

# HIGH PERFORMANCE GLASS SOLUTIONS



**SMARTGLASS™**

*SmartGlass is a brand of Glass SA, a PG Group company*

**GSA**

**PG**  
GROUP

# INTRODUCING SMARTGLASS

SmartGlass offers superior functionality to ordinary glass. With SmartGlass you can let in light and views while improving safety, security, insulation and energy efficiency in buildings. SmartGlass provides a choice of coating, tinting, toughening, laminating and double glazing options that can be combined to meet specific performance requirements. A range of finishes, colours and patterns give you the freedom to incorporate glass into dazzling architectural and interior designs.

## **Toughened SmartGlass**

Toughened glass is five times stronger than ordinary glass, has a high resistance to impact and wind loading, and can withstand temperatures ranging from -200 °C to 300 °C. Toughened SmartGlass is manufactured by heating normal flat glass and then rapidly cooling the surface using air jets. This toughening process sets up high compressive stresses on the surface of the glass, with balancing tensile stresses in the centre. These balanced stresses give toughened glass its strength, thermal stress resistance and safety properties. The SmartGlass range includes several toughened products designed for structural and safety glazing, curtain walls, partitions, and interior and exterior cladding.

## **Laminated SmartGlass**

Laminated SmartGlass is manufactured by permanently bonding one or more polyvinyl butyral (PVB) interlayers between sheets of clear, coated or body-tinted float glass under heat and pressure. SmartGlass laminates can incorporate various combinations of clear and tinted glass, transparent or coloured interlayers, as well as a range of high performance coatings.

## **Coated SmartGlass**

Coated SmartGlass has thin layers of material applied to the surface of the glass to add properties such as reduced light transmission, increased solar energy elimination, colour and aesthetic properties. Examples of coated glass includes mirrors, spectrally selective glass and screened glass.

## **Double Glazed SmartGlass**

SmartGlass InsulVue double glazed units are manufactured from two or more panes of glass held apart by a metal spacer and bonded with a primary and secondary seal. Dehydrated air is trapped between the glass panes. InsulVue is available in glass combinations that offer a wide range of performance characteristics and appearances.

## **Cutting and glazing of sided products**

Some SmartGlass products are "sided", meaning that their appearance may vary when viewed from different sides. SmartGlass laminates and double glazing are labelled by the factory to indicate the coated side or the side that should face to the outside. Care must be exercised when cutting or glazing to achieve the desired performance and appearance. It is important that the coated side be identified before cutting stock sheets, especially with products such as SolarVue and CoolVue.



## QUALITY, ENVIRONMENTAL MANAGEMENT AND SAFETY

### **Standards**

SmartGlass complies fully with the ISO 9001:2000 quality management standard, and manufactures specific products to other relevant international standards, including SABS, BS and ANSI. The SmartGlass manufacturing facility has also attained ISO 14001 certification for environmental management.

### **Building regulations**

Laminated and toughened SmartGlass meet the safety requirements of the National Building Regulations as defined by SABS 1263-1. Laminates can also be manufactured on request to meet the SABS 1263-2 standard governing burglar and vandal resistance.

### **Warranty**

All SmartGlass products sold in South Africa carry a limited 10-year warranty. SmartGlass also underwrites a workmanship guarantee on all residential installations carried out by certified SmartGlass Network Partners using SmartGlass products.

## GSA PROJECT TEAM

The GSA National Project Team works with architects and other specifiers to select the most appropriate SmartGlass products for their projects. Members of the Project Team are also available to assist GSA Network Partners in selecting optimal SmartGlass solutions when they tender on projects. The Project Team can be contacted on: Cape Town: 021 931 8361, Durban: 031 700 1230, Johannesburg: 011 392 4430, Port Elizabeth: 041 582 1222.

**0860 695 695**  
**EVERYONE'S GLASS**  
**CONNECTION**



GSA's SmartGlass Network makes it easy to get product support and expert services through the SmartGlass Resource Centre. Whether you're looking for a certified SmartGlass Network Partner, a GSA project manager, aluminium installers, or SmartGlass product information, simply call the SmartGlass Service Resource on 0860 695 695.

The SmartGlass Service Centre has a state-of-the-art system in place to send your request to exactly the right person — and track it so that you get prompt service. You don't have to worry about admin or running around; the SmartGlass Resource Centre will do it all for you.

For more information, call the SmartGlass Resource Centre on 0860 695 695 or visit [www.smartglass.co.za](http://www.smartglass.co.za).

ClearVue™ float glass is manufactured by PFG Building Glass, the only float glass manufacturer in sub-Saharan Africa.

ClearVue is used in basic glazing applications and in the manufacturing of value-added products such as SmartGlass mirror, laminated glass and toughened glass.

Stock sizes of ClearVue can be delivered within one working day.

**Specifications**

ClearVue is manufactured under ISO 9001:2000 quality management standards and satisfies the requirements of BS/EN 572 Parts 1 and 2, as well as other international standards. ClearVue may only be used in applications where safety glass is not required.

**Recommended glazing thickness**

Like all annealed glass, ClearVue is subject to building regulations that govern the thickness relative to the size of a pane. These regulations are summarized in the table below.

