

Pilkington **Activ**[™]: QUESTIONS AND ANSWERS

1. Application

Is it true that Pilkington **Activ**[™] is only for use in domestic situations?

No. Pilkington **Activ**[™] offers benefits for domestic, light commercial, public sector and high-specification commercial applications. It is particularly beneficial in areas which are difficult to access for cleaning such as upper floor windows, conservatory roofs, other sloping roofs, atria and any building where the occupants find it difficult to clean their windows safely.

Can Pilkington **Activ**[™] be used in shop windows?

Yes, however it should be noted that Pilkington **Activ**[™] needs both daylight and rainfall to work effectively. Shops are often situated in covered walkways or arcades where large projecting canopies may prevent sufficient daylight and rain reaching the glass.

Is it OK to use Pilkington **Activ**[™] to achieve other performance benefits?

Yes. Pilkington **Activ**[™] coating must be glazed on surface 1, the external surface of an IGU. Once incorporated into an insulating glass unit, Pilkington **Activ**[™] can be used in combination with an extensive range of products offered by NSG Group to achieve the required benefits. For thermal insulation, Pilkington **Activ**[™] can be incorporated into IGUs with Pilkington **K Glass**[™] or Pilkington **Optitherm**[™]. If it is necessary to have another glass as the inner pane, then the dual coated Pilkington **Activ Optitherm**[™] can be used. For solar control, Pilkington **Activ**[™] Blue can be used. This is a light blue tinted glass with Pilkington **Activ**[™] on one surface. The Pilkington **Activ Suncool**[™] products are also available. These are dual coated products with Pilkington **Suncool**[™] coating on the reverse side to Pilkington **Activ**[™] coating. Pilkington **Activ Optilam**[™] Brown, a solar control laminate can also be used. Pilkington **Activ**[™] can be toughened or laminated for safety or security applications. For noise control, Pilkington **Activ**[™] can be combined with Pilkington **Optiphon**[™]. Pilkington **Activ**[™] can be laminated to Pilkington **Stippolyte**[™] for decoration. Finally, Pilkington **Activ**[™] can be combined with Pilkington's fire products such as Pilkington **Pyrostop**[®] or Pilkington **Pyrodur**[®].

Is Pilkington **Activ**[™] suitable for internal use?

No. Pilkington **Activ**[™] needs daylight and rain in order to work properly so it may only be used externally.

Can Pilkington **Activ**[™] be used with frame-less glazing?

Pilkington **Activ**[™] can be installed in a frameless glazing system such as Pilkington **Planar**[™]. It requires the use of specialist sealants that don't leach silicone. Information on these products are listed on the Technical Update that is available on www.pilkington.com or by calling +44 1744 692000. It is also possible to butt joint panes of Pilkington **Activ**[™] using the specialist sealants. It is not currently possible to install Pilkington **Activ**[™] in a structurally bonded or "stuck back" type system.

Is it acceptable to use Pilkington **Activ**[™] in Single Glazing?

Yes, providing that the system meets the requirements of the relevant Building Regulations. Pilkington **Activ**[™] can be provided in annealed, toughened and laminate forms.

2. Processing

Can I buy or make Insulating Glass Units (IGUs):

- with Internal Georgian Bars?

Yes. However, where it is the intention of the customer not to replace all glazing with Pilkington **Activ**[™] the customer should be advised that the visual properties of Pilkington **Activ**[™] are different to clear glass. Therefore internal Georgian bars may look slightly different from those with clear glass.

- with Applied Bevels?

Yes, but the adhesive used to apply the bevels to the glass must be one that has passed Pilkington's compatibility tests. These products are listed on the Technical Update that is available on www.pilkington.com or by calling +44 1744 692000.

- for Timber framing systems?

Yes but only with sealants or glazing tapes, which have passed Pilkington's compatibility tests. These products are listed on the Technical Update that is available on www.pilkington.com or by calling +44 1744 692000.

Note: NSG Group test regimes only confirm product compatibility with Pilkington **Activ**[™]. Sealant suppliers are responsible for testing the life span and/or recommending the suitability for purpose of the glazing.

