

Pilkington Thermal Insulation range

Pilkington K Glass™
Pilkington Optitherm™



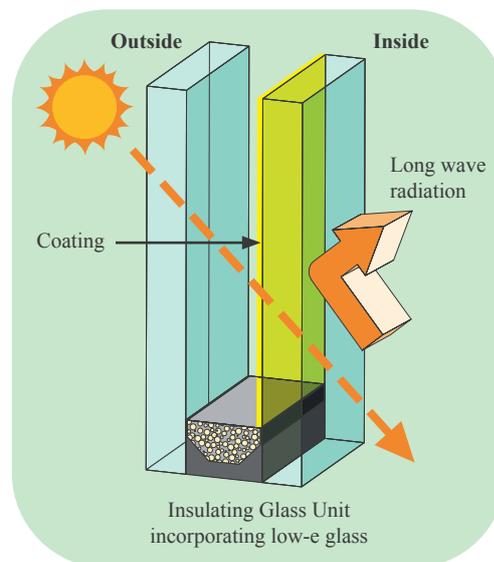
PILKINGTON
NSG Group Flat Glass Business



Pilkington Optitherm™ S3

Introduction to low-emissivity glass

Glass features heavily in modern building design. For both aesthetic and practical reasons it is as popular as ever. However, today's builders, regulators and wider communities are demanding more from glass. In particular, the focus on energy efficiency and tighter European Regulations are creating a greater need for low-emissivity (low-e) glass. Through advances in low-e glass, windows now play a big part in energy conservation and comfort, minimising heat loss and internal condensation. We are here to help you meet all your energy saving requirements – with the widest range of low-e glass available.



A guide to measuring the effectiveness of low-emissivity

Solar energy enters the building mainly as short wave radiation, but once inside, it is reflected back by objects towards the glass as long wave radiation. Low-e glass has a coating that provides an effective barrier to heat loss, by allowing a much higher transmission of short wave radiation (from the sun) than long wave radiation (from heaters and objects in the room).

The measure of heat loss is usually expressed in terms of U-value. This is the rate of heat loss in Watts per square metre per degree Kelvin temperature difference, between the inside and outside (expressed as W/m^2K). The lower the U-value, the better the insulation the product provides.

How it works

Essentially, low-e glass reflects energy back into a building to achieve much lower heat loss than ordinary float glass. In addition, different types of low-e glass allow different amounts of passive solar heat gain, which helps reduce heating requirements and costs, especially in colder months.

To maximise energy efficiency all year round, the ideal glazing solution often combines solar control and thermal insulation.

Your options for achieving good energy efficiency

With Pilkington products, you can achieve good energy efficiency in two different ways:

- you can use a single product which provides both solar control and thermal insulation in an Insulating Glass Unit;
- you can combine a solar control product and a separate low-e product within an Insulating Glass Unit.

A full range of low-emissivity products

Our low-e products range is designed to offer you a solution, whatever your requirements:

- Pilkington **K Glass™** is our on-line low-e coated product;
- Pilkington **Optitherm™** is an off-line low-e coated product, ideal for extremely low U_g -value needs;
- Pilkington **Eclipse Advantage™** and Pilkington **Suncool™** are respectively on-line and off-line coated products; they are primarily solar control products, but have low-e properties too.

If you would like to know more about our solar control products, please ask our team for the “Pilkington Solar Control range” brochure.



Pilkington **Optitherm™** S3

Calculating tool – available online.

To help you calculate the parameters of Insulating Glass Units, we have developed the Pilkington Spectrum software. You simply select the components of the glass units, and the programme automatically calculates the main parameters and displays them graphically. You can also print technical datasheets for the specific combination you need.

You can access this tool by registering on-line at www.pilkington.com/spectrum

Pilkington **Optitherm™** S3 and
Pilkington **Optilam™** Therm S3





Pilkington low-emissivity range

We offer two types of low-e coating:

- on-line coatings, which are applied during glass manufacture, such as Pilkington **K Glass™**;
- off-line coatings, which are applied afterwards, such as Pilkington **Optitherm™**.

Why use on-line coated products?

Generally speaking, on-line coated products offer lower thermal insulation levels than off-line coated products. However, they have a range of other benefits; they are easier to handle and process, and can be toughened or laminated without difficulty. They are also far more durable and achieve a higher degree of passive solar gain (g value, the proportion of solar radiation transmitted through the glass by all means) which is particularly beneficial in cool but sunny conditions.

Pilkington K Glass™

Compared to conventional insulation glazing with clear float glass, Pilkington **K Glass™** offers substantial improvements on thermal insulation. In terms of energy savings its results are very good too. It retains heating warmth in a room while allowing high levels of solar energy to enter and this helps to reduce heating costs.

