



**Pilkington Eclipse Advantage™
and Pilkington Solar-E™**
Handling and Processing Guidelines



PILKINGTON
NSG Group Flat Glass Business



Introduction

We recommend the following handling and processing guidelines for Pilkington **Eclipse Advantage™**, Clear, Blue-Green, Bronze, Grey, Evergreen, Arctic Blue and Pilkington **Solar-E™** glass. Although individual fabricating conditions will vary, the guidelines in this bulletin offer an excellent starting point for optimizing typical operations.

1. Product description

Pilkington **Eclipse Advantage™** and Pilkington **Solar-E™** are both hard, on-line coated solar control glasses with low emissivity, which provides improved energy management to glazed windows. It has excellent scratch resistance and durability and in most circumstances can be treated the same as uncoated glass. However, it should be remembered that both are comparatively high-value products and therefore, it is all the more important that it's handling and processing is carried out in accordance with good glass and glazing practices.

2. Product range

Pilkington **Eclipse Advantage™** is available in 4 mm and 6 mm thicknesses in stock sizes up to 3210 x 2240 mm.

Pilkington **Solar-E™** is available in 6 mm and 8 mm thicknesses in stock sizes up to 5180 x 3300 mm with maximum sizes for toughened and Insulating Glass Units (IGU) on request.

All sheets are separated with an interleaving material to resist moisture staining and abrasions between individual sheets.

3. Delivery and storage

Pilkington **Eclipse Advantage™** and Pilkington **Solar-E™** are generally arranged on stillages so that the uncoated surface of each sheet faces outwards.

Pilkington **Solar-E™** and Pilkington **Eclipse Advantage™** must 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. It is generally presented with its coated surface innermost.

Pilkington **Eclipse Advantage™** and Pilkington **Solar-E™** should never be removed from cases by “end opening” the case since sliding glass surfaces across each other may damage the reflective coating or the glass surface.

4. Handling

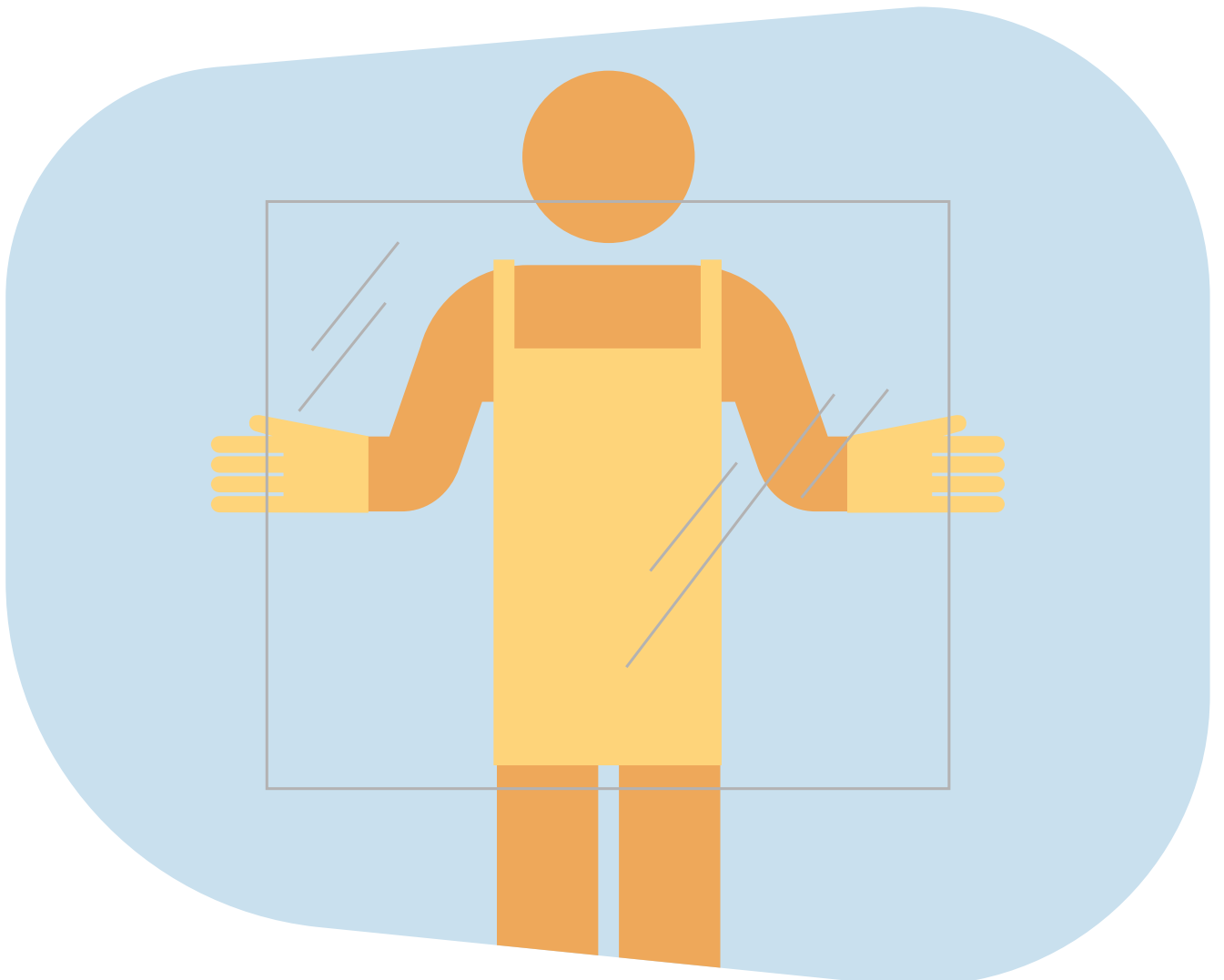
Since the coated surface can be damaged if not handled correctly, precautions are necessary when unloading and storing glass packs to ensure no movement of the sheets in the pack. Care should be taken to avoid excessive contact with the coated surface of the glass.