Glazing Area (m²)	Nominal Thickness (mm)	Maximum Sheet Size (mm)	Approx. Mass (kg/m²)
0.00 - 0.75	3	2440 x 1830	7.5
0.75 - 1.50	4	3700 x 2440	10.0
1.50 - 2.10	5	3210 x 2440	12.5
2.10 - 3.20	6	3210 x 2250	15.0



Raw material entering the furnace



Glass ribbon in float bath



Offline cutting machine



P E R F O R M A N C E	
Security Solutions	Yes
Safety Solutions	Yes
Solar Control Solutions	Yes
UV Protection Solutions	Yes
Sound Control Solutions	Yes
Decorative Solutions	Yes
Building Aesthetics Solutions	Yes
Energy Efficiency Solutions	Yes

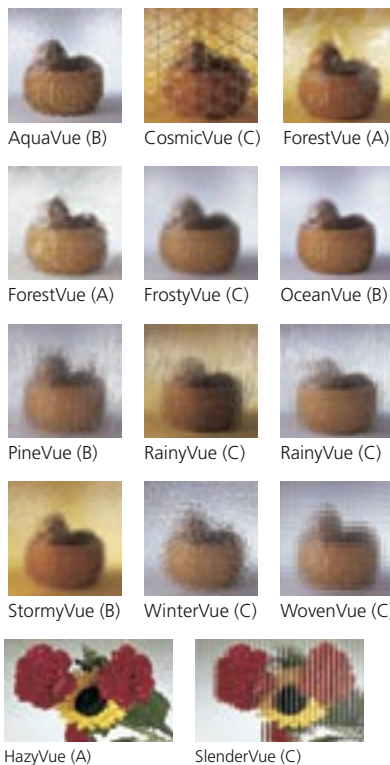
DecorVue™ patterned glass obscures a view without noticeable loss of natural or artificial light. DecorVue is available in a range of textures, making it possible to achieve the desired functionality with a decorative effect that complements the aesthetic environment.

**Specifications**

DecorVue is manufactured under ISO 9001:2000 quality management standards and satisfies the requirements of BS/EN 572 Parts 1 and 5.

**Obscurity**

	Obscurity	Clear				Amber 4 mm	Armourplate
		4 mm	5 mm	6 mm	10 mm		
AquaVue	B	Y	Y		Y		Y
CosmicVue	C					Y	N
FrostyVue	C	Y	Y	Y	Y		Y
ForestVue	A	Y		Y	Y	Y	Y
HazyVue	A	Y			Y		Y
ImbubeVue		Y	Y	Y			Y
OceanVue	B	Y					Y
PineVue	B	Y			Y		Y
RainyVue	C	Y		Y	Y		Y
SlenderVue	C	Y	Y	Y	Y		10 mm only
StormyVue	B					Y	Y
WinterVue	C	Y			Y		Y
WovenVue	C						



There are variations in obscurity between different patterns of DecorVue. Obscurity levels of clear and tinted patterns are classified as follows:

- A = low obscurity
- B = medium obscurity
- C = high obscurity

P E R F O R M A N C E	
Security Solutions	Yes
Safety Solutions	Yes
Solar Control Solutions	Yes
UV Protection Solutions	Yes
Sound Control Solutions	Yes
Decorative Solutions	Yes
Building Aesthetics Solutions	Yes
Energy Efficiency Solutions	Yes



AquaVue (obscurity level B)



OceanVue (obscurity level B)



HazyVue (obscurity level A)

The DecorLam™ range combines the obscuration and decorative properties of DecorVue patterned glass with the safety, security, UV control and sound dampening features of laminated SmartGlass.

DecorLam is manufactured by bonding a polyvinyl butyral (PVB) interlayer between a pane of DecorVue patterned glass and another pane of glass under heat and pressure. DecorLam can be custom-made to offer the same properties as products in the ColourVue, SolarVue, Solarshield and CoolVue ranges.

Due to manufacturing constraints DecorLam is available in three patterns only: OceanVue, HazyVue and AquaVue.

**Strength rating**

DecorLam is available only in one strength: High Impact (HI) with a 1.52 mm PVB interlayer, suitable for security in high-risk applications.

**Safety rating**

DecorLam is marked to SABS 1263-1, making it ideal for doors and other applications that require safety glass.

**Transmission and shading**

There are variations in obscuration between different patterns of DecorLam.

A = low obscuration

B = medium obscuration

C = high obscuration



PERFORMANCE	
Security Solutions	
Safety Solutions	+++
Solar Control Solutions	
UV Protection Solutions	
Sound Control Solutions	
Decorative Solutions	☀️☀️☀️
Building Aesthetics Solutions	🏠🏠🏠
Energy Efficiency Solutions	⚡



ARMOURPLATE®

toughened safety glass



Michelangelo Towers, Sandton  
Architect: Bentel Associates International  
Product: 10 mm clear Armourplate



PERFORMANCE	
Security Solutions	
Safety Solutions	+++
Solar Control Solutions	☀️
UV Protection Solutions	
Sound Control Solutions	
Decorative Solutions	☀️☀️☀️
Building Aesthetics Solutions	🏠🏠🏠
Energy Efficiency Solutions	⚡

Armourplate® toughened safety glass is ideal for bolted structural glazing and frameless applications. Superb resistance to thermal stress also allows Armourplate to be used in applications such as refrigerator and oven doors, where ordinary annealed glass would be likely to fracture. Armourplate is available in a range of thicknesses and various colours. Armourplate meets the safety glass requirements of the South African National Building Regulations.

**Colours**

Clear, Antisun Grey, Antisun Bronze, Serene Green. Other colours available on request.

**Coatings**

Armourplate can be readily produced with any coating from the SmartGlass E Range. Other coatings are available on request.

**Patterned obscure glass**

Armourplate is available in selected DecorVue patterns.

**Sizes**

Armourplate is available in thicknesses ranging from 4 mm to 19 mm. The maximum size that can be processed is 4000 mm x 2000 mm, subject to a maximum weight of 240 kg. Different maximum sizes apply to various colours, thicknesses and patterns. Recommended maximum size will depend on application and design load.

