



Section 1 - Handling and Processing

Product Description

Pilkington **AviSafe™** is a product designed to reduce bird collisions with glass. It has a patterned ultraviolet (UV) enhanced coating that disrupts the reflection on the glass, so the bird can see a barrier.

The pattern of the UV enhanced coating is stripes which have a pitch of approximately 100 mm. The width of the lines is not precise because the lines have 'soft' edges as the thickness of the coating decreases gradually. They are approximately 25 mm wide, depending on your eyesight and lighting.

Pilkington **AviSafe™** can be single glazed or incorporated into an insulating glass unit (IGU) with the coating always positioned on surface #1, the external face of the outer pane. This enables the product to be as effective as possible at disrupting the reflection so the bird can only see a barrier. The product should be installed so that the stripes are vertical for maximum effectiveness at reducing bird collisions.

Pilkington **AviSafe™** is a durable coating meeting the requirements of European Standard EN 1096 Class A 'Glass in building – Coated glass'. When toughened Pilkington **AviSafe™** will comply with EN 12150 'Thermally toughened soda lime silicate safety glass'.

Pilkington **AviSafe™** is a single stock product, it can be used annealed or toughened maintaining the same performance.

As coatings can be damaged if not handled correctly, it is important that handling and processing is carried out in accordance with good practice, as described throughout these guidelines.

Product Range

Pilkington **AviSafe™** is available in sizes up to 6000 mm × 3210 mm in Europe and up to 5100 mm × 3210 mm outside of Europe. It is available in 4-10 mm thickness. 12 mm available on special request.

All the plates will have the Pilkington **AviSafe™** stripes running perpendicular to the 3210 mm edge. In a façade the stripes should be orientated in the vertical direction, this means that

the maximum width of an individual window or IGU is 3210 mm. The maximum height is dependent on the plate available; for LES plates this is either 2250 mm or 2550 mm, for US Jumbos this is 5100 mm, and for UK Jumbos this is 6000 mm.

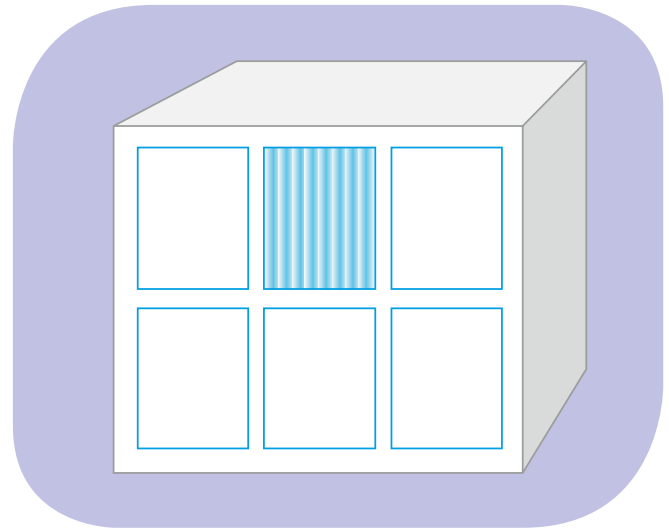


Diagram 1 – showing façade with stripes in the vertical direction.

Delivery and Storage

There are several measures that we have put in place to protect Pilkington **AviSafe™** during delivery and storage. They are as follows:

- The glass and coated surfaces of stock sheet products are protected with an interleaving material. This helps to prevent moisture staining and abrasions between the individual sheets.
- For additional protection during handling, cover the coated surface with standard plastic wrap. This can be removed immediately after installation to avoid thermal risk.
- To ensure adequate protection of the coated surface a range of transport pads have been tested and approved for cut sizes or assembled IGUs, they should be used during storage and transportation.
- Pilkington **AviSafe™** is generally delivered on stillages in pack quantities, exactly the same as clear glass of similar thickness and size.
- Pilkington **AviSafe™** is always delivered with coated surface to the inside of the pack. Please note that the innermost glass of each pack will be a cover plate, usually 6 mm Pilkington **Optifloat™** Clear.

- When offloading and storing, care should be taken to avoid damage to the coated surface, as well as the edges.
- The glass should be stored in dry conditions, stacked upright and fully supported following normal good practices.
- Whilst Pilkington **AviSafe™** does not have a specific maximum shelf life, provided adequate storage conditions are met, it is good practice to process the glass within six months from the date of delivery.
- Packs should be stored where the relative humidity does not exceed 70% and the ambient temperature does not fall below 15°C. Significant temperature fluctuations during storage that may lead to condensation should be avoided. Delivered packs should be allowed to acclimatise before opening, to help avoid condensation and potential damage to the coating.

