



PILKINGTON BUILDING PRODUCTS – UK: INNOVATORS IN GLASS

One of the world's largest manufacturers of glass and glazing products, Pilkington was founded in 1826 in St Helens, near Liverpool, as a small window glass business. Richard and William Pilkington had no previous experience in the craft of glass making, but within 50 years, the Pilkington brothers emerged as Britain's leading manufacturer of flat glass. However, it was after the Second World War that the company really flourished in terms of growth and innovation. In 1952, the company announced a revolutionary new method of making flat glass – the float process, the most significant invention in the history of glass making, propelling Pilkington to a business of significant importance on an international level.

The company remained in family ownership until 1970 when shares were issued on the London Stock Exchange. During the last 25 years the business has flourished in Europe, the United States, South America and Australasia. Today over 80 per cent of the Group's sales are outside the United Kingdom and in conjunction with its associates, the Group has the widest geographical reach of any glassmaker.

In June 2006 Pilkington plc was acquired by NSG UK Enterprises Limited (NSG Group). On April 1 2007, all of the Building Products and Automotive businesses of the NSG Group and Pilkington were combined into an integrated 'Flat Glass' business. The other major structural difference is that in June 2007, the NSG Group sold the Pilkington Australasia Flat Glass business to CSR of Australia. Consequently the NSG Group's Flat Glass business, trading under the 'Pilkington' name now comprises the Building Products businesses in Europe, Japan, North America, South America and South East Asia, which are managed on a regional business, and the Pilkington Automotive business which is managed on a global basis.

Glass produced by Pilkington Building Products - UK is used across the breadth of the building and construction sectors and has a wide variety of applications. It also has a real relevance within a consumer context as well. The company's glass improves energy usage, protects against fire, insulates against noise, reduces sun glare, provides safety and security, affords decoration and privacy, heightens aesthetic appeal and self-cleans.

The depth of expertise within Pilkington Building Products - UK means that the company can speak authoritatively to people from across the entire building and specification chain, whether it is architects and specifiers, installers, door manufacturers, builders, local authorities, housing associations, public sector bodies, building owners, building occupiers, facilities managers, fire prevention officers, interior decorators, fabricators, housebuilders, glass merchants, end users and consumers

Evidence of Pilkington technology is all around and yet it is often unnoticed because of the perfection of transparency it brings to glass products. Most of the glass in the world's homes, offices, hotels, public and industrial buildings is float glass. The process pioneered by Pilkington and adopted around the globe as the universal method for making high quality flat glass.

The expertise of Pilkington Building Products – UK in glass compositions and coatings is commonly applied to the manufacture of products that keeps heat in and out of buildings, reduces noise nuisance, protects, secures and self-cleans. Pilkington has a long and illustrious record for innovation and over the years the company has consistently invested in research and development to further refine its core technology. It sees tremendous potential for improvement in product quality, process efficiency and is driven by customer demands for ever-increasing performance.

The float process has made it possible to provide the building industry with large glass plates, not just in flatness, but in freedom of design and from optical distortion.

Barriers to the sun

Intensive research over several decades has equipped the float process with more ingenious ways of controlling solar energy for greater comfort. Ingredients can be readily added to the melting process to control the wavelength and percentage of radiation transmitted or absorbed by the finished body-tinted product. Coatings are another method to modify the solar control properties. Pilkington has perfected the chemistry required to deposit coatings on-line, which is a more advanced method of solar control. The result is a reduction in solar heat transmission by reflecting rather than absorbing the radiation. These reflecting products have anti-glare properties in strong sunlight and transmit visible light.

Low emissivity coatings

In the late 1980s Pilkington achieved its biggest advance in float technology since that process was invented three decades earlier, when the company announced success with continuous on-line coating to make low emissivity glass such as Pilkington **K Glass™**.

The low emissivity glass carries a hard coating, which has the unusual property of transmitting visible light while rejecting heat waves at room temperature. The low-E coating is normally used on the cavity-facing surface of the inner pane of a double-glazing unit. Its job is to significantly reduce radiative heat loss into the cavity and then to the outside air. Low emissivity glass is now an integral building material and Pilkington **K Glass™** continues to lead the field because it is easily stocked and processed and because its properties, including the solar gain, enable it to achieve an exceptional Window Energy Rating.

Our new energy efficient glazing, Pilkington **energiKare™** is made up of Pilkington **K Glass™** and Pilkington **Optiwhite™**, a special 'extra clear' glass which allows more solar heat in through the windows, making a home feel warmer without the need to turn up the heating. Windows incorporating Pilkington **energiKare™** have a WER of C or above and can apply for the Energy Saving Trust Energy Saving Recommended Scheme.

Cleaning up

An important technological breakthrough was introduced to the UK in 2002, in the form of the world's first self-cleaning glass, Pilkington **Activ**TM, considered by many to be an impossible dream. Pilkington **Activ**TM is effectively the same as conventional glass, but with a specially developed coating on the outside, that once exposed to daylight, reacts in two ways. Firstly, it breaks down any 'organic' dirt deposits through a 'photocatalytic' process, and secondly, when it rains, instead of forming droplets, the water spreads evenly over the surface and takes the dirt off with it. It is kinder to the environment than ordinary glass and it is the ideal choice for situations where cleaning will be costly or difficult.

Engineering in glass

Pilkington has been attempting to eliminate frames to allow architects to visualise continuous weatherproof walls for over 30 years. In 1982 the company succeeded with the precision engineering of the Pilkington **Planar**TM system, which replaced patch fittings with stainless steel bolts passing through countersunk holes to secure glass panels up to 4.8 metres by 2.4 metres. Now the world's leading structural glass system, Pilkington **Planar**TM produces a highly attractive and contemporary structure, which is popular with architects.