**Transparent float glass – clear**

Nominal thickness (mm)	Normal size limits (mm)	Approximate Mass (kg/m²)
4	3700 x 2000	10
5	3210 x 2000	12.5
6	3210 x 2000	15
8	3210 x 2000	20
10	3210 x 2000	25
12	3210 x 2000	30
15	3210 x 2000	37.5 (240 kg max)
19	3210 x 2000	47.5 (240 kg max)

**Transparent float glass – tinted**

Nominal thickness (mm)	Normal size limits (mm)	Approximate Mass (kg/m²)
4	3210 x 2000	10
6	3210 x 2000	15
10	3210 x 2000	25
12	3210 x 2000	30

**Patterned obscure glass – clear & amber**

Max. sheet size Clear (mm)	Max. sheet size Amber (mm)	Max. sheet size RainyVue / Amber (mm)	Approx. Mass (kg/m²)
<b>Nominal thickness 4 mm</b>			
2140 x 1325	2150 x 1400	2150 x 1250	10
<b>Nominal thickness 6 mm</b>			
2140 x 1325	2150 x 1400	2150 x 1250	15
<b>Nominal thickness 8 mm</b>			
2140 x 1325	2150 x 1400	2150 x 1250	20
<b>Nominal thickness 10 mm</b>			
2140 x 1325	2150 x 1400	2150 x 1250	25

Armourclad® is a coloured enamelled, toughened glass suitable for structural and safety glazing. It can be used in conventional four-sided frames or flush glazed assemblies, and is ideal for frameless bolted and silicone-bonded structures.

Roller coating with a solid colour renders Armourclad opaque, making it an attractive alternative to conventional materials for interior and exterior cladding of buildings. It is easy to clean, repels dirt and has a smooth, silky surface.

The enamel coating is fired into the glass surface and is UV-stabilised to ensure resistance against the effects of sunlight. Colour-fastness is guaranteed for ten years.

**Colours**

Solar Bronze, Ford Blue, Solex, Solar Gray, Lava Bronze, Gunmetal, Black, White. Custom colours can be produced on request, depending on quantity.

Final colour selection must be based on an actual sample of Armourclad. A virtually unlimited colour spectrum is available on minimum order quantities of 400 m² or more. If you do not find the colour you want within the standard range, please send us a sample of the required colour. We will match it and submit a return sample indicating the colour that can be achieved in Armourclad.

Six to eight weeks must be allowed for colour matching and sample approval. It is important to note that, while colour variation will be minimised as far as possible, colours can vary marginally within and between production batches.

**Patterned glass**

Armourclad can be produced using selected patterns in the DecorVue range.

**Sizes**

Other sizes and thicknesses are available. Specific requirements should be referred to SmartGlass. It is imperative that SmartGlass be consulted regarding the lead times for supply of product.

Nominal thickness (mm)	Normal size limits (mm)
6	Min: 1200 x 300 Max: 2100 x 1600

**Drilling and edge working**

Armourclad cannot be cut or worked after it has been toughened because, with the balanced stresses set up in the glass during the toughening process, any working is likely to cause breakage. All work of this nature must therefore be completed before the glass is toughened.



African Merchant Bank, Johannesburg  
Architect: Moren Williams Lotter Forsythe  
Product: Armourclad green



PERFORMANCE	
Security Solutions	
Safety Solutions	+++
Solar Control Solutions	
UV Protection Solutions	
Sound Control Solutions	
Decorative Solutions	☀️
Building Aesthetics Solutions	🏢
Energy Efficiency Solutions	

Armourscreen® silk-screened, coloured, toughened safety glass can be custom-manufactured for a range of interior and exterior applications. Armourscreen can be screen-printed with specific logos or customised designs in one or two colours. The printed design is fused into the surface of the glass, ensuring the integrity of the material and its enduring colour-fastness.

Armourscreen can be used for flush-glazed curtain walling and entrance assemblies, as well as glass doors, internal partitions and squash court panels. Silk-screened glass protects against glare and solar heat radiation by reducing direct light transmission. This feature is a great advantage in overhead canopies and sun-facing curtain walls.

**Colours**

Standard colours: Etch White, White, Blue, Green, Grey, Black, Orange, Brown. Custom colours available on request.

**Sizes**

Thickness can range from 4 mm to 19 mm. It is imperative that SmartGlass be consulted regarding the lead times for supply of product. Varying production constraints apply to different sizes. Please refer specific requirements to SmartGlass.

Nominal thickness (mm)	Normal size limits (mm)	Approximate mass (kg/m²)
6	Min: 300 x 300 Max: 2000 x 3100	15

**Printing and finishing**

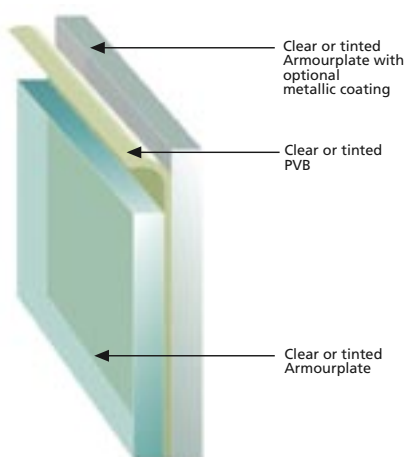
- Any two colours can be used on one piece of glass. The natural glass presents a third colour.
- Colours can be overprinted.
- Designs can be reversed out of colours.
- Designs can be printed up to 2 mm from the edge of the glass. This is important where design continuity is required in butt-jointed glass panels (e.g. curtain walling, partitions, balustrades etc.)
- Any type size can be printed.
- Edges can be bright polished for frameless installations.
- Further screening options are available on larger sizes of glass.
- Glass thickness can range from 4 mm to 19 mm.



Michelangelo Towers, Sandton  
Architect: Bentel Associates International  
Product: 6 mm White Armourscreen silk-screened, toughened safety glass



PERFORMANCE	
Security Solutions	
Safety Solutions	+++
Solar Control Solutions	☀️
UV Protection Solutions	
Sound Control Solutions	
Decorative Solutions	☀️
Building Aesthetics Solutions	🏢
Energy Efficiency Solutions	⚡️



ArmourLam™ combines the strength and safety of Armourplate toughened glass with the security, solar control and sound dampening features of laminated SmartGlass.

ArmourLam is manufactured by bonding polyvinyl butyral (PVB) interlayers between two pieces of Armourplate under heat and pressure. Customers can select any combination of tinted vinyls from the ColourVue range, as well as any coating from the Armourscreen, Solarshield, SolarVue and CoolVue ranges.

ArmourLam can be used where ordinary annealed glass would be likely to fracture due to high thermal stresses. Because ArmourLam is fully toughened, it can be supplied with boltholes for spider-fitting and other structural systems. This flexibility allows high-performance solar control in frameless glazing systems that appear transparent from the inside and sheer and flush from the outside.



