



Pilkington **OptiView™** Ultra
Pilkington **OptiView™** Ultra Protect
Handling and Processing Guidelines

Pilkington **OptiView™** Ultra, Pilkington **OptiView™** Ultra DC,
Pilkington **OptiView™** Ultra Pro T, Pilkington **OptiView™** Ultra DC Pro T,
Pilkington **OptiView™** Ultra Therm, Pilkington **OptiView™** Ultra Therm Protect
and Pilkington **OptiView™** Ultra Protect

1. Product description

Pilkington **OptiView™** Ultra range consists of a sputtered off-line coated anti-reflective (AR) product on a Pilkington **Optiwhite™** low-iron substrate. Different versions of products are available such as monolithic, laminated, toughenable, either coated on one or both sides, including coatings with thermal insulation properties.

Pilkington **OptiView™** Ultra is a monolithic glass with an anti-reflective coating on one surface, which helps to reduce reflectance and allows more light to pass through, when compared to clear float glass with 8% light reflectance as standard. This product can also be coated on both sides and is available as Pilkington **OptiView™** Ultra DC.

Both Pilkington **OptiView™** Ultra and Pilkington **OptiView™** Ultra DC are available in toughenable versions known as Pilkington **OptiView™** Ultra Pro T and Pilkington **OptiView™** Ultra DC Pro T.

Pilkington **OptiView™** Ultra Protect is a laminated glass with anti-reflective coatings on surfaces #1 and #4 (both outer surfaces of the laminated glass), which helps to reduce the total visible light reflection to below 2%.

Pilkington **OptiView™** Ultra Therm is coated on both sides with an anti-reflective coating on one side and a thermally insulating coating on the other side.

The Pilkington **OptiView™** Ultra coating has been tested to EN1096 -2 achieving Class A.

The complete product range is shown in the table below:

Brand Name	Coatings	Process
Pilkington OptiView™ Ultra	Single side coating	Annealed only
Pilkington OptiView™ Ultra Pro T	Single side coating	Toughenable
Pilkington OptiView™ Ultra DC	Double-side coating	Annealed only
Pilkington OptiView™ Ultra DC Pro T	Double-side coating	Toughenable
Pilkington OptiView™ Ultra Protect	Double-side coating	Laminated
Pilkington OptiView™ Ultra Therm	Double-side coating	Annealed only
Pilkington OptiView™ Ultra Therm Protect	Double-side coating	Laminated

Note: Pilkington **OptiView™** Ultra Therm has an anti-reflective coating on one side of the glass and a thermally insulating coating on the other side.

2. Product Range

Pilkington **OptiView™** Ultra range is available in 3, 4, 6 and 8 mm (other thicknesses can be supplied on request).

Pilkington **OptiView™** Ultra Protect range is available in a range of thicknesses from 6.4 to 12.8 mm with other thicknesses up to 16.8 mm and even 17.5 mm made on request.

Pilkington **OptiView™** Ultra and Pilkington **OptiView™** Ultra Protect products are available in LES sizes, 3210 mm × 2250 mm and larger jumbo size, 3210 mm × 6000 mm. A 100 mm selvage should be allowed on the long edge of jumbo plates and the shorter edge of LES plates.

Pilkington **OptiView™** Ultra is available in a single sided anti-reflective coated product or as a double-sided coated product, Pilkington **OptiView™** Ultra DC. Both Pilkington **OptiView™** Ultra and Pilkington **OptiView™** Ultra DC are available in toughenable versions i.e. Pilkington **OptiView™** Ultra Pro T and Pilkington **OptiView™** Ultra DC Pro T.

3. Delivery and storage

Pilkington **OptiView™** Ultra and Pilkington **OptiView™** Ultra Pro T are normally arranged on stillages so that the uncoated surface of each sheet faces outwards. The orientation of the glass should be checked when unpacking. The last sheet in the pack is 4 mm Pilkington **Optifloat™** Clear.