Fire stoppers

Wire is the traditional way of enhancing the fire resistance of glass. Pilkington lay a wire mesh in between two plates of glass and the sandwich is then hot-rolled. The result was Pilkington **Pyroshield**TM. In the 1970s the company made a major breakthrough and developed clear wireless fire-resistant glass with Pilkington **Pyrostop**TM, which not only blocks the spread of fire, but also remains cool on the side away from the fire. The secret lies in the process of intumescence – the formation of a heat-opaque barrier that develops in-situ under the influence of heat. The presence of proprietary interlayers within the glass, when heated to 150°C, releases water to form a glassy silicate foam, opaque to both heat and light. Pilkington **Pyrostop**TM can provide fire resistance for as long as 180 minutes, affording both radiant and heat insulation and protection against hot gasses and flame penetration. Development continues to meet ever-tightening fire regulations.

KEY PRODUCTS

People think of glass as something that is simply looked through – but Pilkington Building Products - UK adds many more properties to glass than simple transparency. The company offers considerable expertise in the areas of energy management, fire protection, glass systems, noise control, safety, security, decoration, special applications and self-cleaning.

Pilkington Building Products - UK glass performs different roles for different functions. The company invests heavily into Research and Development resulting not only a range of glass types to suit today's needs but also the processes to enable the provision of high quality products to meet the changing demands of the end user. The versatility and sheer variety of the company's products go a long way to explain why the company retains its position as the market leader.

Below is a handy guide to the company's products, which has been categorised into distinct benefit-led sections:



THERMAL INSULATION

Glass that provides a comfortable environment by keeping buildings warm in the winter preventing heat escaping from buildings (thermal insulation). Pilkington Building Products - UK has developed a comprehensive range of products, offered in stock, toughened, laminated or insulated glass unit form enabling designers to control the energy to suit the users and choose from a wide variety of aesthetic options. Products include:

Pilkington **energiKare**TM is made up of Pilkington **K Glass**TM, the UK's best selling low emissivity glass and Pilkington **Optiwhite**TM, a special 'extra clear' glass which allows more solar heat in through the windows, making a home feel warmer without the need to turn up the heating.

Different to standard double glazing as it works in two ways. It reduces the amount of heat lost through windows by up to 90 percent and it also allows more heat (energy) from the sun in through the window. This effect is known as solar gain and as it comes from the sun it is free of charge, its effects being felt all year round.

Pilkington **K Glass**[™]: Forming the inner pane of an insulating glass unit (IGU), it allows less heat to escape through windows than ordinary glass thanks to a special energy coating, which allows the sun's rays through but reflects internal heat back into the home. Pilkington **K Glass**[™] is the market leading, easy solution to meeting the requirements of Part L of the Building Regulations.

Pilkington **Optitherm**[™] range: A high quality clear glass with a specially formulated off-line low emissivity coating, which is applied to the surface after glass manufacture. Once incorporated into an IGU, the effect is to reflect energy generated internally back into the building. It is ideal for applications where a much higher level of thermal control is required.

Pilkington **Insulight**[™]: Pilkington's own Insulating Glass Unit (IGU) provides a high quality product in a wide range of formats to offer the benefits required by the market. Offering effective thermal insulation, solar control, decorative effects, colours, safety, security, self-cleaning or noise control. Enhancements are constantly being developed and introduced as needs evolve. Pilkington's involvement in the market at this level gives the company a strong insight into the needs of customers and enables it to lead the way in introducing new standards.



SELF-CLEANING

Pilkington Building Products - UK has developed a revolutionary dual action coating self-cleaning glass, called Pilkington **Activ**[™]. The coating on Pilkington **Activ**[™] uses the UV in daylight to break down and loosen dirt and it makes rainwater sheet off the glass, thereby washing loosened dirt away when it rains. It provides the practical benefit of less cleaning and clearer, better-looking windows. It can also be combined with other glass products from the Pilkington range to offer many additional benefits

TEN FACTS ABOUT GLASS

1. Glass made its first appearance in Mesopotamia, nearly 5000 years ago, in the form of pearls and jewels. The Egyptians also used it, from around 1500 BC. But it was the Romans who made the first glass windows, of a composition very close to that of present-day glass.
2. Most pre-Roman glassware was fashioned by the core technique, created using a mixture of clay and dung.
3. The original eyeglass first made an appearance in Northern Italy in 1269, although the true identity of who first invented spectacles will probably never be known.
4. Glass never wears out - it can be recycled forever. The energy saved from recycling one glass bottle can run a 100-watt light bulb for four hours.
5. Sir Alastair Pilkington had the idea of the "float" method of glass production while washing up. The sight of the washing up liquid floating on the water, it is said, made him that the same principle could be applied to the manufacture of glass. It took seven years of hard work for Sir Alastair and his small team to develop the float process.
6. More than one in four light vehicles made in the world use Pilkington glass in the manufacture.
7. Glass can help heal, repair and build bone and tissue. It is also used in the purification of DNA.
8. The stainless steel and glass structure, the Petronas Twin Towers in Kuala Lumpur, Malaysia, is the world's tallest office building measuring 452metres tall, contains 32,000 windows.
9. If every single glazed window in the UK was replaced with low emissivity double glazed units, the national CO2 savings would be nine million tonnes annually.

10. More than 800,000 insulated glass units are made in the UK every week by an industry that is still highly fragmented.