Melrose Arch, Johannesburg  
Architect: Osmond Lange  
Product: 17.52 mm ArmourLam SolarVue Neutral



PERFORMANCE	
Security Solutions	⊗ ⊗ ⊗
Safety Solutions	⊕ ⊕ ⊕
Solar Control Solutions	☀ ☀ ☀
UV Protection Solutions	☀ ☀ ☀
Sound Control Solutions	👂 👂 👂
Decorative Solutions	🎨 🎨 🎨
Building Aesthetics Solutions	🏢 🏢 🏢
Energy Efficiency Solutions	⚡ ⚡ ⚡

**Installation**

ArmourLam may be a sided product, meaning that its appearance may vary when viewed from different sides. Please refer to "Cutting and glazing of sided products" on the first page of this brochure.

**Sizes**

Maximum sizes for specific thicknesses are outlined in the table below. Other thicknesses, sizes and combinations with body tinted glass and pyrolytic coatings are available on request. The maximum size that can be processed is 4000 mm x 2000 mm, subject to a maximum weight of 240 kg. Recommended maximum size will depend on application and design load.

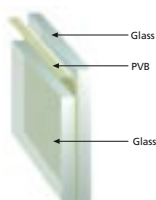
Normal thickness (mm)	Normal maximum sizes (mm)	Approximate mass (kg/m <sup>2</sup> )
9.52	3700 x 2000	20
11.52	3210 x 2000	25
13.52	3210 x 2000	30
17.52	3210 x 2000	40
21.52	3210 x 2000	50

INTRUDERPRUFE®

laminated safety glass



Clearwater Mall, Johannesburg  
Architect: Bentel Associates International  
Product: 8.38 mm Intruderprufe



Intruderprufe® laminated safety glass makes it significantly more difficult for criminals to intrude into a building or break through a shopfront. It also prevents a simple fall against a large window from turning into a tragic accident. In addition to these well-proven safety and security benefits, Intruderprufe blocks noise and harmful UV radiation.

**Performance ratings**

Intruderprufe is available in three performance variations:

1. Normal Strength (NS) for human impact safety (0.38 mm PVB interlayer)
2. High Penetration Resistant (HPR) for additional security (0.76 mm PVB interlayer)
3. High Impact (HI) for security in high-risk applications (1.52 mm PVB interlayer)

**Intrusion resistance**

Intruderprufe is tested by repeatedly dropping a 225 g steel ball from a height of nine metres. The impact of each drop is approximately equivalent to the blow from a hammer. The table shows the number of blows required to penetrate the glass

Laminate strength	NS	HPR	HI
Number of blows	3	8	24

NB: The size of the hole at penetration point is approximately 50 mm in diameter. Many more blows are required to gain access.

**Performance data summary**

Product		Visible Light		UV	Noise Control	Safety	Security
Nominal thickness (mm)	Strength	Transmission	Reflection	Elimination %	ISO9001 Rating / STC Value	Rating	Rating
6.38	NS	90	8	> 95	33	1	1
6.76	HPR	90	8	> 95	34	2	2
7.52	HI	90	8	> 95	34	3	3

**Sizes**

Nominal glass thickness (mm)	3.0	4.0	5.0	6.0
Intruderprufe NS thickness (mm)	6.38	8.38	10.38	12.38
Intruderprufe HPR thickness (mm)	6.76	8.76	10.76	12.76
Intruderprufe HR thickness (mm)	7.52	9.52	11.52	13.52
Standard sizes (mm)	2440 x 2000 2440 x 2134 2440 x 1830 3210 x 2250 3210 x 2440	3700 x 2440 3100 x 2440	3210 x 2250	3210 x 2250

Additional standard stock sizes are available on request. Recommended maximum size will depend on application and design load.



PERFORMANCE	
Security Solutions	⊗ ⊗ ⊗
Safety Solutions	⊕ ⊕ ⊕
Solar Control Solutions	
UV Protection Solutions	☀ ☀ ☀
Sound Control Solutions	👂 👂 👂
Decorative Solutions	
Building Aesthetics Solutions	🏢 🏢 🏢
Energy Efficiency Solutions	

ColourVue™ laminated glass products are made from various combinations of clear and tinted glasses and PVB (polyvinyl butyral) interlayers. ColourVue is available in a wide range of colours to meet a variety of aesthetic, glare reduction and solar control demands.

Coloured and patterned interlayers can be used individually or in various combinations to create colourful and distinctive glass facades, partitions and interiors. Because the patterns and colours are encapsulated between layers of glass, ColourVue is easier to keep clean than sandblasted glass, and it does not peel like applied vinyl.

ColourVue reduces damaging short-wave ultraviolet radiation and offers additional safety, security and noise control benefits. The lighter tints eliminate some solar energy and are intended for use in glazing areas where safety, glare control and aesthetic qualities are required. The deeper tints improve glare control and provide a higher degree of solar heat elimination

**Vanceva™ interlayers**

ColourVue with Vanceva™ Design Color interlayers is made under licence from Solutia™, the world leaders in polyvinyl butyral interlayer technology. Colours include light and dark shades of red, yellow, blue, black, and varying levels of translucent white. Patterns available on request. Vanceva™ is a trademark of Solutia Inc.

