

SGG PLANITHERM<sup>®</sup> TOTAL<sup>+</sup>

*New generation  
advanced performance  
low-E glass*



# SGG PLANITHERM® TOTAL+

## *New generation advanced performance low-E glass*

SGG PLANITHERM TOTAL+ represents the next generation of low-emissivity (low-E) coating technology and is an evolution of the UK and Ireland's leading low-E coating brand, SGG PLANITHERM TOTAL.

SGG PLANITHERM TOTAL+ is a revolutionary high performance low-E glass. Developed specifically for the particular needs of the UK market, SGG PLANITHERM TOTAL+ has been optimised for Window Energy Ratings (WERs) making it the most energy efficient low-E glass available today.

Using the very latest advancements in magnetron coating technology from Saint-Gobain Glass, it combines many of the processing qualities of traditional hard coat products with the superior performance and aesthetics of the SGG PLANITHERM range. The unique coating is stable during the tempering process, making it the world's first 'single stock' offline coated low-E range for use in annealed or toughened form.

### Applications

SGG PLANITHERM TOTAL+ is an extremely versatile low-E solution suitable for a wide range of domestic and commercial applications:

#### **Domestic**

- Windows and skylights
- Patio doors, french doors and other external doors
- Conservatories and sun rooms

#### **Commercial**

- Façades / windows
- Curtain walling
- Structural glazing
- Overhead glazing

### Description

SGG PLANITHERM TOTAL+ is manufactured on Saint-Gobain Glass UK's magnetron coater. A unique combination of multiple metal oxide layers are applied to high quality SGG PLANILUX clear float glass using a magnetically enhanced cathodic sputtering process under vacuum conditions. The resultant microscopically thin and transparent metallic coating very effectively reflects long-wave heat radiation back into a room, thereby retaining heat within a building, whilst maximising natural light transmission.



## Advantages

SGG PLANITHERM TOTAL+ offers a number of key benefits that clearly differentiate it from other low-E products, helping to give processors and window fabricators an added edge in an increasingly discerning and competitive market:

### Benefits for glass processors

- SGG PLANITHERM TOTAL+ is a 'single stock' product; the same version can be used in either annealed or toughened form. This significantly reduces stockholdings, reducing working capital, freeing up warehouse space, as well as simplifying logistics and production planning.
- The SGG PLANITHERM TOTAL+ coating is durable and easy to process helping to ensure the highest levels of quality of finished units.
- Depending on the type of furnace and settings, SGG PLANITHERM TOTAL+ may offer improved toughening cycle times and/or reduced cycle temperatures, helping to improve throughput and lower energy costs.
- As a durable, single version product, SGG PLANITHERM TOTAL+ can help to improve processing optimisation in terms of cutting, planning, and 'right first time' yields.
- Produced at the Saint-Gobain Glass UK float plant in Eggborough on the new magnetron coater, SGG PLANITHERM TOTAL+ is available in a full range of thicknesses and dimensions.

### Benefits for fabricators / consumers

#### Enhanced Thermal Insulation

Double glazed units incorporating SGG PLANITHERM TOTAL+ offer up to three times more insulation than standard double glazing and significantly better thermal insulation compared to hard coated low-E products:

- Considerable reductions in heating bills
- Eliminates cold areas around windows
- Reduced condensation on the inner pane
- Environmentally friendly solution, given the lower CO<sub>2</sub> emissions associated with reduced energy consumption
- Ensures compliance with current and future requirements of Document L of the Building Regulations in England and Wales for all frame types or designs
- Exceptional Window Energy Rating performance thanks to the optimised balance between a very low U-value and high solar gain (see overleaf)

### Neutral Appearance

The SGG PLANITHERM coating is remarkably neutral in both transmission and reflection as opposed to traditional hard coated low-E products which typically suffer from a noticeable tint:

- White curtains remain looking white from outside
- No discolouration of Georgian bars

### Exceptional Clarity

SGG PLANITHERM TOTAL+ offers a high level of light transmittance, maximising the entry of natural daylight into the building. This type of coating also benefits from the lack of 'haze effect' commonly associated with hard coated products.