This on-line coated glass can be toughened, laminated, bent, used in monolithic applications or it can be processed to make Insulating Glass Units (IGUs).

As it does not have to be edge-stripped, the process of manufacturing this glass into Insulating Glass Units is extremely fast and economical.

Product features summary:

- substantially improved thermal insulation compared to conventional insulation glazing with a U_g -value of 1.5 W/m²K in 4-16-4 standard constructions with argon (90%);
- high solar gain for overall energy saving performance;
- available in a range of different sizes and thicknesses (3 mm, 4 mm, 5 mm and 6 mm) for various applications;
- no edge-stripping necessary for economical manufacturing;
- an all-round solution which can be toughened, laminated and bent;
- robust in processing;
- ideal balance between thermal insulation and solar heat gain.

Why use off-line coated products?

Most off-line coated products are able to give higher levels of thermal insulation and light transmittance, but they do require extra care in handling and processing. We can supply them in toughened and laminated form by applying the coating to pre-processed glass. Some can also be provided in toughenable form.

Pilkington Optitherm™

This range of high quality clear float glass has a transparent low-e coating which has been specially developed for use in Insulating Glass Units.

Pilkington **Optitherm™** glass incorporates a thin magnetron sputtered coating, applied off-line. This coating needs to be edge-stripped before Insulating Glass Unit processing.

All products in this range are available in annealed, toughened and laminated form. They can also be combined with other Pilkington glass to provide additional benefits such as safety, security or noise control.

Pilkington Optitherm™ S3

Combining thermal insulation with great neutrality, Pilkington **Optitherm™** S3 has quickly become a market leading super neutral low-e glass.

Pilkington **Optitherm™** S3 must be incorporated in an Insulating Glass Unit, such as Pilkington **Insulight™**, with the coating on the inside surface. For safety or security applications, the glass can be toughened or laminated before coating. As well as having an impressive U_g -value of $1.1 \text{ W/m}^2\text{K}$, it offers very high light transmittance (80%) and low light reflectance (13%) to reduce energy consumption, even in the most aesthetically demanding environment.

For safety applications, we offer Pilkington **Optitherm™** S3 Pro T which should be toughened and is colour matched to Pilkington **Optitherm™** S3 after toughening.

Product features summary:

- U_g -value of $1.1 \text{ W/m}^2\text{K}$ in 4-16-4 standard constructions with argon (90%);
- super neutral in terms of light transmittance (80%) and low light reflectance (13%);
- available in a range of different sizes and thicknesses (from 4 mm to 10 mm*) for various applications;
- available in combination with Pilkington **Optilam™** for impact resistance and increased security or with Pilkington **Optiphon™** for improved noise reduction;
- colour-matched Pilkington **Optitherm™** S3 Pro T version offered for toughened applications;
- available with Pilkington **Activ™** coating for additional self-cleaning benefit.

*12 mm is available upon special request

Pilkington Optitherm™ S1

For applications requiring a U_g -value of $1.0 \text{ W/m}^2\text{K}$, we offer Pilkington **Optitherm™** S1. Despite its low U_g -value, this product still offers outstanding performance in terms of light transmission and colour neutrality. Pilkington **Optitherm™** S1 is the ultimate in thermal insulation for Insulating Glass Units and should be specified for any situation where excessive heat loss is a concern.

Product features summary:

- U_g -value of $1.0 \text{ W/m}^2\text{K}$ in 4-16-4 standard constructions with argon (90%);
- neutral in terms of light transmittance (70%) and medium light reflectance (21%);
- available in a range of different sizes and thicknesses (from 4 mm to 10 mm*) for various applications;
- available in combination with Pilkington **Optilam™** for impact resistance and increased security or with Pilkington **Optiphon™** for improved noise reduction.

*12 mm is available upon special request

If you would like more detailed information on Pilkington **Optitherm™** S1, please ask our team for the separate Pilkington **Optitherm™** S1 datasheet.



Pilkington **Optitherm™** S1

Pilkington **Optitherm™** S3



Pilkington Optitherm™ GS

Developed specifically for energy-optimised triple glazing, Pilkington **Optitherm™** GS maximises solar energy gain and reduces heat loss to increase the energy efficiency of houses.

Pilkington **Optitherm™** GS exceeds the criteria for Passiv Haus glazing, achieving a total solar energy transmittance (g value) of up to 63% whilst still attaining a U_g -value of as low as 0.6 W/m²K.