Pilkington **OptiView™** Ultra DC, Pilkington **OptiView™** Ultra DC Pro T, Pilkington **OptiView™** Ultra Protect are all double-side coated products and packs will be supplied with cover plates on both sides of the pack (4 mm Pilkington **Optifloat™** Clear for float substrates and 6.4 mm Pilkington **Optilam™** for laminated substrates).

Pilkington **OptiView™** Ultra Therm and Pilkington **OptiView™** Ultra Therm Protect are arranged on stillages so that the thermally insulating coating faces to the stillage. Packs will be supplied with cover plates on both sides of the pack (4 mm Pilkington **Optifloat™** Clear for float substrates and 6.4 mm Pilkington **Optilam™** for laminated substrates). The thermally insulating coating is electrically conductive in opposite to the Pilkington **OptiView™** Ultra.

All sheets are separated with an interleaving powder to resist moisture staining and abrasion. Packs of Pilkington **OptiView™** Ultra products will be supplied with un-taped edges.

Pilkington **OptiView™** Ultra products should be unloaded and stored in dry and well ventilated conditions, stacked upright and fully supported in a safe manner. The glass should be stood on edge strips of wood, felt or other relatively soft material and care should be taken when unloading glass packs to ensure that plates in the pack do not move.

Significant temperature fluctuations during storage that may lead to condensation should be avoided.

4. Handling

Care should be taken when handling any product in the Pilkington **OptiView™** Ultra range. It is recommended, whenever possible, that all forms of glass identification are applied to the uncoated surface. When manually handling the glass, clean, dry glass handling gloves should be worn at all times to avoid leaving fingerprints or otherwise contaminating the coated surface. Gloves should be inspected before use and changed at regular intervals. Aprons should be worn to protect the coated surface from any contact with hard materials, which can cause damage to the coating. Operators should be aware that any contact with hard materials may result in damage to the coated surface.

It is essential to ensure that no metal comes into contact with the coated surface as it may result in damage to the coating. Individual sheets should be moved using automatic equipment capable of lifting plates with clean suction cups on the glass side only.

If marks are present on the coating after handling, careful attempts can be made to remove using solvent such as Isopropyl Alcohol (IPA) and a soft clean tissue. When using any solvent please be sure to read and adhere to the health and safety instructions on the label.

When internally transporting individual cut size sheets or off-cuts, a wide range of separating pads, clean, non-alkaline paper or cardboard strips should be used to prevent transit damage to the coating. Separating pads should only be applied around the very edges of the glass. Harp racks may also be used provided that they are clean, in good condition and do not allow any metallic contact.

5. Cutting

Sheets of monolithic Pilkington **OptiView™** Ultra products must be loaded onto the cutting table with the coated surface uppermost.

Pilkington **OptiView™** Ultra DC, Pilkington **OptiView™** Ultra Protect, and Pilkington **OptiView™** Ultra DC Pro T are all dual coated or laminated products with coatings on #1 and #4. In the case of these products one of the anti-reflective coatings will always be in contact with the cutting table. In order to reduce risk of damage to the anti-reflective coating the cutting table should be thoroughly cleaned and free from any substance that may damage the surface prior to cutting. Automatic cutting is the preferred option, using a quick evaporating cutting oil lubricant. Cutting wheel pressures and break-out settings on automatic cutting machines will be the same as for uncoated glass. Complex shaped glasses will be cut by hand. If manual cutting is used then great care must be taken with straight edges, metal tape measures, cutting bars or cutting sticks when placing on to the coated surface, to avoid marking. A cutting lubricant with a fast evaporation rate should be used for scoring the glass prior to break out. Care should be taken when breaking out glass sheets to ensure the coating is not damaged.

Pilkington **OptiView™** Ultra Therm and Pilkington **OptiView™** Ultra Therm Protect are double-side coated with different coatings. The thermally insulating coating must be loaded uppermost on the cutting table and the above cutting table procedure for dual coated products must be respected.

