12+4	79	12	12	49	20	< 1	1.4	0.54	25.4	1.46
	VLam™ Hush Clear	LightBridge™	6.5+12+5	79	12	12	48	20	< 1	1.4	0.54	28.4	1.46
	VLam™ Hush Clear	LightBridge™	6.5+12+6	78	12	13	48	20	< 1	1.4	0.54	30.4	1.44
	VLam™ Hush Clear	LightBridge™	8.5+12+8	78	12	12	46	19	< 1	1.4	0.54	40.4	1.44
Light Grey	VLam™ Hush Light Grey	LightBridge™	6.88+12+4	53	8	11	35	15	< 1	1.4	0.41	25.5	1.29
	VLam™ Hush Light Grey	LightBridge™	6.88+12+5	53	8	11	35	15	< 1	1.4	0.41	28.5	1.29
	VLam™ Hush Light Grey	LightBridge™	6.88+12+6	52	8	11	34	14	< 1	1.4	0.41	30.5	1.27
	VLam™ Hush Light Grey	LightBridge™	8.88+12+8	52	8	11	33	19	< 1	1.4	0.41	40.5	1.27
Grey	VLam Hush™ Grey	LightBridge™	6.88+12+4	38	6	10	28	13	< 1	1.4	0.35	25.5	1.09
	VLam Hush™ Grey	LightBridge™	6.88+12+5	38	6	10	28	13	< 1	1.4	0.35	28.5	1.09
	VLam Hush™ Grey	LightBridge™	6.88+12+6	38	6	10	28	13	< 1	1.4	0.35	30.5	1.09
	VLam Hush™ Grey	LightBridge™	8.88+12+8	37	6	10	27	13	< 1	1.4	0.35	40.5	1.03

# Glass Performance: Viridian ClimaTech™

Viridian ClimaTech™ Insulating Glass Units

Product Name	Outside Glass	Inside Glass	Nominal Thickness	Visible			Solar		UV Trans	U Value	SHGC	Weight kg/m²	Selectivity
				Trans.	Refl. Out	Refl. In	Trans.	Refl.		Argon			
Viridian ClimaTech™													
Clear	VFloat™ Clear	Viridian ClimaTech™	4+12+4	77	13	13	51	25	50	1.5	0.64	20	1.20
	VFloat™ Clear	Viridian ClimaTech™	5+12+5	75	12	12	47	21	44	1.5	0.61	25	1.23
	VFloat™ Clear	Viridian ClimaTech™	6+12+6	74	12	12	46	20	41	1.5	0.60	30	1.23
	Viridian ClimaTech™ Clear	VFloat™ Clear	6+12+6	74	12	12	46	20	41	1.5	0.54	30	1.37
Light Grey	VFloat™ Light Grey	Viridian ClimaTech™	6+12+5	53	8	10	33	13	24	1.5	0.45	28	1.18
	VFloat™ Light Grey	Viridian ClimaTech™	6+12+6	53	8	10	33	13	24	1.5	0.45	30	1.18
Grey	VFloat™ Grey	Viridian ClimaTech™	6+12+5	35	6	10	24	10	14	1.5	0.35	28	1.00
	VFloat™ Grey	Viridian ClimaTech™	6+12+6	35	6	9	24	10	14	1.5	0.35	30	1.00
Bronze	VFloat™ Bronze	Viridian ClimaTech™	6+12+6	43	7	10	29	13	14	1.5	0.42	30	1.02
Green	VFloat™ Green	Viridian ClimaTech™	6+12+6	63	10	11	29	9	19	1.5	0.40	30	1.58
Super-Green™	VFloat™ SuperGreen™	Viridian ClimaTech™	6+12+6	56	9	10	24	7	10	1.5	0.33	30	1.70
SuperBlue™	VFloat™ SuperBlue™	Viridian ClimaTech™	6+12+6	44	7	10	22	7	15	1.5	0.32	30	1.38