Product features summary:

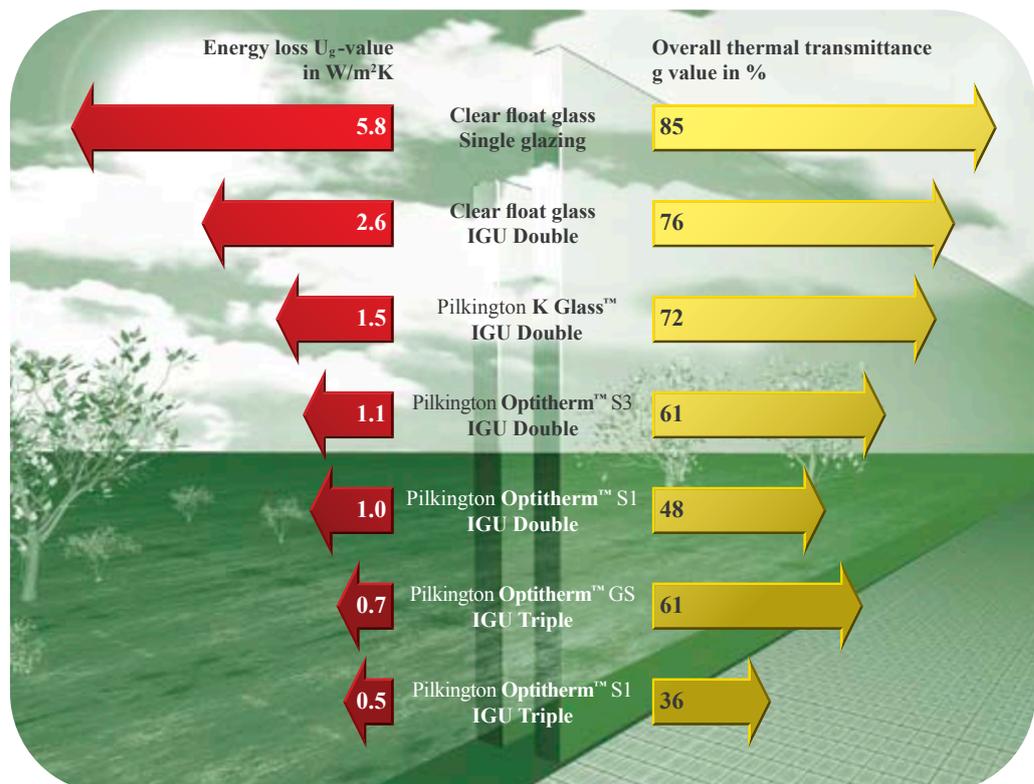
- specially designed for triple glazed units to meet and exceed Passiv Haus specifications;
- very low U_g -value of 0.6 W/m²K in a krypton filled Triple IGU;
- Excellent total solar energy transmittance (g value) maximising passive solar heat gain;
- neutral in terms of light transmittance (73%) and medium light reflectance (19%);
- available in a range of different sizes and thicknesses for various applications;
- available in combination with Pilkington **Optilam™** for impact resistance and increased security or with Pilkington **Optiphon™** for improved noise reduction.

The energy balance compared*:

If you would like more detailed information on Pilkington **Optitherm™** GS, please ask our team for the separate Pilkington **Optitherm™** GS datasheet.

Double and triple glazing options

When we discuss the performance of most of our products, we assume their incorporation into Insulating Glass Units (IGUs). Insulating Glass Units are glass panes separated by a gas-filled chamber and sealed around the edges. These units can incorporate two or three panes of glass to give double or triple glazing. By using additional panes of glass (i.e. triple glazing) we enhance the unit's thermal insulation properties. We can further enhance the overall thermal performance of the unit and window with the use of a warm edge spacer between the panes of glass and the choice of gas used to fill the cavity.



* Energy gains (overall thermal transmittance) and energy losses from single glazing to high-end thermal Insulating Glass Units. U_g -values are in accordance with EN 673, g values are in accordance with EN 410. Values for IGUs Double are based on 4-16-4 standard constructions with argon (90%). Values for IGUs Triple are based on 4-16-4-16-4 standard constructions with argon (90%).

Combination options

We are committed to developing new product combinations, giving you the flexibility to use them in a greater range of applications.

We offer products that combine thermal insulation with other benefits including safety, security, noise control and self-cleaning. Many low-e coatings are also available on Pilkington **Optiwhite™*** for higher light transmittance and g value.

And in addition to this, all glass types from our low-e glass range can be combined with the appropriate Pilkington Spandrel Glass to obtain an architecturally harmonious look.

* Pilkington **Optiwhite™** is a low iron glass with improved light and solar properties. It can be used as a substrate for many Pilkington low-e products or on its own to take advantage of desirable solar heat and light transmittance.