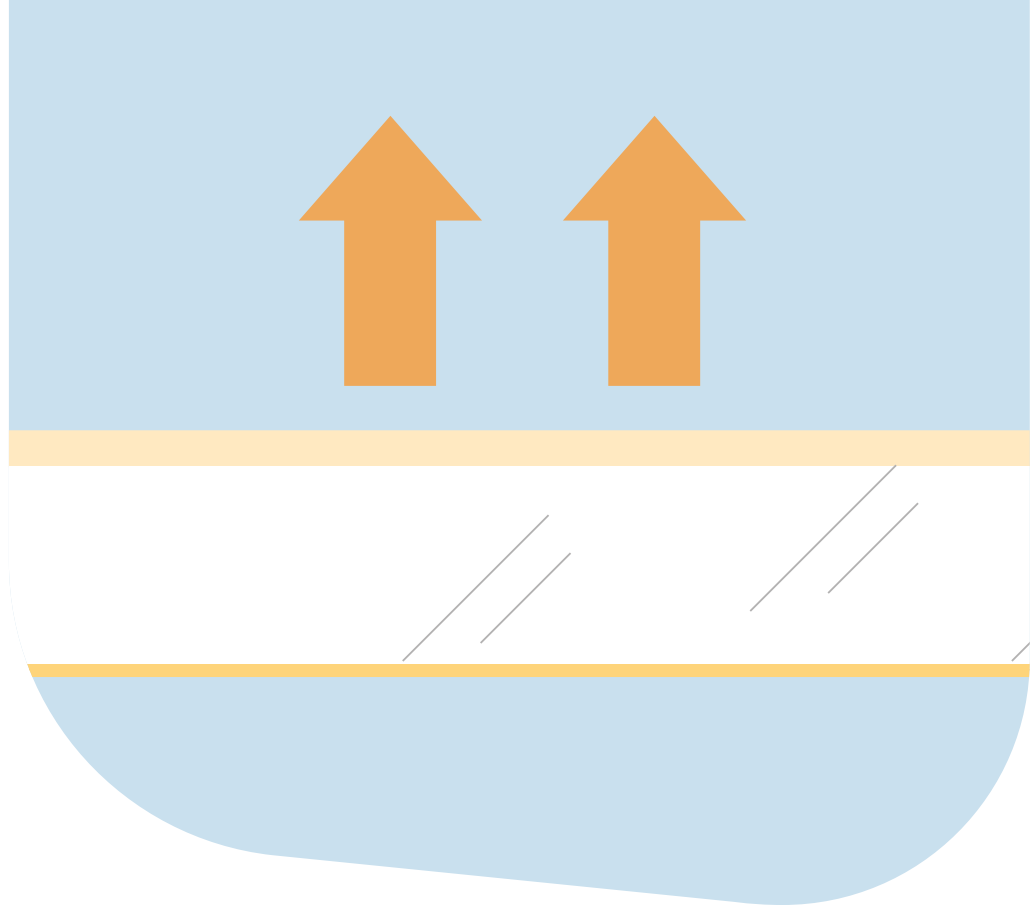
Where possible, individual sheets should be moved using automatic equipment capable of lifting plates with clean suction cups on the glass side only.