# Glass Performance: PermaTech™

## PermaTech™ Insulating Glass Units

Outside Glass	Inside Glass	Nominal Thickness	Visible			Solar		UV Trans	U Value	SHGC	Weight kg/m²	Selectivity
			Trans.	Refl. Out	Refl. In	Trans.	Refl.		Argon			
PermaTech™												
PermaTech™ PH08	VFloat™ Clear	6+12+6	68	13	15	29	38	22	1.3	0.33	30	2.01
PermaTech™ PH20	VFloat™ Clear	6+12+6	46	16	18	16	38	7	1.3	0.19	30	2.42
PermaTech™ PH25	VFloat™ Clear	6+12+6	59	15	17	22	48	10	1.3	0.25	30	2.36
PermaTech™ PH30	VFloat™ Clear	6+12+6	68	11	13	26	41	17	1.3	0.29	30	2.34
VFloat™ Light Grey	PermaTech™ PH30	6+12+6	47	9	10	18	20	10	1.3	0.29	30	1.62
VFloat™ Grey	PermaTech™ PH30	6+12+6	32	6	9	12	15	6	1.3	0.23	30	1.39
VFloat™ Green	PermaTech™ PH30	6+12+6	58	10	10	20	11	8	1.3	0.31	30	1.87
VFloat™ Bronze	PermaTech™ PH30	6+12+6	39	7	9	15	22	6	1.3	0.26	30	1.50

# Glass Performance: VistaTech™

## VistaTech™ Insulating Glass Units

Outside Glass	Centre Glass	Inside Glass	Nominal Thickness	Visible			Solar		UV Trans	U Value Argon	SHGC	Weight kg/m²	Selec- tivity
				Trans.	Refl. Out	Refl. In	Trans.	Refl.					
VistaTech™ Ultimate Performance													
VistaTech™ Clear													
VFloat™ Clear	LightBridge™	VFloat™ Clear	4+12+4+12+4	73	19	20	46	34	38	1.1	0.53	30	1.38
VistaTech™ Green													
VFloat™ Green	LightBridge™	VFloat™ Clear	5+12+4+12+4	64	15	19	31	13	19	1.1	0.37	33	1.68
VistaTech™ Grey													
VFloat™ Grey	LightBridge™	VFloat™ Clear	5+12+4+12+4	38	8	18	25	14	14	1.1	0.32	33	1.17
VistaTech™ Light Grey													
VFloat™ Light Grey	LightBridge™	VFloat™ Clear	5+12+4+12+4	55	12	19	33	18	22	1.1	0.40	33	1.34
VistaTech™ PH08													
PermaTech™ PH08	VFloat™ Clear	VFloat™ Clear	6+12+4+12+4	64	18	22	28	40	21	1.0	0.30	35	2.10
VistaTech™ PH30													
PermaTech™ PH30	VFloat™ Clear	VFloat™ Clear	6+12+4+12+4	64	16	20	25	43	17	1.0	0.27	35	2.36
VistaTech XP™ Xtreme Performance													
VistaTech™ Clear													
VFloat™ Clear	LightBridge™	LightBridge™	4+12+4+12+4	72	17	17	40	36	31	0.7	0.50	30	1.42
VistaTech™ Green													
VFloat™ Green	LightBridge™	LightBridge™	5+12+4+12+4	63	13	16	28	13	16	0.7	0.35	33	1.76
VistaTech™ Grey													
VFloat™ Grey	LightBridge™	LightBridge™	5+12+4+12+4	38	8	15	22	14	12	0.7	0.28	33	1.28
VistaTech™ Light Grey													
VFloat™ Light Grey	LightBridge™	LightBridge™	5+12+4+12+4	54	11	16	29	19	18	0.7	0.36	33	1.43
VistaTech™ PH08													
PermaTech™ PH08	LightBridge™	VFloat™ Clear	6+12+4+12+4	62	16	19	26	40	17	0.7	0.29	35	2.12
VistaTech™ PH30													
PermaTech™ PH30	LightBridge™	VFloat™ Clear	6+12+4+12+4	62	14	17	23	43	14	0.7	0.26	35	2.38





# Noise reduction solutions using glazing

The following tables take the specified “Design Sound Level Range” for rooms from AS/NZS 2107: 2016, for various occupancies and activities, and lists the glass to be used to achieve the upper and lower sound level at the room side of the glass.

The standard provides a range for the “Design Sound Level” for a variety of occupancies and activities. The lower level of the range is the most desirable while the upper level should be seen as the least desirable.

The glass solution to achieve the lower level of the “Design Sound Level” range is found in the “Glass required to limit transmission to recommended design noise level” column of the table. This is the most desirable solution.

The glass solution to achieve the upper level of the “Design Sound Level” range is found in the “Glass required to limit transmission to maximum design noise level” column of the table. This is the least desirable solution.

The tables provide the solution for both traffic and aircraft noise for some of the building use designations shown in AS/NZS 2107: 2016. The attenuation of traffic noise in this table is represented by  $R_w+C_{tr}$  and aircraft noise is represented by  $R_w+C$ . These tables relate to the noise level at the room side of the glass not necessarily the noise level in the room because the level in the room is also influenced by other factors such as the roof, walls and floor, not just the glass in the windows.