**Product range**

	6.38 mm NS	6.76 mm HPR	7.52 mm HI	8.38 mm NS	8.76 mm HPR	9.52 mm HI
Aquamarine	S	S	S	R	R	R
Deep Aquamarine		S	S		R	R
Arctic Snow White	S	S	S	R	R	R
Coolblue	S	S	S	R	R	R
Deep Coolblue		S	S		R	R
Coolbronze	S	S	S	R	R	R
Deep Coolbronze		S	S		R	R
Coolgrey	S	S	S	R	R	R
Deep Coolgrey		S	S	R	R	R
Coral Rose Red	S	S	S	R	R	R
Deep Red	S	S	S	R	R	R
Evening Shadow Black	S	S	S	R	R	R
Ruby Red	S	S	S	R	R	R
Sahara Sun Yellow	S	S	S	R	R	R
Sapphire Blue	S	S	S	R	R	R
Serene Green	R	R	R	R	R	R
Deep Serene Green	R	R	R			
Shadowlite 50	S			R		
Shadowlite 25	S	S		R	R	
Shadowlite 10		S	R		R	R
Regal Blue	S	S	S	R	R	R
Deep Regal Blue		S	S		R	R
True Blue	S	S	S	R	R	R
Standard sizes (mm)	2440 x 2000	2440 x 2000	2440 x 2000	3700 x 2440 3100 x 2440	3700 x 2440 3100 x 2440	3700 x 2440 3100 x 2440

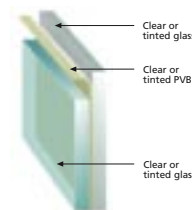
NS = Normal Strength; HI = High Impact;

HPR = High Penetration Resistant.

S = Available as standard; R = Available on request.  
Other thicknesses and extra deep tints are available on request.



Kitima Restaurant , Cape Town  
Architect: Roger Martin Architects and Interior Design



**PERFORMANCE**

Security Solutions	⊗ ⊗ ⊗ ⊗
Safety Solutions	⊕ ⊕ ⊕
Solar Control Solutions	☀
UV Protection Solutions	☀
Sound Control Solutions	🎧
Decorative Solutions	🎨
Building Aesthetics Solutions	🏢
Energy Efficiency Solutions	⚡

SolarVue™ provides medium solar control and a neutral, low-reflective appearance in a range of colours. A thin deposit of nickel and chromium eliminates more than 55% of solar heat, while transmitting more than 45% of visible light. SolarVue also eliminates more than 99% of damaging UV radiation.

**Suggested applications**

- Medium solar energy control
- Glare reduction in buildings
- Glazed partitions and screens

**Standards and options**

SolarVue is a PVB laminated safety glass marked to SABS 1263-1. SolarVue can be custom-manufactured to meet various safety, security and noise reduction standards.

**Coating densities**

- High Light (HL)
- Extra High Light (XHL)
- Super High Light (SHL)
- Mega High Light (MHL)

**Strength ratings**

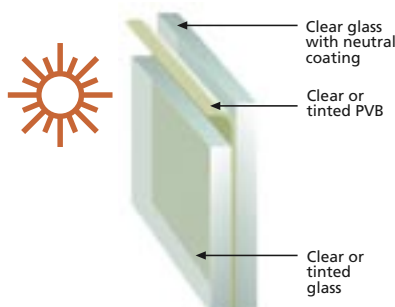
- Normal Strength (NS)
- High Penetration Resistant (HPR)
- High Impact (HI)

**NOTE:** SolarVue is a sided product. Please refer to "Cutting and glazing of sided products" on the first page of this brochure.

**Sizes**

	6.38 mm NS	6.76 mm HPR	7.52 mm HI	8.38 mm NS	8.76 mm HPR	9.52 mm HI
Aquamarine	S	S	S	S	S	S
Blue	S	S	S	S	S	S
Bronze	S	S	S	S	S	S
Grey	S	S	S	S	S	S
Neutral	S	S	S	S	S	S
Regal Blue	S	S	S	S	S	S
Serene Green	R	R	R			
Standard sizes (mm)	2440 x 2000	2440 x 2000	2440 x 2000	3100 x 2440 3700 x 2440	3100 x 2440 3700 x 2440	3100 x 2440 3700 x 2440

S = Available as standard; R = Available on request



Michelangelo, Johannesburg  
Architect: Bentel Associates International  
Product: 6.38 mm SolarVue Neutral HL



**PERFORMANCE**

Security Solutions	⊗ ⊗ ⊗ ⊗
Safety Solutions	⊕ ⊕ ⊕
Solar Control Solutions	☀
UV Protection Solutions	☀
Sound Control Solutions	🎧
Decorative Solutions	
Building Aesthetics Solutions	🏢
Energy Efficiency Solutions	⚡



St Anne's Hospital, Pietermaritzburg  
Architect: Basil Vogas  
Installation: Rainbow Skylights  
Product: Solarshield S10 Silver



PERFORMANCE	
Security Solutions	⊗ ⊗ ⊗
Safety Solutions	⊕ ⊕ ⊕
Solar Control Solutions	☀ ☀ ☀
UV Protection Solutions	☞ ☞ ☞
Sound Control Solutions	👂
Decorative Solutions	🎨
Building Aesthetics Solutions	🏢 🏢 🏢
Energy Efficiency Solutions	⚡ ⚡

Solarshield® makes it possible to create attractive buildings with highly efficient solar control. The combination of a metallic coating and a clear or tinted PVB (polyvinyl butyral) interlayer is designed primarily to keep out as much of the sun's heat as possible. In addition to reducing solar heat, Solarshield also limits the amount of light entering the interior and blocks up to 99% of damaging UV radiation.

Solarshield is a laminated safety glass marked to SABS 1263-1. It can be custom-manufactured to meet various safety, security and noise reduction standards. Solarshield is available in a range of colours and three densities of coating.

The numbers S10/S20/S30 refer to the light transmission of the coating, which in turn is directly proportional to the amount of solar heat entering the building. For example, S10 indicates 10% light transmission on coated glass prior to lamination.

**Suggested applications**

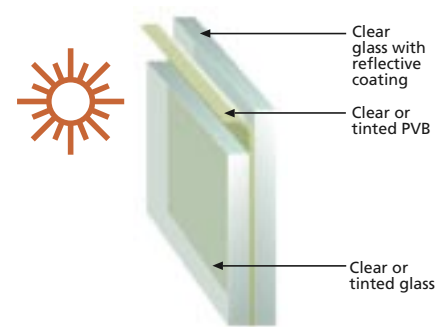
- Maximum solar energy control
- Curtain walls
- External solar screens
- Skylights
- Glare reduction in buildings
- Glazed partitions and screens
- 'One way' vision panels
- Reflective glass for wall cladding
- Decorative safety mirrors
- Lift interiors

**NOTE:** Solarshield is a sided product. Please refer to "Cutting and glazing of sided products" on the first page of this brochure.

