PILKINGTON

NSG GROUP

Pilkington Solar Control Range

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Durham University Business School – Durham.

Land Rover Bar Americas Cup
Headquarters – Portsmouth.

Energy efficiency in buildings

Today's increased use of glass in architecture and the ever growing focus on energy efficiency are driving developers, owners and occupants to demand higher performing products than ever before.

Buildings are increasingly becoming the focus of energy-saving initiatives because, not only are they a significant energy consuming sector, but the technologies and products to make buildings substantially more energy-efficient have already been developed. Developments in glass technology, such as low-emissivity (low-e) and solar control, have revolutionised the potential of glazing applications.

We are continually developing products to help specifiers achieve reduced carbon emissions.

In buildings that would traditionally be air-conditioned or use high levels of artificial lighting, installing solar control glass rejects unwanted solar radiation but allows valuable daylight to enter the building. Conversely, our energy saving low-e glass reduces heat loss from buildings and, in some cases, our products combine both low-emissivity and solar control performance.

Advanced products from the Pilkington range enable buildings to be both energy-efficient and yet be aesthetically attractive. Glass can be used as a positive contributor to low-energy performance, whilst creating interiors that are comfortable and façades which connect the occupant with the outside world. A good choice of glass helps to manage internal comfort by controlling direct radiation, glare, internal temperature and light levels as well as helping to reduce running costs.

Front cover image:
Kaisa-Talo – Finland.

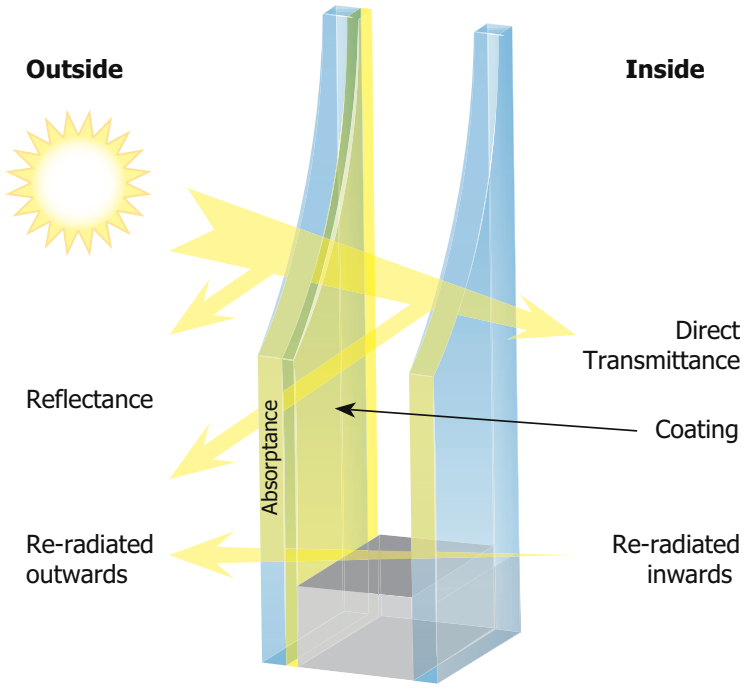
Solar Control

Solar control is a key issue in terms of energy saving. In hot conditions or for buildings with high internal heat generation, solar control glass is used to minimise solar heat gain by rejecting solar radiation and help control glare. In more temperate conditions it can be used to balance solar control with high levels of natural light.

The topic of air-conditioning remains a major concern to building designers and architects. Often, more energy is used to operate air-conditioning systems during the summer months than to heat the building in winter thereby increasing the carbon footprint. It is therefore essential to improve the energy efficiency of buildings during the summer as well as winter.

During the winter, low-e glass can help to reduce heat loss while allowing high levels of valuable free solar gain to enter buildings with no significant loss in natural light. However, unless combined with solar control, in the summer it can become uncomfortably hot.

How it works – Glass controls solar heat radiation from the sun by reflectance, transmittance and absorptance.



Insulating Glass Unit incorporating coated solar control glass.