It should be remembered the “Design Sound Levels” suggested in AS2107 may not necessarily be appropriate in all circumstances. There are various methods for analysing and finding a solution to a noise problem. An acoustic consultant is an authoritative source of information and advice for analysing and developing solutions to noise problems. Consideration should be given to employing their expertise.

Type of Occupancy	External Noise Level dB	Traffic Noise				Aircraft Noise			
		Internal noise level (room side of glass)				Internal noise level (room side of glass)			
		Glass required to limit transmission to recommended design noise level	dB	Glass required to limit transmission to maximum design noise level	dB	Glass required to limit transmission to recommended design noise level	dB	Glass required to limit transmission to maximum design noise level	dB
<b>Board Room</b> Design Sound Level Range 30dB to 40dB  (Recommended noise level in room = 30dB) (Maximum suggested noise level permitted in room = 40dB)	65	10.5mm VLam™ Hush	30	4mm Float™	37	6.5mm VLam™ Hush	30	4mm VFloat™	36
	70	8.5mm VLam™ Hush + 16mm Gap + 12.5mm VLam™ Hush	30	6.38mm VLam™	40	8mm VFloat™ + 16mm Gap + 10.5 VLam™ Hush	29	6.38mm VLam™	38
	75	10mm VFloat™ + 200mm Gap + 6mm VFloat™	30	10.5mm VLam™ Hush	40	8.5mm VLam™ Hush + 16mm Gap + 12.5mm VLam™ Hush	30	6.5mm VLam™ Hush	40
	80	No standard solution	-	8.5mm VLam™ Hush + 16mm Gap + 12.5mm VLam™ Hush	40	No standard solution	-	8mm VFloat™ + 16mm Gap + 10.5 VLam™ Hush	39
<b>Cafeteria</b> Design Sound Level Range 45dB to 50dB  (Recommended noise level in room = 45dB) (Maximum suggested noise level in room = 50dB)	65	4mm VFloat™	37	4mm VFloat™	37	4mm VFloat™	36	4mm VFloat™	36
	70	4mm VFloat™	42	4mm VFloat™	42	4mm VFloat™	41	4mm VFloat™	41
	75	6.38mm VLam™	45	4mm VFloat™	47	5mm VFloat™	45	4mm VFloat™	46
	80	10.5mm VLam™ Hush	45	6.38mm VLam™	50	6.5mm VLam™ Hush	45	6.38mm VLam™	48
<b>Call Centre</b> Design Sound Level Range 40dB to 45dB  (Recommended noise level in room = 40dB) (Maximum suggested noise level in room = 45dB)	65	4mm VFloat™	37	4mm VFloat™	37	4mm VFloat™	36	4mm VFloat™	36
	70	6.38mm VLam™	40	4mm VFloat™	42	6.38mm VLam™	38	4mm VFloat™	41
	75	10.5mm VLam™ Hush	40	6.38mm VLam™	45	6.5mm VLam™ Hush	40	5mm VFloat™	45
	80	8.5mm VLam™ Hush + 16mm Gap + 12.5mm VLam™ Hush	40	10.5mm VLam™ Hush	45	8mm VFloat™ + 16mm Gap + 10.5mm VLam™ Hush	39	6.5mm VLam™ Hush	45
<b>Computer Room</b> Design Sound Level Range 45dB to 50dB  (Recommended noise level in room = 45dB) (Maximum suggested noise level in room = 50dB)	65	4mm VFloat™	37	4mm VFloat™	37	4mm VFloat™	36	4mm VFloat™	36
	70	4mm VFloat™	42	4mm VFloat™	42	4mm VFloat™	41	4mm VFloat™	41
	75	6.38mm VLam™	45	4mm VFloat™	47	5mm VFloat™	45	4mm VFloat™	46
	80	10.5mm VLam™ Hush	45	6.38mm VLam™	50	6.5mm VLam™ Hush	45	6.38mm VLam™	48
<b>Consulting Rooms</b> Design Sound Level Range 40dB to 45dB  (Recommended noise level in room = 40dB) (Maximum suggested noise level in room = 45dB)	65	4mm VFloat™	37	4mm VFloat™	37	4mm VFloat™	36	4mm VFloat™	36
	70	6.38mm VLam™	40	4mm VFloat™	42	6.38mm VLam™	38	4mm VFloat™	41
	75	10.5mm VLam™ Hush	40	6.38mm VLam™	45	6.5mm VLam™ Hush	40	5mm VFloat™	45
	80	8.5mm VLam™ Hush + 16mm Gap + 12.5mm VLam™ Hush	40	10.5mm VLam™ Hush	45	8mm VFloat™ + 16mm Gap + 10.5mm VLam™ Hush	39	6.5mm VLam™ Hush	45