### SGG PLANITHERM TOTAL+

U-value

**1.2 W/m<sup>2</sup>K**

(4(16)4 unit with 90% argon gas filling)

Light Transmittance

**80%**

Light Reflectance

**12%**

Solar Factor

**71%**





## Product Range

### Stock Sizes

SGG PLANITHERM TOTAL+	
Thickness	Standard Sizes
4-6-8-10 mm	6000 x 3210 mm
	2550 x 3210 mm
	2250 x 3210 mm

### Toughened Glass

SGG PLANITHERM TOTAL+ is the first offline coated low-E glass that can be used as a single version in both annealed and toughened form. Critically, once toughened, the coating retains the

same technical characteristics and aesthetic qualities. For applications requiring safety glass SGG PLANITHERM TOTAL+ can be readily toughened to meet the requirements of BS EN 12150.

### Laminated Glass

SGG PLANITHERM TOTAL+ is available as SGG STADIP and SGG STADIP PROTECT laminated glass in most common configurations. Laminated glass offers safety and security performance as well as UV filtration.

## Product Combinations

By combining SGG PLANITHERM TOTAL+ with other specialist glass products available from the Saint-Gobain Glass range, a multitude of high performance, multi-functional double glazing solutions can be achieved.

### Solar Control Glazing

The SGG COOL-LITE family presents an extensive range of solar control solutions, designed to reduce solar heat gain, thereby reducing reliance on ventilation and air conditioning systems. In particular, the extremely versatile SGG COOL-LITE ST is toughenable from stock and when combined with SGG PLANITHERM TOTAL+ provides an ideal solution for conservatory roof applications.

### Low-maintenance Glazing

SGG BIOCLEAR can be combined with SGG PLANITHERM TOTAL+ to add effective self-cleaning properties to a double glazed unit. This product combination offers a significantly more neutral and less reflective solution compared to equivalent products currently available on the market.

### Acoustic Glazing

SGG STADIP SILENCE is an acoustic PVB laminated glass, which noticeably reduces noise whilst also offering the same safety and security characteristics as laminated glass. It presents an ideal complement to SGG PLANITHERM TOTAL+ in double glazed conservatory roofs, for example.

### Vision Control

SGG DECORGLASS is a range of traditional patterned glass with varying obscuration levels which can be combined with SGG PLANITHERM TOTAL+ to offer privacy in various applications.

SGG MASTERGLASS (a range of contemporary geometric textured glass) and SGG SATINOVO (acid-etched glass) offer further design possibilities for commercial or domestic applications.

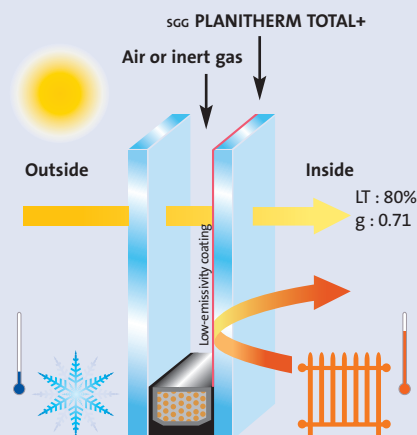
## Processing Guidelines

SGG PLANITHERM TOTAL+ must always be assembled into a double glazed unit. The coating is generally placed on face 3 of the unit, though it is possible to place the coating on face 2 without affecting the U-value.

Appearance may vary slightly, so it is important to maintain consistent coating positioning throughout a particular façade.

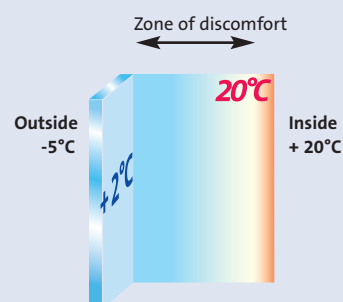
Full guidance on handling and processing SGG PLANITHERM products are detailed in a separate document available from Saint-Gobain Glass UK.

### Double glazed unit with SGG PLANITHERM TOTAL+



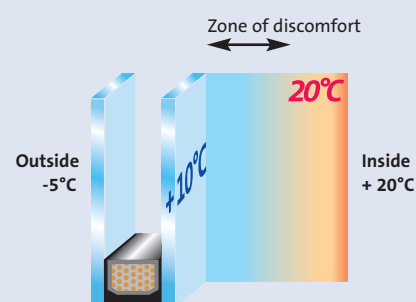
### Temperature of the inner pane

4 mm single glazing



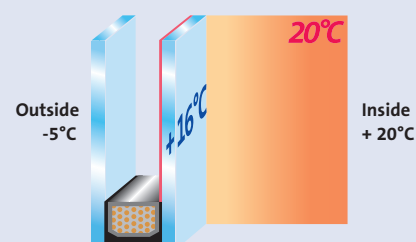
### Standard clear float double glazed unit

4 (Air 12) 4 mm



### Double glazed unit with SGG PLANITHERM TOTAL+

4 (90% Argon 16) 4 mm



## Building Regulations

SGG PLANITHERM TOTAL+ is the ideal low-E solution for compliance with Building Regulations relating to energy efficiency in England, Wales and the Republic of Ireland (Part L), Scotland (Section 6) and Northern Ireland (Part F).