- with Applied Leads?

Yes, but the make of leading used, and the adhesive used to apply it to the glass must have passed Pilkington's compatibility tests. These products are listed on the Technical Update that is available on www.pilkington.com or by calling +44 1744 692000. The customer should be made aware that applying leading, in effect breaks up the window into many small windows and this will change the water sheeting effect.

- with Duplex, Cottage or Applied Georgian Bars?

Yes, but the tapes used to adhere the bars to the glass must have passed Pilkington's compatibility tests. These products are listed on the Technical Update that is available on www.pilkington.com or by calling +44 1744 692000. These decorative bars, once installed, may act as a dam causing a build-up of residual dirt along the edges of the applied bars.

Can I sandblast the Pilkington **Activ™** coating?

No. Any processing of this nature to the coated surface will result in the loss of self-cleaning characteristics permanently wherever the coating is damaged or removed.

Can we safety mark toughened Pilkington **Activ™** on the coated surface?

NSG Group recommend that wherever possible, the application of any safety mark should be to the non-coated surface. Where this is not practical however, the coated surface may be marked but great care is necessary.

Does the toughening process affect the colouring of Pilkington **Activ™**?

Only in cases of excessive temperatures.

Can a Pilkington **Activ™** IGU be manufactured with a silicone seal?

Yes with care, so that there is no silicone contamination on the glass surface. A silicone sealed unit is normally glazed to ensure that moisture could not reach the seal and eventually drain onto the glass.

How do you cover the sealant from UV attack in a stepped unit?

We normally apply lead strip on the outer leaf.

So what do you do with Pilkington **Activ™**?

We would still recommend covering the step with a lead strip. The lead should be treated with Leadshield™ or Patination oil to reduce potential of carbonate run off. In this type of application, run off is generally not an issue as the stepped edge is normally at the bottom of the glazing.

Conservatories, however, pose a greater potential risk of run off, carrying lead carbonate from flashing onto the glass roof below. This can lead to marking of any glass type, not just Pilkington **Activ™**.

3. Technical

What is the current situation regarding compatibility with dry gasket glazing systems?

All glazing systems where the gasket is lubricated with silicone oil are incompatible with Pilkington **Activ™**. Leaching from these product types onto the glass coating will create a hydrophobic area around the edge of the glass known as "picture framing", which is unacceptable to customers. The same is true of many silicone based rubber gaskets. However, there are many gaskets that are compatible with Pilkington **Activ™**, e.g. gaskets that are part of a co-extruded system, a dry gasket used without lubricant, or a gasket using an alternative lubricant such as

glycerine oil. These products are listed on the Technical Update that is available on www.pilkington.com or by calling +44 1744 692000.

Are EPDM gaskets silicone-free?

Some are. A list of gaskets that have passed Pilkington's compatibility tests can be found on the Technical Update that is available on www.pilkington.com or by calling +44 1744 692000.

Does Pilkington **Activ**[™] clean off finger prints?

Pilkington **Activ**[™] will clean off finger prints but it may take a period of time, dependent upon environmental conditions. It may take as long as several weeks. NSG Group suggest customers avoid touching the glass wherever possible, as fingerprints may act as a key for inorganic dirt to stick to and therefore appears worse. NSG Group also recommend that installers wear gloves for avoidance of fingerprints and traces of contaminants from other glazing compounds, silicone in particular, which may be more difficult to remove.

Is it true that more dust and dirt sticks to Pilkington **Activ**[™] than to normal float glass in dry weather?

In dry weather, Pilkington **Activ**[™] destroys organic dirt, but inorganic dirt is not washed off. However, there is no difference in the amount of dirt or dust that sticks to Pilkington **Activ**[™] compared to normal glass. This has been shown in laboratory tests and real life tests in the dusty Arizona Desert.

What effect do PVC cleaners have on the coating?

Several brands have been tested. If and when used, the agent needs to be rinsed off the glass with warm soapy water, which should ensure that the coating remains unharmed. There is a list of suitable cleaners on the Technical Update that is available on www.pilkington.com or by calling +44 1744 692000.