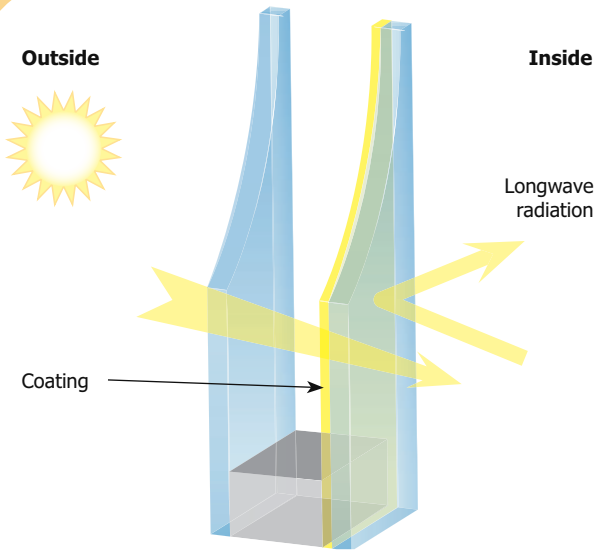
Kaisa-Talo – Finland

Thermal Insulation (low-emissivity)

Advances in low-e glass technology have made windows an essential contributor to energy conservation and comfort, minimising heat loss and internal condensation. The measure of heat loss is usually expressed in terms of U_g-value, which is the rate of heat loss in Watts per square metre per degree Kelvin temperature difference between inside and outside (expressed as W/m²K); the lower the U_g-value, the better the insulation of the product, for example, Pilkington **Optitherm**™ S1 Plus can achieve a U_g-value as low as 0.9 W/m²K.

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 is very effective at reflecting this long wave radiation back in to the room, therefore providing an effective barrier to heat loss. To maximise energy efficiency all year round, often the ideal glazing solution balances both solar control and low-e performance.

How it works – Effectively, low-e glass reflects energy/heat back into the building helping to reduce the amount of heat loss compared to ordinary float glass.



Insulating Glass Unit incorporating coated low-e glass.

Box Moor Trust
– Hemel Hempstead.

Cheltenham Racecourse – Cheltenham.
Image courtesy of Roberts Limbrick
Architects and Gary Britton Photography.

Pilkington **Suncool**™ Range

Comprises:
Pilkington **Suncool**™
Pilkington **Suncool Optilam**™
Pilkington **Suncool**™ Pro T

Pilkington **Suncool**™ is a range of off-line coated, superior solar control products with a wide variety of visible light transmittance, reduced solar transmittance and excellent low-e all in one superb product. The excellent solar control properties of Pilkington **Suncool**™ greatly reduce the need for air conditioning and artificial lighting within a building, whilst its insulation properties can reduce heat loss to 1.0 W/m²K in a standard Insulating Glass Unit (IGU) (6-16-6).

Pilkington **Suncool**™ offers the ideal choice for providing maximum light transmission and thermal comfort for occupants all year round.

Products in the Pilkington **Suncool**™ range are suitable for both commercial and high-end residential applications that demand high light transmission properties. They are designed to achieve optimum performance in large glazed areas and are available in a wide range of performances.

Pilkington **Suncool**™ must be incorporated in an IGU with the coating on the inside surface of the outer pane (surface #2).

Pilkington **Suncool**™ is available in annealed, toughened and laminated format and can be combined with many other Pilkington products, to achieve countless solutions in terms of functionality and cost-efficiency.

Full technical data is available in the Pilkington Solar Control Datasheet. For more information visit pilkington.co.uk/solarcontrol

The Pilkington **Suncool**™ range is available on both our standard Pilkington **Optifloat**™ Clear substrate and our Pilkington **Optiwhite**™. Pilkington **Optiwhite**™ is a true low-iron glass and is practically colourless. In addition to increased light transmission, it offers enhanced clarity with endless aesthetic possibilities. It is ideal for applications where glass edges are visible or where transparency and purity of colour are desired.

Pilkington **Suncool**™ Range – Technical Data

Product features summary

- Optimal visible light transmittance with excellent solar control and low-e performance all in one product
- Available in annealed, toughened and laminated format
- Available on both Pilkington **Optifloat**™ Clear and Pilkington **Optiwhite**™; a true low iron substrate
- Pilkington **Suncool**™ Pro T (toughenable version) is manufactured in the UK, improving lead times and enhancing flexibility
- Can be combined with other Pilkington products for additional benefits
- Available in 6 mm, 8 mm, 10 mm and 12 mm*
- Laminates available from 6.4 mm to 13.1 mm

* Upon special request

The Pilkington **Suncool**™ product range and appearance

Product	IGU construction (6 mm external pane – 16 mm – 6 mm Pilkington **Optifloat**™ Clear)		
	Appearance in reflection (External view)	Level of external reflection†	Appearance in transmission (Internal view)
Pilkington **Suncool**™ 70/40*	Neutral	Low	Neutral
Pilkington **Suncool**™ 70/35*	Neutral/Blue	Medium	Neutral
Pilkington **Suncool**™ 66/33*	Neutral	Medium	Neutral
Pilkington **Suncool**™ 50/25*	Neutral/Blue	Medium	Neutral
Pilkington **Suncool**™ 40/22**	Neutral/Blue	Medium	Neutral
Pilkington **Suncool**™ 30/16**	Neutral/Blue	High	Neutral