**Sizes**

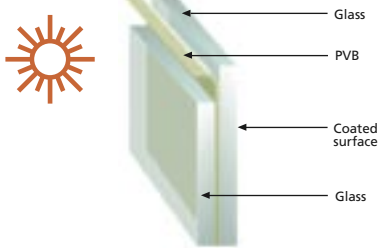
	6.38 mm NS	6.76 mm HPR	7.52 mm HI	8.38 mm NS	8.76 mm HPR	9.52 mm HI
Aquamarine	S	S	S	S	S	S
Blue	S	S	S	S	S	S
Bronze	S	S	S	S	S	S
Grey	S	S	S	S	S	S
Regal Blue	S	S	S	S	S	S
Serene Green	R	R	R			
Silver	S	S	S	S	S	S
Standard sizes (mm)	2440 x 2000	2440 x 2000	2440 x 2000	3700 x 2440 3100 x 2440	3700 x 2440 3100 x 2440	3700 x 2440 3100 x 2440

S = Available as standard;  
R = Available on request subject to order quantity  
Contact SmartGlass if another thickness is required.



**E RANGE™**

low emissivity safety glass



**NOTE:** E Range is a sided product with exposed coating requiring special cleaning techniques. Please refer to "Cutting and glazing of sided products" on the first page of this brochure.

SmartGlass E Range™ coated monolithic glass offers superior thermal insulation in standard frames designed for single glazing. E Range products reduce heating and air-conditioning costs by keeping more heat in during winter and blocking it out during summer.

Low E is a clear glass that maximises light transmission, while Solar E has a denser coating that controls solar heat radiation and glare. Both Low E and Solar E are available in Intruderprufe and Armourplate variants.

For the ultimate in insulating performance, E Range panels can be used in InsulVue double glazed units.

**Sizes**

	Nominal Thickness (mm)	Standard Max. Size (mm)
<b>TOUGHENED SAFETY GLASS</b>		
Armourplate Low E	6.0	3300 x 2000
Armourplate Solar E	5.0	3300 x 2000
<b>LAMINATED SAFETY GLASS</b>		
Aquamarine Low E	7.38	3300 x 2440
Deep Aquamarine Low E	7.76	3300 x 2440
Cool Blue Low E	7.38	3300 x 2440
Deep Cool Blue Low E	7.76	3300 x 2440
Cool Bronze Low E	7.38	3300 x 2440
Deep Cool Bronze Low E	7.76	3300 x 2440
Cool Grey Low E	7.38	3300 x 2440
Deep Cool Grey Low E	7.76	3300 x 2440
Intruderprufe Low E	7.38	3300 x 2440
Intruderprufe Solar E	6.38	3300 x 2440
Regal Blue Low E	7.38	3300 x 2440
Deep Regal Blue Low E	7.76	3300 x 2440
Serene Green Low E	7.38	3300 x 2440

Additional standard stock sizes and thicknesses are available on request. Recommended maximum size will depend on application and design load.



PERFORMANCE	Intruderprufe™ E Range	Armourplate™ E Range
	Security Solutions	⊗ ⊗ ⊗
Safety Solutions	⊕ ⊕ ⊕	⊕ ⊕ ⊕
Solar Control Solutions	☀ ☀ ☀	☀ ☀ ☀
UV Protection Solutions	☞ ☞ ☞	☞ ☞ ☞
Sound Control Solutions	👂	
Decorative Solutions		
Building Aesthetics Solutions	🏢 🏢 🏢	🏢 🏢 🏢
Energy Efficiency Solutions	⚡ ⚡	⚡ ⚡



Clearwater Mall, Johannesburg  
Architect: Bentel Associates International  
Product: SmartGlass Solar E coated glass

CoolVue® glass meets the growing demand for natural day lighting and building transparency, without the heat gain associated with ordinary clear glass. CoolVue can transmit more than 70% of visible light while blocking more than 50% of solar heat. CoolVue clear or tinted glass offers similar levels of heat reflection as Solarshield, but CoolVue provides lower visible reflectivity, which allows through-vision by day and at night.

CoolVue is manufactured by laminating a wave-length-selective heat-rejecting coating between two layers of PVB (polyvinyl butyral) and glass. CoolVue also reduces sound transmission, increases safety and security, and filters up to 99.5% of damaging short-wave UV radiation.

**Sizes**

Thickness	6.76 mm	6.76 mm	8.76 mm
Stock size (mm)	2440 x 2000	3210 x 2000	3210 x 2000
Clear	S	R	R
Serene Green	R	R	R
Grey	S	R	R
Regal Blue	S	R	R

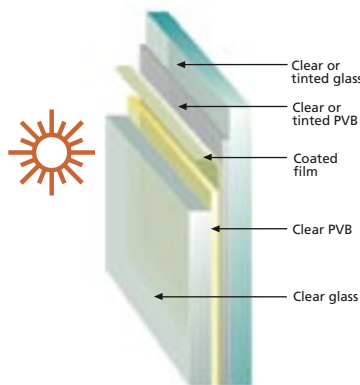
S = Available as standard;

R = Available on request subject to order quantity and sheet sizes. Additional sizes and thicknesses available on request.

*NOTE: CoolVue is a sided product, meaning that its appearance may vary when viewed from different sides. SmartGlass laminates and double glazing are labelled by the factory to indicate the coated side or the side that should face to the outside. Care must be exercised when cutting or glazing to achieve the desired performance and appearance. It is important that the coated side be identified before cutting stock sheets. CoolVue must be edge sealed prior to glazing. CoolVue must only be installed with the coating towards the sun.*



BMW dealership, Melrose Arch, Johannesburg  
Architect: Stafford & Associates  
Installation: Stirling Aluminium  
Product: CoolVue Clear



PERFORMANCE	
Security Solutions	☒ ☒ ☒
Safety Solutions	⊕ ⊕ ⊕
Solar Control Solutions	☀
UV Protection Solutions	☀
Sound Control Solutions	👂
Decorative Solutions	
Building Aesthetics Solutions	🏢
Energy Efficiency Solutions	⚡

ACTIV™

self-cleaning glass

Activ™ self-cleaning glass saves labour, reduces the risk of damage caused by cleaning equipment, and gives windows a better appearance for longer. Activ™ has a special titanium oxide coating that breaks down organic material.