Type of Occupancy	External Noise Level dB	Traffic Noise				Aircraft Noise			
		Internal noise level (room side of glass)		Internal noise level (room side of glass)		Internal noise level (room side of glass)		Internal noise level (room side of glass)	
		Glass required to limit transmission to recommended design noise level	dB	Glass required to limit transmission to maximum design noise level	dB	Glass required to limit transmission to recommended design noise level	dB	Glass required to limit transmission to maximum design noise level	dB
<b>General Office Areas</b>  Design Sound Level Range 40dB to 45dB  (Recommended noise level in room = 40dB)  (Maximum suggested noise level in room = 45dB)	65	4mm VFloat™	37	4mm VFloat™	37	4mm VFloat™	36	4mm VFloat™	36
	70	6.38mm VLam™	40	4mm VFloat™	42	6.38mm VLam™	38	4mm VFloat™	41
	75	10.5mm VLam™ Hush	40	6.38mm VLam™	45	6.5mm VLam™ Hush	40	5mm VFloat™	45
	80	8.5mm VLam™ Hush + 16mm Gap + 12.5mm VLam™ Hush	40	10.5mm VLam™ Hush	45	8mm VFloat™ + 16mm Gap + 10.5 VLam™ Hush	39	6.5mm VLam™ Hush	45
<b>Executive Offices</b>  Design Sound Level Range 35dB to 40dB  Recommended noise level in room = 35dB)  (Maximum suggested noise level in room = 40dB)	65	6.38mm VLam™	35	4mm VFloat™	37	5mm VFloat™	35	4mm VFloat™	36
	70	10.5mm VLam™ Hush	35	6.38mm VLam™	40	6.5mm VLam™ Hush	35	6.38mm VLam™	38
	75	8.5mm VLam™ Hush + 16mm Gap + 12.5mm VLam™ Hush	35	10.5mm VLam™ Hush	40	8mm VFloat™ + 16mm Gap + 10.5 VLam™ Hush	34	6.5mm VLam™ Hush	40
	80	10mm VFloat™ + 200mm Gap + 6mm VFloat™	35	8.5mm VLam™ Hush + 16mm Gap + 12.5mm VLam™ Hush	40	8.5mm VLam™ Hush + 16mm Gap + 12.5mm VLam™ Hush	35	8mm VFloat™ + 16mm Gap + 10.5 VLam™ Hush	39
<b>Reception Area</b>  Design Sound Level Range 40dB to 45dB  (Recommended noise level in room = 40dB)  (Maximum suggested noise level in room = 45dB)	65	4mm VFloat™	37	4mm VFloat™	37	4mm VFloat™	36	4mm VFloat™	36
	70	6.38mm VLam™	40	4mm VFloat™	42	6.38mm VLam™	38	4mm VFloat™	41
	75	10.5mm VLam™ Hush	40	6.38mm VLam™	45	6.5mm VLam™ Hush	40	5mm VFloat™	45
	80	8.5mm VLam™ Hush + 16mm Gap + 12.5mm VLam™ Hush	40	10.5mm VLam™ Hush	45	8mm VFloat™ + 16mm Gap + 10.5mm VLam™ Hush	39	6.5mm VLam™ Hush	45
<b>Lobby</b>  Design Sound Level Range 45dB to 50dB  (Recommended noise level in room = 45dB)  (Maximum suggested noise level in room = 50dB)	65	4mm VFloat™	37	4mm VFloat™	37	4mm VFloat™	36	4mm VFloat™	36
	70	4mm VFloat™	42	4mm VFloat™	42	4mm VFloat™	41	4mm VFloat™	41
	75	6.38mm VLam™	45	4mm VFloat™	47	5mm VFloat™	45	4mm VFloat™	46
	80	10.5mm VLam™ Hush	45	6.38mm VLam™	50	6.5mm VLam™ Hush	45	6.38mm VLam™	48
<b>General Offices</b>  Design Sound Level Range 40dB to 45dB  (Recommended noise level in room = 40dB)  (Maximum suggested noise level in room = 45dB)	65	4mm VFloat™	37	4mm VFloat™	37	4mm VFloat™	36	4mm VFloat™	36
	70	6.38mm VLam™	40	4mm VFloat™	42	6.38mm VLam™	38	4mm VFloat™	41
	75	10.5mm VLam™ Hush	40	6.38mm VLam™	45	6.5mm VLam™ Hush	40	5mm VFloat™	45
	80	8.5mm VLam™ Hush + 16mm Gap + 12.5mm VLam™ Hush	40	10.5mm VLam™ Hush	45	8mm VFloat™ + 16mm Gap + 10.5mm VLam™ Hush	39	6.5mm VLam™ Hush	45