* Annealed & toughened version
** Toughened version only
† Level of reflection: low reflection is < 15%, medium reflection is 15-25%, high reflection is > 25%

The figures in a Pilkington Solar Control product name provide a guide to the performance, the Light Transmittance followed by the Total Solar Energy Transmittance (also known as g value or Solar Heat Gain Coefficient). For example, a typical double glazing unit with Pilkington **Suncool**™ 70/35 will have a Light Transmittance close to 70% and a Total Solar Energy Transmittance close to 35%.

First Direct Arena
– Leeds.

Pilkington **Suncool**™ One

Pilkington **Suncool**™ One 60/40 and Pilkington **Suncool**™ One 30/21 are off-line coated mid-range solar control products. They combine excellent low-e properties with medium solar control performance. They are very versatile, and can be used in both commercial and residential applications such as schools, building facades, bi-folding doors and other large glazed areas. They are single stock products, meaning they can be used in either annealed or toughened formats and offer the same performance and appearance both before and after toughening.

Product features summary

- Suitable for both commercial and residential applications, e.g. bi-fold doors, schools, glass facades
- Low internal reflection – improving the external view
- Neutral external appearance
- Must be incorporated into an IGU
- Available in 4 mm*, 6 mm, 8 mm, 10 mm** and 12 mm** substrate thickness

* Pilkington **Suncool**™ One 60/40 only
** Pilkington **Suncool**™ One 30/21 only.
12 mm available on special request

Product range and appearance

Product	IGU construction (6 mm external pane – 16 mm – 6 mm Pilkington **Optifloat**™ Clear)		
	Appearance in reflection (External view)	Level of external reflection†	Appearance in transmission (Internal view)
Pilkington **Suncool**™ One 60/40	Neutral	Medium	Neutral
Pilkington **Suncool**™ One 30/21	Neutral	High	Neutral

† Level of reflection: low reflection is < 15%, medium reflection is 15-25%, high reflection is > 25%

Stonehenge visitor centre – Salisbury. Image courtesy of Vitrine System Limited.

Pilkington **Optifloat**™ Tint

Pilkington **Optifloat**™ Tint is a range of low performance, body-tinted glasses which is manufactured using the standard float glass process. It is particularly suitable for applications that demand solar control without the use of surface coatings.

These products are available in a range of colours and thicknesses with solar control properties and colour densities that vary with thickness. Pilkington **Optifloat**™ Tint can be handled, processed and assembled into IGUs using standard techniques. For solar control and thermal performance, Pilkington **Optifloat**™ Tint can be combined with Pilkington low-e glass such as the Pilkington **Optitherm**™ Range in an IGU.

Multi-funtional combinations

Pilkington **Suncool**™ products are designed to be used as the outer pane of an IGU, with the coating on surface #2, and can be combined with many other Pilkington products for additional benefits.

Solar control with safety/security

Pilkington **Suncool Optilam**™ laminated glass is available in thicknesses of 6.4 mm to 13.1 mm to comply with safety and security requirements. When toughened, Pilkington **Suncool**™ T glass also offers impact and thermal stress resistance.

Solar control with noise control

Pilkington **Suncool Optiphon**™, our acoustic laminated version, combines both sound insulation and impact resistance in thicknesses from 6.8 mm to 13.1 mm.

Solar control with self-cleaning

Pilkington **Activ**™ is the world's first self-cleaning glass. Its unique dual-action coating uses the forces of nature to help keep the glass clear of organic dirt, giving you not only the practical benefit of less cleaning, but also clearer, better looking windows. It works in two ways: first it uses daylight to break down organic dirt (such as bird droppings) and then it uses rain to wash any loosened dirt away.

The Pilkington **Activ**™ Solar Control range comprises:
Pilkington **Activ**™ Blue,
Pilkington **Activ**™ Bronze,
Pilkington **Activ SunShade**™ Neutral,
Pilkington **Activ SunShade**™ Blue,
Pilkington **Activ Suncool**™*
These products combine the benefits of self-cleaning with varying degrees of solar control performance, offering the ultimate range of solar control solutions.

* Not available with toughened format.

For further information on our product range visit **pilkington.co.uk**

Images for illustration purposes only.

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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