Water also spreads evenly over the surface of the glass to form a thin film that washes away and dries off quickly without leaving unsightly drying spots. If it rains relatively regularly, the glass will be cleaned automatically. During dry spells Activ™ is easily cleaned by hosing down or wiping with a soft cloth and warm soapy water.

Although Activ™ has to be exposed to UV light to activate its unique properties, it does not need to be in direct sunlight. It continues working on cloudy days and during the night, and can be used in south-facing windows.

Activ™ coated glass can be laminated with any SmartGlass interlayers, and it can be combined with other coatings in the SmartGlass range, such as Solarshield, SolarVue and CoolVue.

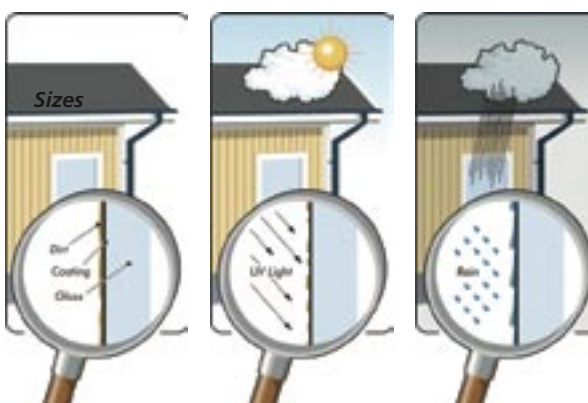
**Sizes**

Nominal glass thickness (mm)	3	4
NS laminate thickness (mm)	6.38	8.38
Standard size (mm)	3210 x 2250	3210 x 2250

6 mm Activ™ is available on request.  
4 mm Armourplate is also available.

For more information, visit [www.activglass.com](http://www.activglass.com)  
Activ™ is a trademark of Pilkington plc.

**How Activ™ works**



**FIGURE 1:** Coating is activated by UV light. After installation the special coating needs 5 to 7 days exposure to daylight to activate.

**FIGURE 2:** Organic dirt is broken down. The coating breaks down organic dirt and also reduces the adherence of inorganic dirt.

**FIGURE 3:** Rain washes dirt away. Water droplets spread out to form a 'sheet', dirt particles on surface are picked up by water and washed off glass.

**Technical notes**

Do not glaze Activ with silicone or with putty that contains linseed oil.

Activ™ is a sided product requiring the coating to be positioned to the outside. Please refer to "Cutting and glazing of sided products" on the first page of this brochure.



Activ™ self-cleaning glass reduces maintenance costs and the risk of damage during cleaning.

PERFORMANCE	
Security Solutions	
Safety Solutions	
Solar Control Solutions	
UV Protection Solutions	
Sound Control Solutions	
Decorative Solutions	
Building Aesthetics Solutions	🏢
Energy Efficiency Solutions	



Airport Sun InterContinental Hotel, Johannesburg  
Architect: Louis Karol Architects  
Installation: Technoclad



PERFORMANCE	
Security Solutions	⊗ ⊗ ⊗
Safety Solutions	⊕ ⊕ ⊕
Solar Control Solutions	
UV Protection Solutions	~ ~ ~
Sound Control Solutions	👂 👂 👂
Decorative Solutions	
Building Aesthetics Solutions	🏢
Energy Efficiency Solutions	⚡ ⚡ ⚡

Soundprufe™ laminated safety glass is manufactured with a special vinyl interlayer that offers better sound control than traditional polyvinyl butyral (PVB) interlayers.

The sound control rating of glass is expressed as a weighted sound reduction index ( $R_w$ ) measured in decibels (dB). Conventional laminated glass with a single normal strength (NS) vinyl interlayer is rated at 33 dB. A high penetration resistant (HPR) interlayer can improve the rating to 34 dB.

Soundprufe with a 0.76 mm HPR interlayer is rated at 38 dB and provides a noticeable improvement in sound reduction. Soundprufe also works better at lower temperatures because the Soundprufe interlayer retains its sound reducing properties better than traditional PVB interlayers.

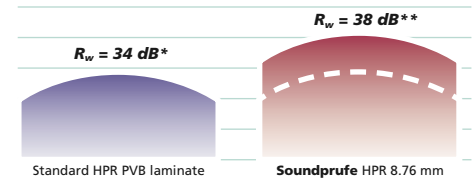
In addition to a better weighted sound reduction index, Soundprufe offers superior dampening across the coincidence dip – a frequency range in which glass of a specific thickness typically becomes more transparent to sound waves.

**Thickness and sheet sizes**

Nominal glass thickness (mm)	3.0	4.0
Soundprufe HPR thickness (mm)	6.76	8.76
Standard sizes (mm)	3210 x 2250	3210 x 2250

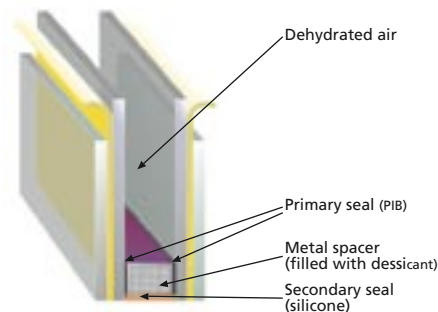
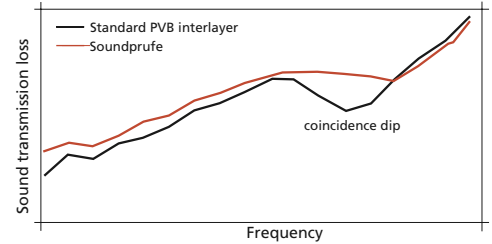
Additional standard stock sizes are available on request. Recommended maximum size will depend on application and design load.