For more information, please consult NSG Group.

Handling

Suction cups can be used on the coated surface. However, they should be clean, dry, and must not slide on the surface.

Suitable clean dipped gloves should be used.

The coated surface must not be marked with adhesive labels or wax crayons as subsequent removal may be difficult. If the glass requires some form of identification it should be placed on the non-coated surface.

Identifying the coated surface

The Pilkington **AviSafe™** coating is always positioned on surface #1, the external face of the outer pane. The relatively high reflection of the stripe can be used to identify the coated surface during processing. If a pencil or similar object is placed adjacent to the coated stripe a reflected image will be seen. If there is no gap between the object and reflected image, that is the coated surface. If there is a gap, as shown in the diagram below, that indicates that the glass side is uppermost.

Edge Deletion

The Pilkington **AviSafe™** coating is always on surface #1 and does not require edge deletion.

Cutting

To prevent coating damage from glass particles, we recommend that Pilkington **AviSafe™** is cut with the coated surface facing up. Care must be taken if straight edges, metal tape measures, cutting bars or cutting sticks are used on this surface.

Wear gloves and aprons to protect the coated surface from contact with belt buckles or metal studs. Care should be taken with watch straps and other jewellery.

Gloves should be clean and checked to ensure that they do not leave prints on the coated surface.

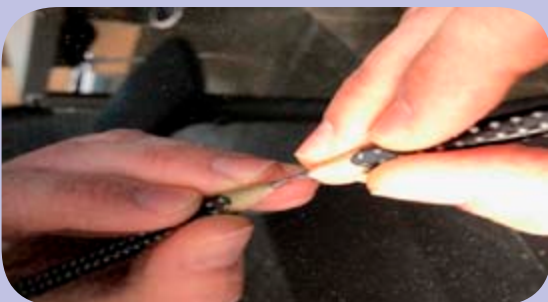
When cutting the glass automatically, cutting wheel pressure and break-out settings will be very similar to those used for float glass. If needed, fast dispersive lubricant should be used. No change in wheel type is required, however wheel life may be shortened, even with hand cutting.

The glass should be processed with the coated surface face up. Therefore, special attention should be paid to any parts of the process which involve contact with the upper surface to ensure that they do not mark the coating.

Hand scoring of the glass on the coated side may feel different to that of float glass.

Stripe alignment on a building

The vertical stripes on different IGUs do not need to line up on a building to be effective at reducing bird collisions. However, it is anticipated that building owners will expect the stripes to align. The following section provides guidance on considerations and approaches to do this. The precise pitch of the lines is 100.5 mm.



Pencil next to coated surface.
No gap between object and reflected image.



Pencil next to glass surface.
Gap between object and reflected image.

Diagram 2 – showing a technique to identify the coated surface.

Building considerations for stripe alignment include:

- Consider stripe alignment on each façade and installation individually
- The stripes must be vertical with respect to the IGU dimensions
- IGU dimensions and which IGUs are above each other on the facade
- Allowance for the frame, or seal between glazing
- If there are windows that open, above a fixed IGU

Process considerations for stripe alignment include:

- Cutting table datum and known offsets
- Accuracy of the cut relative to the datum position
- Square up of glass on the cutting table
- Allowance for reduced dimensions due to edge grinding
- Rotation of a cut plate in processing has the potential to increase alignment error. It is preferable to maintain orientation from prime plate to IGU installation

Approach 1 – centre line

One approach to obtain stripe alignment is to ensure that there is a coating stripe in the centre of each IGU. This approach is effective for a regular façade where IGUs above and below each other share the same centre line. The symmetry negates the impact of 180-degree IGU rotation. It can also account for reduced IGU dimensions due to window openings.

If the cutting pattern and plate dimensions allow, plates above each other on the building can be cut above each other on the prime plate.