When handling the glass, clean, dry glass handling gloves must be worn at all times to avoid leaving fingerprints. Gloves must be inspected before use and changed at regular intervals. Operators should be aware that any contact with hard materials is likely to result in damage to the coated surface. Labels and

identification marking such as wax crayons should only be applied to the uncoated surface. If marks are present on the coating after handling careful attempts can be made to remove them manually using a solvent such as IPA and a soft clean tissue. We recommend that any form of identification should always be on the uncoated surface.

It is recommended that a risk assessment is undertaken to identify the hazards to people during handling. Always use the correct personal protection equipment when handling glass including eye protection, safety footwear, cut-resistant apron, cuffs and gloves. Pilkington **Eclipse Advantage™** glass and Pilkington **Solar-E™** should be cut, washed, and generally processed with the reflective coated surface facing up.





5. Cutting

Sheets of Pilkington **Eclipse Advantage™** and Pilkington **Solar-E™** must be loaded onto the cutting table with the coated surface uppermost. Automatic cutting is the preferred option using a quick evaporating cutting oil. When cutting by hand care must be taken to ensure the coated surface does not come into contact with metal objects such as tape measures, belt buckles, studs, watch straps etc. so as not to leave metal deposits on the glass surface. When breaking out glass sheets, care should be taken so that the coating is not damaged.

When handling glass, operators must wear clean, dry glass handling gloves. Gloves must be inspected before use and changed at regular intervals. Operators should be aware that any contact with hard materials is likely to result in damage to the coated surface. As the glass should be processed with the coated surface up, special attention should be paid to any parts of the process which involve contact with the upper surface (e.g. the method of tracking the score) to ensure that they do not mark the glass.

Pilkington **Eclipse Advantage™** glass and Pilkington **Solar-E™** should be cut with the coated side up to eliminate coating damage that could result from glass particles on the cutting table.

Stock Sheets

The fabricator is responsible for cutting stock sheets to eliminate imperfections from the finished cut piece.

6. Washing

Pilkington **Eclipse Advantage™** and Pilkington **Solar-E™** have a pyrolytic low-e coating. The following recommendations are for washing coated glass:

Mechanical Washing

Pilkington **Eclipse Advantage™** and Pilkington **Solar-E™** should be washed, with the coating side up, in a rotating drum brush flat glass washing and drying machine. Pilkington recommends using a detergent solution of hot 50-60°C clean water and a commercial detergent designed for glass washing. The final rinsing should be with clean deionized water heated to at least 43°C. As with all washing machines, either the water should be changed on a routine basis or a continuous overflow system should be used. Drying air should be filtered and controlled in such a manner so as not to leave water droplets on the glass surfaces.

Polypropylene brush rolls have a lower co-efficient of friction and are recommended for glass washing machines as they are softer and more flexible. Nylon brushes should be properly

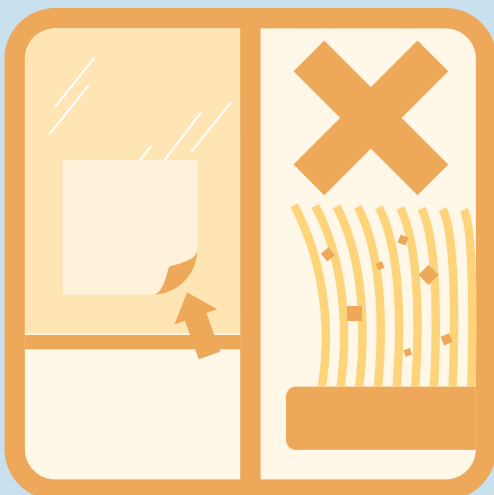
adjusted to avoid the possibility of coated surface damage. Brush height settings should be such that only the bristle tips sweep the glass surface, rather than the sides of the bristles, uniformly across the glass width.