**Superior sound reduction index**



HPR = High Penetration Resistant  
\* Tested by Laboratorium voor Akoestiek (Leuven, Belgium)  
\*\* Tested by Fraunhofer Institut für Bauphysik (Stuttgart, Germany)

**Sound control across the coincidence dip**



NOTE: InsulVue may be a sided product. Please refer to "Cutting and glazing of sided products" on first page of this brochure.



PERFORMANCE	
Security Solutions	⊗ ⊗ ⊗
Safety Solutions	⊕ ⊕ ⊕
Solar Control Solutions	☀ ☀ ☀
UV Protection Solutions	~ ~ ~
Sound Control Solutions	👂 👂 👂
Decorative Solutions	
Building Aesthetics Solutions	🏢
Energy Efficiency Solutions	⚡ ⚡ ⚡

InsulVue® double glazed units are manufactured from two or more panes of glass held apart by a metal spacer and bonded with a primary and secondary seal. Dehydrated air is trapped between the glass panes.

InsulVue is available in glass combinations that offer a wide range of performance characteristics and appearances.

Clear InsulVue is almost transparent to radiant solar heat, but solar control can be enhanced by replacing the outer glass with a suitable performance glass. InsulVue units incorporating glass from the E Range provide the best thermal insulation.

**Physical properties**

Thickness (mm)	Air Space (mm)	Maximum Standard Size (mm)	Approximate Mass (kg/m²)
19	6	3000 x 1000	32
25	12	3000 x 2000	32

NOTE: For efficient insulation, a 6 mm air space should not be used where the minor dimension exceeds 1 000 mm.

A thermal stress evaluation must be requested when glass with a high heat absorption is utilised in the unit.

Temperature and atmospheric pressure fluctuations are likely to cause distorted reflections when a reflective glass is incorporated in InsulVue.

Sizes in excess of 3000 mm x 2000 mm are available on request.



Pretoria East Hospital  
Architect: Basil Vogas  
Installation: Rene Turck & Associates

SmartGlass Images® copper-free mirror is priced at the same level as ordinary mirror, but it offers several advantages, including long-lasting tarnish resistance and an extended warranty.

SmartGlass Images is manufactured to ISO 9001:2000 quality management standards using a patented process that eliminates copper and lead from waste water and dramatically reduces the discharge of ammonia. The manufacturing process also complies with the ISO 14000 standard for environmental management.

ISO standard tests prove that SmartGlass Images will last three times longer than ordinary mirror. The palladium backing provides significantly improved resistance to edge corrosion and paint blistering caused by moisture, salts, acids and ammonia found in many cleaning products. Images is also quicker to fit because less time is required for edge working.

SmartGlass manufactures Images mirror in a variety of sizes and thicknesses using a range of glass types. Edges may be bevelled and polished to alleviate sharp corners and enhance aesthetics.



Melrose Arch Hotel, Johannesburg  
Architect: TPC

**Sizes**

Description	Sizes available (mm)
3.0 mm Silver Mirror	1830 x 1220
	2440 x 1830
	2440 x 2000
	2440 x 2134
4.0 mm Silver Mirror	2440 x 1830
	2440 x 2134
	3210 x 2440
5.0 mm Silver Mirror	2440 x 1830
	3210 x 2250
Venetian Strip	Available on request

P E R F O R M A N C E	
Security Solutions	
Safety Solutions	
Solar Control Solutions	
UV Protection Solutions	
Sound Control Solutions	
Decorative Solutions	
Building Aesthetics Solutions	
Energy Efficiency Solutions	

**SMARTGLASS SOLUTIONS**

	ClearVue™	DecorVue®	DecorLam™	Armourplate®	Armourclad®	Armourscreen®	ArmourLam™	Intruderplate™ e.range	Intruderprufe™	Soundprufe™ e.range	ColourVue™	SolarVue™	SolarVue™	CoolVue®	InsuVue®	Images®	Activ™	
<b>SECURITY</b>																		
<b>SAFETY</b>																		
<b>SOLAR CONTROL</b>																		
<b>UV PROTECTION</b>																		
<b>SOUND CONTROL</b>																		
<b>DECORATIVE</b>																		
<b>BUILDING AESTHETICS</b>																		
<b>ENERGY EFFICIENCY</b>																		

<b>P E R F O R M A N C E</b>	<b>Excellent</b>	<b>Good</b>
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- SmartGlass is proud to be a South African company. Our local experts are experienced with local conditions and have developed solutions that are ideal for South African applications. SmartGlass customers benefit in several ways:
- Replacement glazing is easy to source. For example, the glass used in extensions to the South African Reserve Bank building was matched 15 years after the original project was completed.
- Multiple stock sizes are available and customers can order as little as a single sheet.
- Locally manufactured products can be delivered within 48 hours in Gauteng and within 7 days in the rest of the country.

# LIGHT TRANSMISSION & SHADING COEFFICIENT

*laminated glass*

## Glass selection

As different types of glass are better suited to different applications, the intended use of a space must be taken into account when selecting glass. In assessing the performance and suitability of glass for a specific application, two key measures to consider are shading coefficient and visible light transmission.

## Shading coefficient

The ratio of total solar energy transmission of a glass compared to the total solar energy transmission of ordinary 3 mm glass (calculated to ASHRAE summer conditions). The higher the shading coefficient, the more solar heat is allowed into the building. This measurement is dependent on environmental factors such as wind, as well as the temperature inside and outside.

## Visible light transmission

The percentage of visible light transmitted through the glass when the sun shines at right angles to the surface of the glass. Higher visible light transmission makes a building look more transparent from the outside, and makes the interior lighter and airier, increasing the productivity of retail and educational spaces. However, high light transmission may detract from the restfulness of a space and reduce office productivity by increasing glare on work surfaces and walls, and reducing visibility of computer and TV screens.