Type of Occupancy	External Noise Level dB	Traffic Noise				Aircraft Noise			
		Internal noise level (room side of glass)		Internal noise level (room side of glass)		Internal noise level (room side of glass)		Internal noise level (room side of glass)	
		Glass required to limit transmission to recommended design noise level	dB	Glass required to limit transmission to maximum design noise level	dB	Glass required to limit transmission to recommended design noise level	dB	Glass required to limit transmission to maximum design noise level	dB
<b>Airport Departure Lounge</b>  Design Sound Level Range 45dB to 50dB  (Recommended noise level in room = 45dB)  (Maximum suggested noise level in room = 50dB)	65	4mm VFloat™	37	4mm VFloat™	37	4mm VFloat™	36	4mm VFloat™	36
	70	4mm VFloat™	42	4mm VFloat™	42	4mm VFloat™	41	4mm VFloat™	41
	75	6.38mm VLam™	45	4mm VFloat™	47	5mm VFloat™	45	4mm VFloat™	46
	80	10.5mm VLam™ Hush	45	6.38mm VLam™	50	6.5mm VLam™ Hush	45	6.38mm VLam™	48
<b>Airport Passenger Check-in Area</b>  Design Sound Level Range 45dB to 50dB  (Recommended noise level in room = 45dB)  (Maximum suggested noise level in room = 50dB)	65	4mm VFloat™	37	4mm VFloat™	37	4mm VFloat™	36	4mm VFloat™	36
	70	4mm VFloat™	42	4mm VFloat™	42	4mm VFloat™	41	4mm VFloat™	41
	75	6.38mm VLam™	45	4mm VFloat™	47	5mm VFloat™	45	4mm VFloat™	46
	80	10.5mm VLam™ Hush	45	6.38mm VLam™	50	6.5mm VLam™ Hush	45	6.38mm VLam™	48
<b>Art Gallery</b>  Design Sound Level Range 40dB to 45dB  (Recommended noise level in room = 40dB)  (Maximum suggested noise level in room = 45dB)	65	4mm VFloat™	37	4mm VFloat™	37	4mm VFloat™	36	4mm VFloat™	36
	70	6.38mm VLam™	40	4mm VFloat™	42	6.38mm VLam™	38	4mm VFloat™	41
	75	10.5mm VLam™ Hush	40	6.38mm VLam™	45	6.5mm VLam™ Hush	40	5mm VFloat™	45
	80	8.5mm VLam™ Hush + 16mm Gap + 12.5mm VLam™ Hush	40	10.5mm VLam™ Hush	45	8mm VFloat™ + 16mm Gap + 10.5mm VLam™ Hush	39	6.5mm VLam™ Hush	45
<b>Exhibition Areas</b>  Design Sound Level Range 40dB to 50dB  (Recommended noise level in room = 40dB)  (Maximum suggested noise level in room = 50dB)	65	4mm VFloat™	37	4mm VFloat™	37	4mm VFloat™	36	4mm VFloat™	36
	70	6.38mm VLam™	40	4mm VFloat™	42	5mm VFloat™	40	4mm VFloat™	41
	75	10.5mm VLam™ Hush	40	6.38mm VLam™	45	6.5mm VLam™ Hush	40	4mm VFloat™	46
	80	8.5mm VLam™ Hush + 16mm Gap + 12.5mm VLam™ Hush	40	10.5mm VLam™ Hush	45	8mm VFloat™ + 16mm Gap + 10.5mm VLam™ Hush	39	6.38mm VLam™	48
<b>Place of Worship</b>  Design Sound Level Range 30dB to 40dB  (Recommended noise level in room = 30dB)  (Maximum suggested noise level in room = 40dB)	65	10.5mm VLam™ Hush	30	4mm VFloat™	40	6.5mm VLam™ Hush	30	4mm VFloat™	36
	70	8.5mm VLam™ Hush + 16mm Gap + 12.5mm VLam™ Hush	30	6.38mm VLam™	40	8mm VFloat™ + 16mm Gap + 10.5mm VLam™ Hush	29	5mm VFloat™	40
	75	10mm VFloat™ + 200mm Gap + 6mm VFloat™	30	10.5mm VLam™ Hush	40	8.5mm VLam™ Hush + 16mm Gap + 12.5mm VLam™ Hush	30	6.5mm VLam™ Hush	40
	80	No standard solution	-	8.5mm VLam™ Hush + 16mm Gap + 12.5mm VLam™ Hush	40	No standard solution	-	8mm VFloat™ + 16mm Gap + 10.5mm VLam™ Hush	39