We do not recommend the glass to remain stationary under rotating brushes.

It is recommended that a test piece be run through the washer before starting production. The glass should then be inspected, in transmission and in reflection, with a bright spotlight close to the reflective surface to determine if brush and/or air drying adjustments are needed. If abrasive materials are trapped in any washing equipment, abrasion damage to the glass can occur.

Hand Washing

Pilkington **Eclipse Advantage™** and Pilkington **Solar-E™** may be cleaned and maintained by hand washing with non-abrasive cleaners. For hand washing the glass, a mild detergent and water solution is recommended. Uniformly apply the solution to the glass and wash with a clean, soft cloth, sponge, or pad. Rinse thoroughly with clean water and wipe or dry immediately. Make sure no metal parts of the cleaning equipment touch the coated glass surface, and that no abrasive particles are trapped between the glass and the cleaning materials. Do not use HF (Hydrofluoric) acid, harsh chemical cleaners, abrasives, steel wool, or razor blades on the coated surface.



7. Laminating

Pilkington **Eclipse Advantage™** and Pilkington **Solar-E™** can be laminated. When laminated the coating should face away from the interlayer to preserve its solar and thermal performance values. If the glass is laminated with the coated surface towards the interlayer this will result in a small reduction in reflectivity, an increase in transmission and a small change in the reflected colour. It may also adversely change the thermal properties by masking the low-e effect. We recommend that each laminator conduct in-house adhesion tests, prior to actual production, to determine if an adequate bond has been obtained.

8. Toughening

Heating

Pilkington **Eclipse Advantage™** and Pilkington **Solar-E™** can be heat-strengthened, fully toughened or bent, after it is cut to size. We recommend that either type of glass is thoroughly cleaned and dried prior to heat-treating. The glass should be visibly clean at this stage to eliminate hand prints, fingerprints or other marks, which could be burnt into the surface during heat-treating. The low-e coating can be facing up or down when heat-treating in a horizontal furnace. If the furnace rollers are clean, the glass can be processed with the coating down. As with all low-e coated glass, when the coated side is facing up, it will reflect radiant heat and so it will require a longer furnace cycle to achieve the same uniform temperature as uncoated glass of the same tint and thickness. Please note that when the coated side is facing up, the bottom surface will run hotter and there is a possibility of roller marking or center-rub from temporary, concave surface up, warping.

Toughening furnaces of different manufacture and models will have different heating/quenching regimes. Therefore, it is recommended that processors consult their furnace manufacturers to establish those conditions for toughening which are most suited to their particular plant so as to maintain the properties of Pilkington **Eclipse Advantage™** and Pilkington **Solar-E™**.

Quenching

Care must be taken not to overheat Pilkington **Eclipse Advantage™** or Pilkington **Solar-E™** since optical distortions such as bow, warp, ripple, or roller wave are inherent in all heat-treated glass products and reflective glass accentuates these distortions. Care must be taken not to overheat Pilkington **Eclipse Advantage™** glass or Pilkington **Solar-E™**. Overheating the glass will cause excessive visible distortion and could damage the coating. If excessive distortion or coating damage is experienced, a cooler glass temperature during the heat-treating process will be required. This is best achieved by shortening the furnace cycle time rather than changing top and bottom furnace temperature settings. Please note that the glass temperature should not exceed 640°C.

Sample panes of Pilkington **Eclipse Advantage™** and Pilkington **Solar-E™** should be tested to ensure compliance with applicable safety standards and inspected for distortion prior to starting production. Confirmation that the glass will meet or exceed all applicable safety glazing standards is the responsibility of the fabricator.

Heat-treated (toughened or heat strengthened) glass can often show a soft dappled shadow pattern from the furnace quench air when viewed in polarized light. The higher daylight transmitting Pilkington **Eclipse Advantage™** glass (Clear, Blue-Green, EverGreen and Arctic Blue) with a reflective coating, will show this more readily.

