

SAINT-GOBAIN GLASS COMFORT *Enhanced thermal insulation*

SGG PLANITHERM® TOTAL

New generation advanced performance low-E glass

SGG PLANITHERM TOTAL is the most advanced of a new generation of low-E products belonging to the SGG PLANITHERM family, Europe's best selling low-emissivity (low-E) glass and the UK's market leading offline coating brand.

Developed for the particular needs of the UK market, SGG PLANITHERM TOTAL incorporates the very latest advancements in magnetron coating technology from Saint-Gobain Glass to combine many of the processing qualities of traditional hard coat products with the superior performance and aesthetics of the SGG PLANITHERM range.

SGG PLANITHERM TOTAL is a revolutionary range of high performance low-E glass products. The unique coating is the most durable of its kind and completely 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 CO₂ emissions associated with reduced energy consumption
- Ensures compliance with Document L of the Building Regulations in England and Wales for all frame types or designs via the 'centre-pane U-value' option
- Superior 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/m²K
(4(16)4 unit with 90% argon gas filling)

Light Transmittance
79%

Light Reflectance
12%

Solar Factor
66%

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 compliment 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.

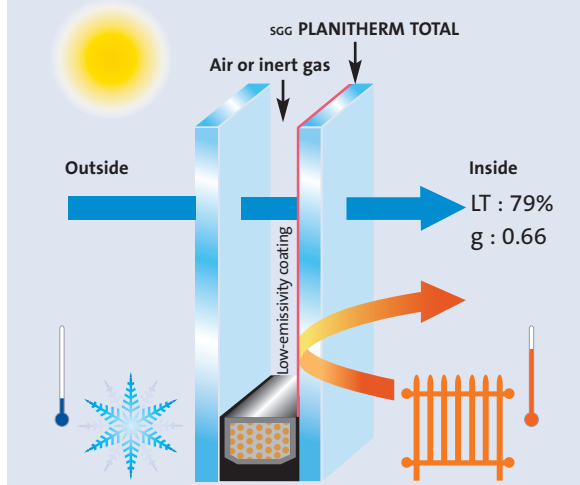
Processing Guidelines

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.

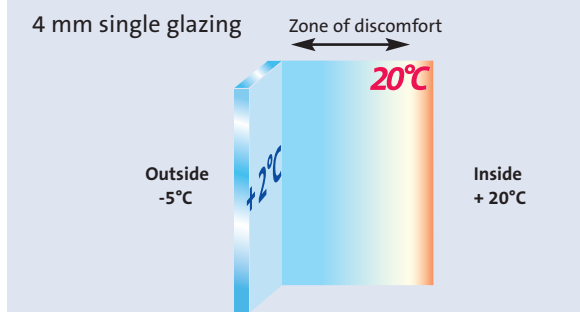
Appearance may vary slightly, so it is important to maintain consistent coating positioning throughout a particular façade.

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

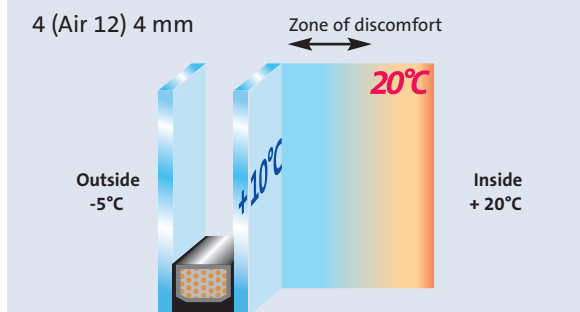
Double glazed unit with SGG PLANITHERM TOTAL



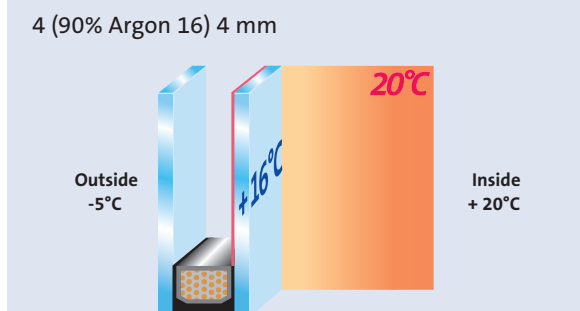
Temperature of the inner pane



Standard clear float double glazed unit



Double glazed unit with SGG PLANITHERM TOTAL



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 (Document L), Scotland (Document J) and Northern Ireland (Document 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.

Centre-pane U-values

With an optimal centre-pane U-value of 1.2 W/m²K SGG PLANITHERM TOTAL meets the alternative centre-pane method of compliance for replacement windows in England and Wales (no worse than 1.2 W/m²K). This alternative method of compliance means that the thermal performance of the frame no longer needs to be taken into account eliminating the necessity for costly testing and/or calculation.

Window Energy Ratings

With its optimised balance of very low emissivity and high solar gain SGG PLANITHERM TOTAL is one of the most energy efficient low-E glazing products available under the BFRC window energy rating scheme, performing significantly better than traditional 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 8 kWh/m²/year when compared to hard coated low-E glazing, a performance advantage equivalent to changing the outer pane from float to low-iron glass. It can therefore go a long way towards helping standard windows achieve the Window Energy Rating band C (or better) required to be endorsed by the Energy Savings Trust (see overleaf).

Technical Specifications

| SGG PLANITHERM TOTAL performance data | | | | | |
|--|----------------------|--------------------------------|-------------|--------------|------------------|
| Internal Pane | External Pane | SGG PLANITHERM TOTAL | | | |
| | | SGG PLANILUX clear float glass | SGG DIAMANT | SGG BIOCLEAR | SGG COOL-LITE ST |
| Composition | mm | 4 -16 - 4 | 6 -16 - 6 | 4 -16 - 4 | 4 -16 - 4 |
| Position of Coating | | | | | |
| • low-emissivity coating | | 3 | 3 | 3 | 3 |
| • solar control coating | | N/A | N/A | N/A | 2 |
| • self-cleaning coating | | N/A | N/A | 1 | N/A |
| Light Factors | | | | | |
| LT (Light transmittance) | % | 79 | 77 | 80 | 76 |
| LRe (External reflection) | % | 12 | 12 | 12 | 15 |
| LRi (Internal reflection) | % | 12 | 12 | 12 | 14 |
| Solar Radiant Heat Factors | | | | | |
| T (Solar radiant heat transmittance) | % | 56 | 52 | 60 | 55 |
| Re (External solar radiant heat reflectance) | % | 21 | 19 | 25 | 24 |
| A1 (Solar radiant heat absorbance/Ext) | % | 12 | 17 | 2 | 10 |
| A2 (Solar radiant heat absorbance/Int) | % | 11 | 12 | 13 | 11 |
| Solar Factor | | | | | |
| g EN 410 | | 0.66 | 0.63 | 0.71 | 0.65 |
| Shading Coefficient | | 0.76 | 0.73 | 0.81 | 0.74 |
| U-value* | | | | | |
| Air filled cavity | W/(m ² K) | 1.4 | 1.4 | 1.4 | 1.4 |
| 90% argon filled cavity (EN1279) | W/(m ² K) | 1.2 | 1.2 | 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 (ε = 0.04).

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 (CO₂) - the main greenhouse gas causing climate change - by promoting the sustainable and efficient use of energy.

Windows with a C 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 the low-E glass of choice in order to achieve the best possible Window Energy Ratings.



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New generation
advanced performance
low-E glass



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