Type of Occupancy	External Noise Level dB	Traffic Noise				Aircraft Noise			
		Internal noise level (room side of glass)				Internal noise level (room side of glass)			
		Glass required to limit transmission to recommended design noise level	dB	Glass required to limit transmission to maximum design noise level	dB	Glass required to limit transmission to recommended design noise level	dB	Glass required to limit transmission to maximum design noise level	dB
<b>Court Room Design</b> Sound Level Range 30dB to 35dB  (Recommended noise level in room = 30dB) (Maximum suggested noise level in room = 35dB)	65	10.5mm VLam™ Hush	30	6.38 VLam™	35	6.5mm VLam™ Hush	30	5mm Float™	35
	70	8.5mm VLam™ Hush + 16mm Gap + 12.5mm VLam™ Hush	30	10.5mm VLam™ Hush	35	8mm VFloat™ + 16mm Gap + 10.5mm VLam™ Hush	29	6.5mm VLam™ Hush	35
	75	10mm VFloat™ + 200mm Gap + 6mm VFloat™	30	8.5mm VLam™ Hush + 16mm Gap + 12.5mm VLam™ Hush	35	8.5mm VLam Hush + 16mm Gap + 12.5mm VLam Hush	30	8mm VFloat™ + 16mm Gap + 10.5mm VLam™ Hush	34
	80	No standard solution	-	10mm VFloat™ + 200mm Gap + 6mm VFloat™	35	No standard solution	-	8.5mm VLam™ Hush + 16mm Gap + 12.5mm VLam™ Hush	35
<b>Library Reading Area Design</b> Sound Level Range 40dB to 45dB  (Recommended noise level in room = 40dB) (Maximum suggested noise level in room = 45dB)	65	4mm VFloat™	37	4mm VFloat™	37	4mm VFloat™	36	4mm VFloat™	36
	70	6.38mm VLam™	40	4mm VFloat™	42	5mm VFloat™	40	4mm VFloat™	41
	75	10.5mm VLam™ Hush	40	6.38mm VLam™	45	6.5mm VLam™ Hush	40	5mm VFloat™	45
	80	8.5mm VLam™ Hush + 16mm Gap + 12.5mm VLam™ Hush	40	10.5mm VLam™ Hush	45	8mm VFloat™ + 16mm Gap + 10.5mm VLam™ Hush	39	6.5mm VLam™ Hush	45
<b>Museum Exhibition Area Design</b> Sound Level Range 40dB to 45dB  (Recommended noise level in room = 40dB) (Maximum suggested noise level in room = 45dB)	65	4mm VFloat™	37	4mm VFloat™	37	4mm VFloat™	36	4mm VFloat™	36
	70	6.38mm VLam™	40	4mm VFloat™	42	5mm VFloat™	38	4mm VFloat™	41
	75	10.5mm VLam™ Hush	40	6.38mm VLam™	45	6.5mm VLam™ Hush	40	5mm VFloat™	45
	80	8.5mm VLam™ Hush + 16mm Gap + 12.5mm VLam™ Hush	40	10.5mm VLam™ Hush	45	8mm VFloat™ + 16mm Gap + 10.5mm VLam™ Hush	39	6.5mm VLam™ Hush	45
<b>Post Offices and General Banking Areas Design</b> Sound Level Range 45dB to 50dB  (Recommended noise level in room = 45dB) (Maximum suggested noise level in room = 50dB)	65	4mm VFloat™	37	4mm VFloat™	37	4mm VFloat™	36	4mm VFloat™	36
	70	4mm VFloat™	42	4mm VFloat™	42	4mm VFloat™	41	4mm VFloat™	41
	75	6.38mm VLam™	45	4mm VFloat™	47	6.38mm VLam™	43	4mm VFloat™	46
	80	10.5mm VLam™ Hush	45	6.38mm VLam™	50	6.5mm VLam™ Hush	45	6.38mm VLam™	48
<b>Railway and Bus Terminal Ticket Areas Design</b> Sound Level Range 45dB to 50dB  (Recommended noise level in room = 45dB) (Maximum suggested noise level in room = 50dB)	65	4mm VFloat™	37	4mm VFloat™	37	4mm VFloat™	36	4mm VFloat™	36
	70	4mm VFloat™	42	4mm VFloat™	42	4mm VFloat™	41	4mm VFloat™	41
	75	6.38mm VLam™	45	6.38mm VLam™	45	6.38mm VLam™	43	4mm VFloat™	46
	80	10.5mm VLam™ Hush	45	6.38mm VLam™	50	6.5mm VLam™ Hush	45	6.38mm VLam™	48