Is Pilkington **Activ**[™] nanotechnology?

Pilkington **Activ**[™] has been cited as an example of nanotechnology. Whilst the coating is nanometres thick it is really a development of thin film technology, rather than being a specific Nanotechnology product. The name nanotechnology is usually applied to the scientific investigation or application of particles and/or structures, which have sizes of less than one hundred nanometres. Particles or structures of this size can have unique properties compared to bulk materials. Pilkington **Activ**[™] is based on a thin film of titanium dioxide rather than particles of titanium dioxide and the film is approximately 15 nanometres thick. Whilst falling under the broad definition of nanotechnology we feel it is best referred to as a development of thin film technology. The coating is applied by a process called chemical vapour deposition which involves the pyrolytic addition of chemicals on a hot glass substrate to form a thin film. This process is conducted as the glass is manufactured.

Does silicone permanently damage the coating?

No it just blocks the effectiveness of Pilkington **Activ™**. Small amounts can eventually be broken down by Pilkington **Activ™** but large amounts may need a special chemical silicone remover.

Will my Pilkington **Activ™** glass ever get dirty?

When there are long dry spells there will not be any rainwater to wash off loosened organic dirt and organic particles. Light use of a hosepipe can simulate rain and clean the glass.

Is Pilkington **Activ™** suitable for coastal areas?

Salt deposits from salt spray are inorganic. Rain normally removes this but if there is a long dry spell then you may have to resort to using a hose pipe to simulate rain.

Why is there a limit for the slope of roofs and Pilkington **Activ™**?

Pilkington **Activ™** needs both daylight and rain to work effectively. When the roof angle gets too low the rain does not wash the loosened dirt off as effectively. A good flow of water across the glass is beneficial. Pilkington **Activ™** still gives better results than ordinary glass with low angle roof applications.

Does Pilkington **Activ™** use bacteria to break down the deposits?

No. On the contrary the process is photocatalytic and is anti-bacterial. This prevents fungi and mould growth that might start to build on ordinary glass.

4. Quality

Will each Pilkington **Activ™** unit arrive wrapped or protected in some way other than the normal protection pads?

This depends on the decision of the IGU supplier. Pilkington **Insulight Activ™** units will generally not be supplied with any special protection, other than standard protective pads. Care should also be taken when choosing protective film especially where the film may be adhered to the unit for long periods of time. A list of suitable protective films can be found on the Technical Update that is available on www.pilkington.com or by calling +44 1744 692000. However, correct handling, transportation, storage and installation of Pilkington **Activ™** units should mean that the product does not require protective film.

Will Pilkington **Insulight Activ™** units be supplied with edge tape?

No.

Will we be permanently marking Pilkington **Activ™**?

No, every Pilkington **Activ™** unit will be labelled on surface 4 with a Pilkington **Activ™** instruction label for Installer and Consumer. The installer should leave these labels intact whilst installing and beyond as proof to the customer that they the product contains Pilkington **Activ™**. Consumers

should always be left with a copy of the cleaning and maintenance guidelines, which are included in the back of the Consumer brochure.

I am concerned about cleaning off sealant deposits.

Sealant deposits should be removed before they dry using a suitable solvent according to procedures outlined in the Handling and Processing Guidelines. Residual deposits of cured sealant will be more difficult to remove and abrasive materials must not be used to aid cleaning.

Does the unit come with the Logo on or does the Installer have to apply it?

All Pilkington **Activ™** units should have the logo label with Installer and Consumer instructions applied by the IGU manufacturer.

What is the life-span of Pilkington **Activ™**?

The Pilkington **Activ™** coating will last as long as the glass.

Were real life tests carried out on Pilkington **Activ™** before it was released?

Yes, glass was installed and monitored at various locations round the world. These were chosen to test the glass under a variety of weather conditions. The glass was tested for six months in the Arizona Desert, six months in Florida, twelve months in Ohio in the USA, twelve months in Gelsenkirchen in Germany and thirty months outside our Technology Centre in the north west of England.

What were the results of the real life test?