6. Washing

The following recommendations are given for machine and hand washing, spot and specialised cleaning of Pilkington **OptiView™** Ultra products.

Machine Washing

Pilkington **OptiView™** Ultra products may be washed in a vertical or horizontal multi-stage automatic washer according to the manufacturers recommended set up instructions, using heated, demineralised, neutral pH water and soft cylindrical brushes. The brush fibre diameter should be no greater than 0.15 mm. A pre-rinse before entering the washing machine is advantageous.

Initial and intermediate washing stages should preferably use deionised water, heated to a maximum of 40°C and with specific conductivity $\leq 30 \mu\text{S}/\text{cm}$. Fresh deionised water with specific conductivity $\leq 10 \mu\text{S}/\text{cm}$ should be used at the final rinse wash stage. Washing machine should be designed so that the conveyor never stops with the glass underneath the washing brushes, otherwise coating damage may occur. When using washing machine that were not initially designed for coated glass there may be a need to modify, raise or remove brush sections, barriers and internal drive rollers.

Hand washing/spot cleaning

Pilkington **OptiView™** Ultra products may be cleaned and maintained by hand washing using a non-abrasive, glass cleaning solution. For hand washing, a mild detergent and water solution is recommended. Dirt should be wiped from the surface with a suitable cleaner to ensure there is no scratching to the coated surface. The detergent solution should be uniformly applied to the glass and washed with a clean, soft cloth, or sponge. The surface should be thoroughly rinsed with clean water and wiped dry immediately.

Occasionally spot cleaning may be required to remove stubborn dirt or foreign materials that can adhere to the anti-reflective coated surface. Some spot defects and handling marks such as excess sealants, cutting oil or label adhesive residue can be removed from the coated Pilkington **OptiView™** Ultra surface using a mild, non abrasive detergent. For spot cleaning Isopropyl alcohol or a standard glass cleaner is recommended and should be applied in small quantities to a clean, dry cloth or towel, and only rubbed on the areas needing spot cleaning. The glass should then be wiped using a dry, clean, lint free towel or cloth followed by routine cleaning procedure given above. Steel wool, razor blades, abrasive cleaners, hydrofluoric acid, fluorine compounds or strong alkalis should never be used on the coated surface of Pilkington **OptiView™** Ultra glass.

It is essential to carry out a careful inspection of the anti-reflective coating before assembling into an IGU. Any residue should be removed according to the recommended cleaning instructions.

7. Laminating

Pilkington **OptiView™** Ultra Protect has been designed as a laminated product with the anti-reflective coating on the outer surfaces. The anti-reflective coating is not placed against the PVB interlayer since there are no visible reflections from that interface. Monolithic Pilkington **OptiView™** Ultra is suitable for lamination by either PVB autoclave or cast-in-place processes. When laminating, care should be taken to avoid excess interlayer material adhering to the coated surface as this may be difficult to remove completely. Laminated, Pilkington **OptiView™** Ultra Protect has a coating on both sides, therefore it should not be marked with adhesive labels/stickers, wax crayons, nor should metal objects be dragged across the surface.

8. Heat treatment: heat strengthening, toughening, bending

Prior to being laminated, monolithic Pilkington **OptiView™** Ultra Pro T can be heat-strengthened, toughened, heat-soaked or bent, after it is cut to size. It is recommended that Pilkington **OptiView™** Ultra Pro T is thoroughly cleaned and dried prior to heat treatment. Clean cotton or cloth gloves should be used at this stage to prevent hand or fingerprints, which could be burnt into the surface during heat-treating. The coated surface should be visibly clean before entering the heat treatment furnace. When heat-treating in a horizontal furnace the anti-reflective coating should be positioned facing upwards in order to minimize coating damage. However, when toughening double-sided coatings such as Pilkington **OptiView™** Ultra DC Pro T it will be necessary to process pieces with one of the coated sides facing downwards. In such cases care should be taken to ensure that the furnace rollers are clean and there is no risk of the glass skidding or sliding, especially when the rollers reverse direction. Similarly, if frit is being applied to the glass surface it may be necessary to process the glass with the coating side facing downwards the same procedure should be followed.