Type of Occupancy	External Noise Level dB	Traffic Noise				Aircraft Noise			
		Internal noise level (room side of glass)				Internal noise level (room side of glass)			
		Glass required to limit transmission to recommended design noise level	dB	Glass required to limit transmission to maximum design noise level	dB	Glass required to limit transmission to recommended design noise level	dB	Glass required to limit transmission to maximum design noise level	dB
<b>Restaurants, and Coffee shops Design</b> Sound Level Range 40dB to 50dB  (Recommended noise level in room = 40dB) (Maximum suggested noise level in room = 50dB)	65	4mm VFloat™	37	4mm VFloat™	37	4mm VFloat™	36	4mm VFloat™	36
	70	6.38mm VLam™	40	4mm VFloat™	42	5mm VFloat™	38	4mm VFloat™	41
	75	10.5mm VLam™ Hush	40	6.38mm VLam™	45	6.5mm VLam™ Hush	40	4mm VFloat™	46
	80	8.5mm VLam™ Hush + 16mm Gap + 12.5mm VLam™ Hush	40	6.38mm VLam™	50	8mm VFloat™ + 16mm Gap + 10.5mm VLam™ Hush	39	6.38mm VLam™	48
<b>Coffee Bars Design</b> Sound Level Range 45dB to 50dB  (Recommended noise level in room = 45dB) (Maximum suggested noise level in room = 50dB)	65	4mm VFloat™	37	4mm VFloat™	37	4mm VFloat™	36	4mm VFloat™	36
	70	4mm VFloat™	42	4mm VFloat™	42	4mm VFloat™	41	4mm VFloat™	41
	75	6.38mm VLam™	45	6.38mm VLam™	45	6.38mm VLam™	43	4mm VFloat™	46
	80	10.5mm VLam™ Hush	45	6.38mm VLam™	50	6.5mm VLam™ Hush	45	6.38mm VLam™	48
<b>Houses and Apartments near minor roads Sleeping Areas Design</b> Sound Level Range 30dB to 35dB  (Recommended noise level in room = 30dB) (Maximum suggested noise level in room = 35dB)	65	10.5mm VLam™ Hush	30	6.38 VLam™	35	6.5mm VLam™ Hush	30	5mm VFloat™	35
	70	8.5mm VLam™ Hush + 16mm Gap + 12.5mm VLam™ Hush	30	10.5mm VLam™ Hush	35	8mm VFloat™ + 16mm Gap + 10.5mm VLam™ Hush	29	6.5mm VLam™ Hush	35
	75	10mm VFloat™ + 200mm Gap + 6mm VFloat™	30	8.5mm VLam™ Hush + 16mm Gap + 12.5mm VLam™ Hush	35	8.5mm VLam™ Hush + 16mm Gap + 12.5mm VLam™ Hush	30	8mm VFloat™ + 16mm Gap + 10.5mm VLam™ Hush	34
	80	No standard solution	-	10mm VFloat™ + 200mm Gap + 6mm VFloat™	35	No standard solution	-	8.5mm VLam™ Hush + 16mm Gap + 12.5mm VLam™ Hush	35
<b>Houses and Apartments near minor roads Living Areas Design</b> Sound Level Range 30dB to 40dB  (Recommended noise level in room = 30dB) (Maximum suggested noise level in room = 40dB)	65	10.5mm VLam™ Hush	30	4mm VFloat™	37	6.5mm VLam™ Hush	30	4mm VFloat™	36
	70	8.5mm VLam™ Hush + 16mm Gap + 12.5mm VLam™ Hush	30	6.38mm VLam™	40	8mm VFloat™ + 16mm Gap + 10.5mm VLam™ Hush	29	5mm VFloat™	40
	75	10mm VFloat™ + 200mm Gap + 6mm VFloat™	30	10.5mm VLam™ Hush	40	8.5mm VLam™ Hush + 16mm Gap + 12.5mm VLam™ Hush	30	6.5mm VLam™ Hush	40
	80	No standard solution	-	8.5mm VLam™ Hush + 16mm Gap + 12.5mm VLam™ Hush	40	No standard solution	-	8mm VFloat™ + 16mm Gap + 10.5mm VLam™ Hush	39
<b>Houses and Apartments near major roads Sleeping Areas Design</b> Sound Level Range 35dB to 40dB  (Recommended noise level in room = 35dB) (Maximum suggested noise level in room = 40dB)	65	6.38mm VLam	35	4mm Float	37	5mm VFloat	35	4mm VFloat	36
	70	10.5mm VLam Hush	35	6.38mm VLam	40	6.5mm VLam Hush	35	5mm VFloat	38
	75	8.5mm VLam Hush + 16mm Gap + 12.5mm VLam Hush	35	10.5mm VLam Hush	40	8mm VFloat + 16mm Gap + 10.5mm VLam Hush	34	6.5mm VLam Hush	40
	80	10mm VFloat+ 200mm Gap + 6mm VFloat	35	8.5mm VLam Hush + 16mm Gap + 12.5mm VLam Hush	40	8.5mm VLam Hush + 16mm Gap + 12.5mm VLam Hush	35	8mm VFloat + 16mm Gap + 10.5mm VLam Hush	39