### Whole Window U-values

Thanks to its superior thermal insulating performance, SGG PLANITHERM TOTAL+ enables a wider range of frame types and designs to meet mandatory maximum and/or area weighted average whole window U-value requirements, affording greater flexibility to architects, specifiers and fabricators.

### Window Energy Ratings

With its optimised balance of very low emissivity and high solar gain SGG PLANITHERM TOTAL+ is the most energy efficient low-E glazing product available under the BFRC window energy rating scheme, performing significantly better than other low-E products.

Independent simulations show that when incorporated in a typical window with a 30% frame factor, SGG PLANITHERM TOTAL+ can improve the BFRC energy index by approximately 13 kWh/m<sup>2</sup>/year when compared to hard glazing and at least 5 kWh/m<sup>2</sup>/year improvement over other leading low-E products. This performance advantage can help fabricators and installers comfortably meet the proposed Window Energy Rating band C (or better) requirements of Document L of the Building Regulations using standard double glazed units for the majority of windows. A and B ratings are also more easily achievable, allowing for application to be endorsed by the Energy Savings Trust (see overleaf).

## Technical Specifications

SGG PLANITHERM TOTAL+ performance data			
Internal Pane		SGG PLANITHERM TOTAL+	
External Pane		SGG PLANILUX clear float glass	SGG DIAMANT
Composition	mm	4 - 16 - 4	4 - 16 - 4
Position of Coating			
• low-emissivity coating		3	3
Light Factors			
LT (Light transmittance)	%	80	81
LRe (External reflection)	%	12	12
LRi (Internal reflection)	%	12	12
Solar Radiant Heat Factors			
T (Solar radiant heat transmittance)	%	60	63
Re (External solar radiant heat reflectance)	%	19	22
A1 (Solar radiant heat absorbance/Ext)	%	9	3
A2 (Solar radiant heat absorbance/Int)	%	11	13
Solar Factor			
g EN 410		0.71	0.74
Shading Coefficient		0.81	0.85
U-value*			
Air filled cavity	W/(m <sup>2</sup> K)	1.4	1.4
90% argon filled cavity (EN1279)	W/(m <sup>2</sup> K)	1.2	1.2

\*Centre-pane U-values have been rounded in accordance with EN 673.

For Window Energy Ratings simulators should calculate whole window U-values from first principals using normal surface emissivity ( $\epsilon = 0.05$ ).

Saint-Gobain Glass UK has won The Sunday Times national award for training and motivation of staff on environmental issues and has also been named as one of the UK's greenest companies in The Sunday Times Green List for two consecutive years.



Choose the most energy efficient glass from one of the UK's greenest companies.



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## Energy Saving Trust

The Energy Saving Recommended logo has been developed by the Energy Saving Trust to distinguish the most energy efficient products on the market.

The Energy Saving Trust is an independent, non-profit making organisation backed by the Government. Its' aim is to cut emissions of carbon dioxide (CO<sub>2</sub>) - the main greenhouse gas causing climate change - by promoting the sustainable and efficient use of energy.

Windows with a B rating or higher are eligible to be endorsed by the Energy Saving Trust and (subject to approval) to use the Energy Saving Recommended logo.



High performance low-E glass products such as SGG PLANITHERM TOTAL+ are recognised as being an essential component in improving the energy efficiency of windows and can help windows to qualify for Energy Saving Recommended status.

SGG PLANITHERM TOTAL+ is rapidly becoming recognised at the low-E glass of choice in order to achieve the best possible Window Energy Ratings.

Distributor

SGG BIOCLEAR, SGG COOL-LITE, SGG DECORGLASS, SGG MASTERGLASS, SGG PLANILUX, SGG PLANITHERM, SGG STATINOVO, SGG STADIP, SGG STADIP PROTECT, SGG STADIP SILENCE and all other devices and logos are registered trademarks of Saint-Gobain.