9. Opacification

Pilkington **Eclipse Advantage™** and Pilkington **Solar-E™** can be opacified for use in spandrel panels with typical ceramic frits or water based silicone opacifiers applied to the reflective surfaces. Note: applying opacifiers to the coated surface will change the appearance by reducing its reflectivity, and will mask the low-e property.

We recommend that when opacified on the coated surface, samples should be viewed for change of coating reflectivity and colour. When using silicone materials as an opacifier, the material supplier should be asked to supply adequate proof of long term durability.

Pilkington **Eclipse Advantage™** and Pilkington **Solar-E™** can have fluorine free ceramic frits or enamels applied to the coated side. A test piece should be run with the desired frit to ensure satisfactory results. The glass can be successfully processed with the coated side down provided the furnace rollers are clean and there is no sliding or skidding of the glass on the rollers due to excessively rapid speed changes or travel direction reversals.

10. Spandrel glass

We recommend that, in general, glass is toughened when used in spandrel applications. For optimum uniformity between vision and spandrel glass, Pilkington **Eclipse Advantage™** spandrels should be fabricated by constructing an Insulating Glass Unit (IGU) similar to the vision unit, with the reflective coating on the same surface (typically #2) as the vision units, and with a dark grey colour ceramic opacifier applied to surface #4 of the IGU.

Using heat-treated insulating glass with ceramic enamel on the surface #4 (room-side) will eliminate read-through, minimize banding effects, and ensure a stable spandrel design. In order to withstand the high temperatures in spandrel panels insulating glass sealants should meet a high performance standard.

Pilkington acknowledges that a number of factors make it difficult to achieve uniformity between vision and spandrel glass areas.

11. Glazing considerations

Pilkington **Eclipse Advantage™** and Pilkington **Solar-E™** products are not intended for use in surface #1 installations or single glazing.

12. Insulating Glass Units

Pilkington **Eclipse Advantage™** and Pilkington **Solar-E™** can both be incorporated into an Insulating Glass Unit (IGU), with the reflective coating on surface #2 (outer pane facing the cavity). It is not intended for use as single glazing. When laminated the coating should be facing away from the PVB interlayer to preserve its solar and thermal performance values.

Pilkington **Eclipse Advantage™** or Pilkington **Solar-E™** are used as the outside pane with the coating on surface #2 of the IGU. No edge deletion of the reflective coating is required. Pilkington **Eclipse Advantage™** and Pilkington **Solar-E™** are compatible with typical polysulphide, urethane and silicone IGU sealants. It is the responsibility of the fabricator to ensure that the appropriate sealant is used for each application. Specific questions concerning compatibility should be directed to, and confirmed with, the individual sealant manufacturers.

For thermal safety reasons it may be necessary to heat treat the outer glass of an IGU with Pilkington **Eclipse Advantage™** and Pilkington **Solar-E™**.

IGUs incorporating Pilkington **Eclipse Advantage™** or Pilkington **Solar-E™** should be glazed in accordance with BS 8000:1990: 'Workmanship on building sites – Part 7. Code of practice for glazing' and BS 6262.

13. Mock up construction

A full-scale mock-up is recommended, where the glass can be examined, from both sides, in transmission and reflection. A full-size mock-up, including both vision and spandrel glass, should also be constructed and viewed on site, representing also the proposed building location and viewing geometry, and should be approved prior to final glass product selection and production.

14. Transportation & Storage of Insulating Glass Units

Care should be taken with the manufactured Insulating Glass Unit (IGU) to ensure adequate protection of the surfaces. Spacers or interleavants material should be used during storage and transport. The surfaces should also be covered with standard plastic wrap if additional protection is required. Once on site the glass should be stored under cover to protect it from outdoor elements.

15. 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 **Eclipse Advantage™** and Pilkington **Solar-E™** 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. For projects where the coated glass has to be supplied over a longer period and therefore several coating runs, this should be indicated to the manufacturer to ensure that colour deviation is minimised.



This publication provides only a general description of the product. Further, more detailed information may be obtained from your local Pilkington Building Products supplier. It is the responsibility of the user to ensure that the use of this product is appropriate for any particular application and that such use complies with all relevant legislation, standards, code 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, “Eclipse Advantage” and “Solar-E” are trade marks of Nippon Sheet Glass Co. Ltd.

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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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