The longest real life test was in the north west of England and lasted thirty months. During that time, measurements of how dirty the glass looked were taken every two weeks. During the thirty months, there was only one occasion when the Pilkington **Activ™** looked dirtier than the normal glass.

Is there a British or European Quality Standard for self-cleaning glass?

As self-cleaning glass is such a new product, there is not yet a quality standard to measure it against. NSG Group is working with other glass manufacturers, Standards Institutes and universities to formulate recommendations for such a standard. At present, Pilkington **Activ™** is tested against EN 1096 Part 2 but this concerns the durability of the coating not how good it is at self-cleaning.

How do I know Pilkington **Activ™** has been supplied?

The glass may carry a label on one of the surfaces stating that there is a Pilkington **Activ™** coating and specialists may carry a Pilkington **Activ™** coating detector. A simple test is to spray water at the surface and compare it with ordinary glass, see it sheet off the glass rather than form lots of rivulets. Silicone contaminated surfaces will also form rivulets similar to non Pilkington **Activ™** glass.

5. Marketing

What is NSG Group's marketing strategy for Pilkington **Activ**™?

On the Commercial Project side, we are increasing awareness of Pilkington **Activ**™ and Pilkington **Activ Suncool**™ among Architects, through advertisements, award sponsorship and competitions. At the same time, we are targeting Architects who have live projects that may be suitable for Pilkington **Activ**™. We are also targeting marketing effort at the social housing market, where there are considerable opportunities in three storey and above dwellings.

Are there still Pilkington **Activ**™ Partners?

No the Partner arrangement was a short-term arrangement for the launch period, which ended on 31st March 2003.

I have some literature, which refers to a hologram?

This was used during the launch period and has now been withdrawn.

How do I pronounce the brand name?

The product is pronounced as Active not Acteev.

Will IGU samples combined with Pilkington **K Glass**™ be available?

You should obtain any samples you require from your IGU supplier. It is recommended that samples are used for appearance purposes only. This is because Pilkington **Activ**™ needs 5-7 days exposure to UV light to charge the coating initially and regular exposure afterwards. This means that samples kept in salesmen's cars for example would not properly demonstrate the self-cleaning characteristics of the product.

Will there be any further marketing support from NSG Group?

Yes. There will continue to be strong ongoing PR and sales support for this product. The aim being to help in building consumer awareness of Pilkington **Activ**™ and provide you with the materials and other support you need to help you to sell successfully. You are encouraged to carry out your own marketing activity at a local or regional level to reinforce the message to consumers and achieve your own added value sales.

What is the average cost of cleaning a commercial building?

Pilkington United Kingdom did a survey to answer this question and concluded that there is no typical case. Most architects we spoke to agreed that there are too many variables, such as size of building, amount of glazing, accessibility, and the attitude of the owner, to quote an average. However, low rise buildings, those of four stories and under, tend to cost £2000 per annum. Medium rise buildings of five to eight stories tend to cost £5000 per annum. And for taller buildings, the bill can be up to £50000 per annum, depending on how tall they are. These do not include the cost of the capital cleaning equipment installed when the building is built.

6. Product Improvements

When will 8 mm and 10 mm Pilkington **Activ™** be available?

Both are available from stock.

Are there any plans to apply the coating to products other than Pilkington **Optifloat™** Clear?

Pilkington **Activ™** is only available coated directly onto clear glass. It has also been available since September 2005 coated onto a light blue tinted glass. We call this product Pilkington **Activ™** Blue. It is available in 4mm, 6mm and 10mm thicknesses. It handles and processes in the same way as Pilkington **Activ™**. However it has the benefit of good solar control capabilities and is ideal for conservatory and Atria roofs.

Do you have any plans to produce Pilkington **Activ™** in colours other than blue?

At present no; if other colours are required it is possible to laminate Pilkington **Activ™** with a variety of tinted interlayers i.e. Pilkington **Activ Optilam™** I Brown (Grey, Green and Translucent White are also possible given sufficient demand) or to laminate a tinted glass to Pilkington **Activ™**.

If you have any further questions, please contact your NSG Group representative or the Helpline on +44 1744 692000.