Since each furnace is unique, furnace times and/or temperature adjustments will be required with setting for Pilkington

Optifloat™ Clear being a useful starting point. All heat treated (toughened or heat strengthened) glasses, coated or not, may show a soft dappled shadow pattern from the furnace quench air, especially when viewed in polarised light, therefore sample plates of heat treated Pilkington **OptiView™** Ultra Pro T should be re-inspected for distortion and tested to ensure compliance to applicable safety glazing standards.

The characteristics of the coated glass surface may require adjustment of the top and bottom furnace temperatures, cycle times and convection profiles. These parameters will vary from furnace to furnace. The furnace settings for bending can initially be those for clear non-coated glass of the same thickness.

Pilkington **OptiView™** Ultra Pro T has been designed to possess a wide toughening cycle tolerance, nevertheless customers who wish to attempt bending should carry out their own evaluation to ensure that the coating is not damaged since very high temperatures may be required in the bending process, especially if a tighter radius is required.

9. Insulating Glass Units

Pilkington **OptiView™** Ultra products will require edge deletion when used in Insulating Glass Units (IGU's). Suitable sealants and desiccants should be used in accordance with manufacturers' recommendations. The adhesion of most sealants, including hot melt butyls, polysulfides, urethanes and two part silicones will be as expected for clear uncoated glass. It is recommended that no labels or taping should be applied to any coated surface of the completed IGU's.

In the case of Pilkington **OptiView™** Ultra Therm and Pilkington **OptiView™** Ultra Therm Protect, the low emissivity coating must face to the inner side of the DGU (#2 and #3) and will require the standard edge deletion.

When transporting completed IGU's, avoid any potential for damage of the anti-reflective coating that could be caused by damaged / dirty rubber pads from stillages or banding / fixing of IGU packages, it is recommended to use a float glass cover plate at both the back and front of the stillage. This is particularly recommended when well used stillages that may be dirty or in general not in good condition are being used.

10. Appearance

A customer inspection should be performed on receipt of a delivery and any defects must be reported immediately. Claims for defects identified after processing cannot be accepted since it is the responsibility of the customer to carefully inspect Pilkington **OptiView™** Ultra products during each processing stage. In the case of any claims, both samples and the batch number of the affected glass will be required. Production tolerances can cause slight colour deviations between different batches. These are minimal within a production run. At a viewing distance of 3 m it is acceptable for some mottling or streaking of the coating to appear. Slight differences between adjacent panes may be visible.

11. Mock-up construction

The construction of a full scale mock-up is recommended where the glass can be examined, from both sides, in transmission and reflection. The mock-up should be constructed and viewed on site, representing the proposed building location and viewing geometry, and should be approved prior to the final glass production.

These processing guidelines refer to the use of our coated glass products in a standard insulating glass process.

In the case of any other treatment of coated glass products, e.g. lamination, heat strengthening, toughening, processing of toughened or heat strengthened glass to insulating glass units, or where surface modifications are made to coated glass, it may be necessary to perform further processing steps.

Any such further processing that is used is solely the responsibility of the respective processors. We are unable to specify standard parameters for the systems of any third-party processors. We therefore strongly recommend that you carry out production tests in order to determine suitable settings for the respective production facilities for processing the coated glass products.

Should it be necessary to transport processed coated glass plates for insulating glass units production (e.g. to another manufacturing facility), we recommend using suitable packaging materials and glass spacers such as "Fleece".

If required, we will gladly assist you.

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, "OptiView", "Optifloat" and "Optilam" are trademarks owned by Nippon Sheet Glass Co. Ltd, or a subsidiary thereof.



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The CE marking label for each product, including declared values, can be found at www.pilkington.com/CE



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