Type of Occupancy	External Noise Level dB	Traffic Noise				Aircraft Noise			
		Internal noise level (room side of glass)				Internal noise level (room side of glass)			
		Glass required to limit transmission to recommended design noise level		Glass required to limit transmission to maximum design noise level		Glass required to limit transmission to recommended design noise level		Glass required to limit transmission to maximum design noise level	
			dB		dB		dB		dB
<b>Houses and Apartments near major roads</b> <b>Living Areas</b>  <b>Design Sound Level Range 35dB to 45dB</b>  (Recommended noise level in room = 35dB) (Maximum suggested noise level in room = 45dB)	65	6.38mm VLam™	35	4mm VFloat™	37	5mm VFloat™	35	4mm VFloat™	36
	70	10.5mm VLam™ Hush	35	4mm VFloat™	42	6.5mm VLam™ Hush	35	4mm VFloat™	41
	75	8.5mm VLam™ Hush + 16mm Gap + 12.5mm VLam™ Hush	35	6.38mm VLam™	45	8mm VFloat™ + 16mm Gap + 10.5mm VLam™ Hush	34	6.38mm VLam™	43
	80	10mm VFloat™ + 200mm Gap + 6mm VFloat™	35	10.5mm VLam™ Hush	45	8.5mm VLam™ Hush + 16mm Gap + 12.5mm VLam™ Hush	35	6.5mm VLam™ Hush	45
<b>Hotels and Motels near minor roads</b> <b>Sleeping areas</b>  <b>Design Sound Level Range 30dB to 35dB</b>  (Recommended noise level in room = 30dB) (Maximum suggested noise level in room = 35dB)	65	10.5mm VLam™ Hush	30	6.38mm VLam™	35	6.5mm VLam™ Hush	30	5mm VFloat™	35
	70	8.5mm VLam™ Hush + 16mm Gap + 12.5mm VLam™ Hush	30	10.5mm VLam™ Hush	35	8mm VFloat™ + 16mm Gap + 10.5mm VLam™ Hush	29	6.5mm VLam™ Hush	35
	75	10mm VFloat™ + 200mm Gap + 6mm VFloat™	30	8.5mm VLam™ Hush + 16mm Gap + 12.5mm VLam™ Hush	35	8.5mm VLam™ Hush + 16mm Gap + 12.5mm VLam™ Hush	30	8mm VFloat™ + 16mm Gap + 10.5mm VLam™ Hush	34
	80	No standard solution	-	10mm VFloat™ + 200mm Gap + 6mm VFloat™	35	No standard solution	-	8.5mm VLam™ Hush + 16mm Gap + 12.5mm VLam™ Hush	35
<b>Hotels and Motels near major roads</b> <b>Sleeping Areas</b>  <b>Design Sound Level Range 35dB to 40dB</b>  (Recommended noise level in room = 35dB) (Maximum suggested noise level in room = 40dB)	65	6.38mm VLam™	35	4mm VFloat™	37	5mm VFloat™	35	4mm VFloat™	36
	70	10.5mm VLam™ Hush	35	6.38mm VLam™	40	6.5mm VLam™ Hush	35	5mm VFloat™	40
	75	8.5mm VLam™ Hush + 16mm Gap + 12.5mm VLam™ Hush	35	10.5mm VLam™ Hush	40	8mm VFloat™ + 16mm Gap + 10.5mm VLam™ Hush	34	6.5mm VLam™ Hush	40
	80	10mm VFloat™ + 200mm Gap + 6mm VFloat™	35	8.5mm VLam™ Hush + 16mm Gap + 12.5mm VLam™ Hush	40	8.5mm VLam™ Hush + 16mm Gap + 12.5mm VLam™ Hush	35	8mm VFloat™ + 16mm Gap + 10.5 VLam™ Hush	39



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