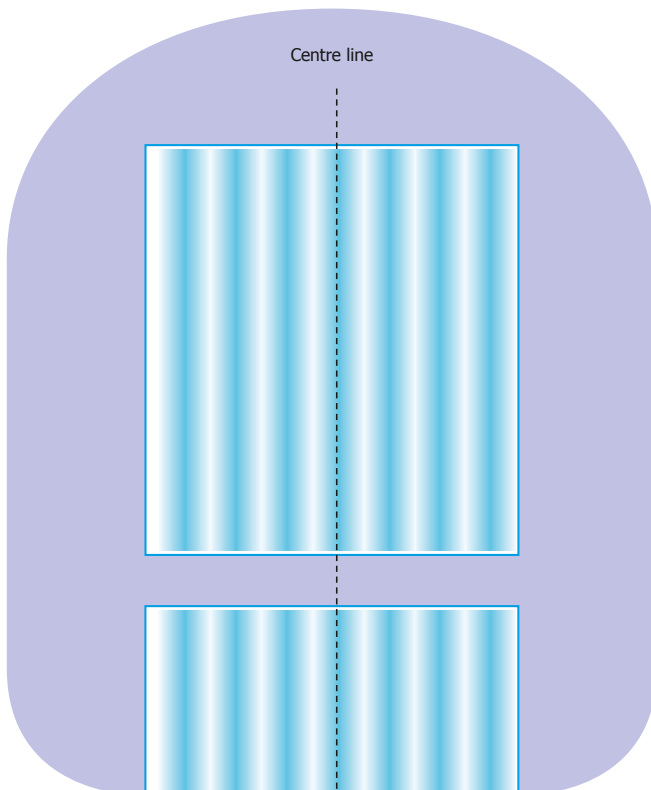


Diagram 3 – showing approach 1 – centre line. Ensure that there is a coating stripe in the centre of each IGU.

Approach 2 – using Computer Aided Design (CAD)

A second approach is to locate the position of the first coating stripe relative to the edge of the prime plate on a CAD drawing. The 100.5 mm pitch of the stripe can then be used for the remaining coating stripes on the plate. A CAD plan of the façade can then be overlaid, and the precise cutting pattern determined.

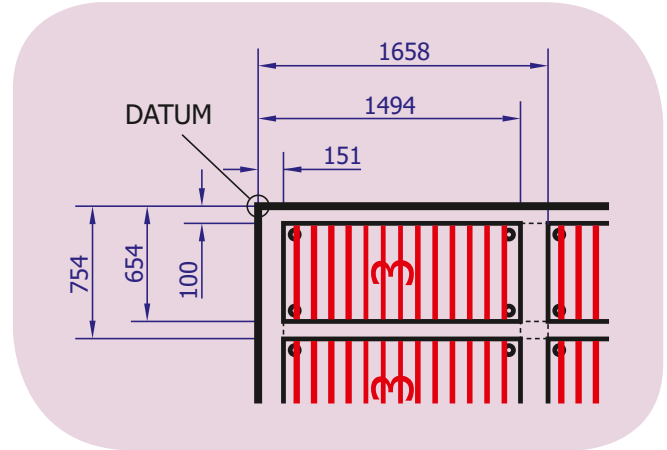


Diagram 4 – showing approach 2 – using Computer Aided Design (CAD). Please note that this is an example only and that the position of the coating stripe relative to the datum should not be inferred from this diagram.

Washing

Pilkington **AviSafe™** is a durable coating tested to EN 1096 Class A. As with any coated glass product, care should be taken while washing to prevent damage. It is essential to ensure that no metal, e.g. cleaning equipment, comes into contact with the coated surface.

Machine Washing

There should be no difficulty in machine washing Pilkington **AviSafe™** using the washer manufacturer's recommended set-up instructions for a given glass thickness.

Ensure adequate water flow through all nozzles, use the recommended water temperatures, make sure the brushes are in good condition and are set at the correct height and not rotating when the glass is stationary and ensure air knives and filters are clean.

For best results, the Pilkington **AviSafe™** surface should be transported through the washer with the coating away from the glass support rollers. This will minimise any contact with the coating that could necessitate further spot cleaning.

Where possible use the washing machine manufacturer's recommended glass cleaning detergent. Final rinsing should be with clean de-ionized water (conductivity: less than 30 µmS/cm) heated to at least 40 °C.

Under no circumstances should abrasive cleaners, hydrofluoric acid, fluorine compounds or strong alkalis be used on the coated surface.

Washing/Spot Cleaning

Pilkington **AviSafe™** can be cleaned and maintained by hand. A mild, non-abrasive detergent (i.e. one that does not contain solids in suspension) and water solution is recommended.

Abrasive cleaners must not be used.

To wash the coating, apply the solution to the glass with a clean, soft cloth, sponge or pad and rinse thoroughly with clean water. Dry the glass by wiping with a soft, lint-free cloth. Take care to ensure that no abrasive particles are trapped between the glass and the drying device otherwise coating damage may occur.

Dilute ammonia or alcohol based window cleaners may be used for spot cleaning. Steel wool or razor blades must not be used on the Pilkington **AviSafe™** surface.

Laminating

Pilkington **AviSafe™** is suitable for lamination by either PVB autoclave or cast-in-place processes. To preserve its bird safe property, it should be laminated with the coating outward, away from the interlayer.

Laminating processes should not normally damage the Pilkington **AviSafe™** coating. Avoid excess interlayer material adhering to the coated surface as this may be difficult to remove completely.