About us

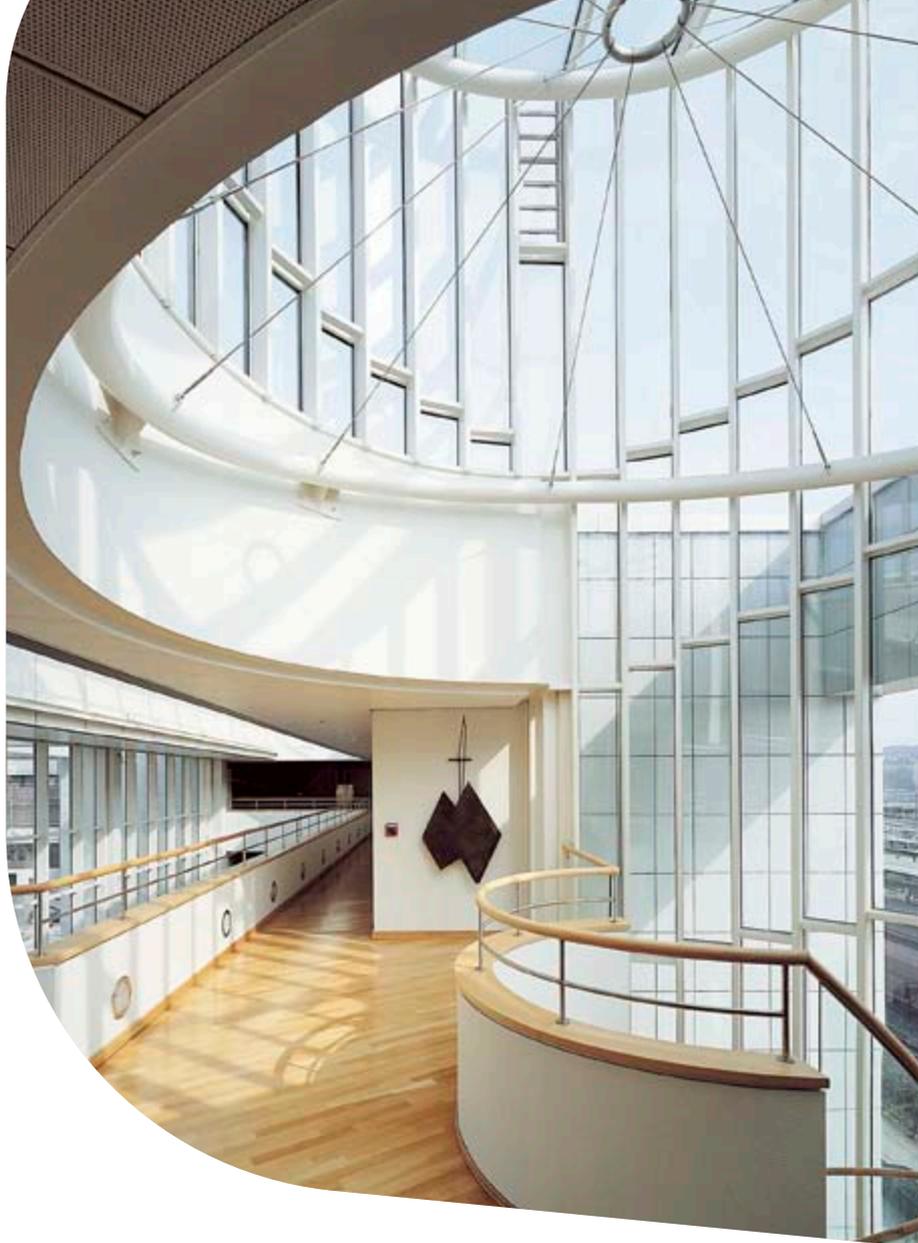
We have been manufacturing and processing glass since 1826. This experience has been invaluable and has enabled us to invest in and develop our ideas into world leading products.

Products like high-quality float glass, coated, toughened, laminated, fire protection and specialist glass, as well as energy saving Insulating Glass Units were developed by combining our unrivalled technical expertise with true innovation.

Today we manufacture our products in around 30 countries, and we supply these to the building trade, the automotive industry and to the specialty glass sector across 130 different nations – just one of the reasons why the brand Pilkington has become synonymous with glass.

Only recently we became part of the NSG Group, which has added to our resources and our commitment to quality and excellence.

If there is anything we could do for you please let us know. We are in this business together, and we are stronger for it.



Pilkington **Optitherm™** S3



Pilkington **Optitherm™** S1

This publication provides only a general description of the products. Further, more detailed information may be obtained from your local Pilkington Building Products supplier. It is the responsibility of the user to ensure that the use of these products is appropriate for any particular application and that such use complies with all relevant legislation, standards, code of practice and other requirements. To the fullest extent permitted by applicable laws, Nippon Sheet Glass Co. Ltd. and its subsidiary companies disclaim all liability for any error in or omission from this publication and for all consequences of relying on it.



CE marking confirms that a product complies with its relevant harmonised European Norm.
The CE marking label for each product, including declared values, can be found at www.pilkington.com/CE



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