Toughening

Once cut to size, Pilkington **AviSafe™** can be heat strengthened or fully toughened like float glass. The coating should be washed and dried before carrying out either of these processes.

The coated surface must be visibly clean before entering the heat treatment furnace and should be face up in the furnace to minimise the chance of coating damage. You may process the glass with the coating face down provided furnace rollers are clean and no skidding or sliding of the glass occurs as it is transported through the process.

The coating should not be put down onto castor rollers. The abrasive scrubbing action of pivoting castors will leave deposit marks that can be difficult to remove.

Do not overheat Pilkington **AviSafe™** during the heat strengthening or toughening process, as this can damage the coating. Overheating will normally be characterised by excessive distortion in the glass. To eliminate this problem a cooler glass temperature should be used during the process.

The heat strengthening and toughening parameters used for processing Pilkington **AviSafe™** are similar settings to those used for Pilkington **Optifloat™** Clear of equivalent thickness.

Insulating Glass Units

The uncoated float glass surface of Pilkington **AviSafe™** is compatible with a range of sealants including Hotmelt Butyls, Polysulphides, Polyurethanes and 2 Part Silicones.

In the event of sealant spillage onto the coated surface, a soft cloth soaked in methylated spirits or acetone should be used to remove the sealant while still wet (any health and safety requirements for using these chemicals should be followed). If sealant is allowed to dry the same method is recommended for its removal, but the task will be more difficult.

Under no circumstances should razor blades, steel wool or abrasives be used.

When assembling the unit, make sure there is no metal contact with the coated surface and once the IGU is complete, ensure the coated surface is protected from mechanical damage such as scratching.

Appearance

It is the responsibility of the processor to carefully inspect Pilkington **AviSafe™**, both before and after processing. (Glass not rejected by the processor during inspection and prior to processing will be considered acceptable by NSG Group). Glass should be inspected upon delivery. NSG Group will not accept rejection once glass has been processed.

Merchandising/Redistribution

When packing Pilkington **AviSafe™** for transport with the coating exposed, a fine even distribution of powder interleavant or a standard paper interleavant should be used.

When securing to pallets or transit frames, no strapping or other means of retention should come into direct contact with the coated surface.

Section 2 - Installation

Glazing

To differentiate each surface, all IGUs should be supplied with a label applied to the non-Pilkington **AviSafe™** side indicating which way around the IGU should be installed.

Repeat Orders, Colour Deviation

Production tolerances can cause slight colour deviations between different batches. These are minimal within a production run. Where glass will have to be supplied over a longer period for the same project, please indicate to the manufacturer so they can minimise colour deviations.

It is the installer's responsibility to ensure that the above recommendations are adhered to.

When Pilkington **AviSafe™** is glazed into a building, care must be taken during any further construction. Protect the coating from site contamination such as welding, rusty deposits, cement, plaster products or adhesives. Care should also be taken to ensure that alkaline leach-out from concrete, etc. does not occur.

After building work is complete the glass should be cleaned by rinsing with water to remove all traces of dust or abrasives which may have accumulated during construction. Then apply a cleaning solution (a mild detergent and water solution is recommended) onto the coated surface. Gently rub the wetted coated surface with a clean, lint-free towel or cloth and wipe nearly dry. Any moisture remaining on the surface will evaporate to leave a clean surface.

This publication provides only a general description of the products. Further, more detailed, information may be obtained from your local supplier of Pilkington products. 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, codes 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. Pilkington, "AviSafe" and "Optifloat" are trademarks owned by Nippon Sheet Glass Co. Ltd, or a subsidiary thereof.

The use of a squeegee on the coated surface is not recommended. If a squeegee is used then particular care must be taken to prevent dirt particles from becoming trapped under the blade and dragged across the coating and also to stop any metal parts from contacting the surface.

Glazing Locations

There are different causes of bird collisions with glass and it is important that Pilkington **AviSafe™** is used in applications where it will be effective. Birds collide into glass for three reasons:

- 1) Reflections of vegetation or landscape attract birds to collide with glass.
- 2) Green habitat inside buildings such as glass atriums, with clear glass can lead to collisions.
- 3) Glass corners or narrow passages can allow birds to see through to habitat on the other side of a building, encouraging them to try to fly through.

Pilkington **AviSafe™** is effective at reducing bird collisions due to 1) reflection. For 'fly through' applications 2) and 3) a frit-based solution may be more suitable.

Recycling

Pilkington **AviSafe™** can be recycled as float glass. Nevertheless, all country regulations should be followed for the disposal of the glass.



CE marking confirms that a product complies with its relevant harmonised European Norm.

The Declaration of Performance for each product, including declared values, can be found at www.pilkington.com/CE



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