

Low-emissivity (low-E) Glass

High performance energy efficient glass

Description

Orient Low-emissivity glass have two kind: one is on-line low-e glass, one is off-line low-e glass,

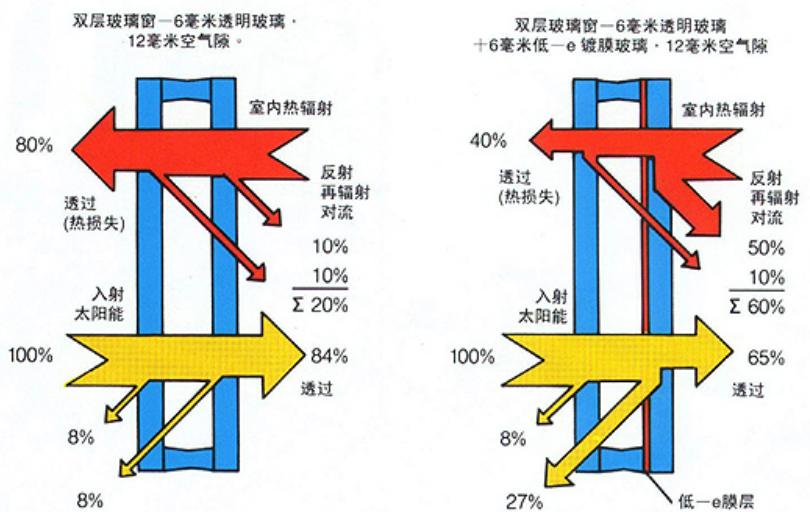
The on-line low-e glass have good physical performance, which can be stocked within one year, and can be tempered, any Edgeworked. They are coated under 600°C.

The off-line low-e glass have good technical performance, which can be stocked and must be made by double-glazing glass within 24 hours, and can be tempered, any Edgeworked, they are coated under 200 -300°C,

What is a Window Energy Rating?

Window Energy Ratings were launched in early 2004 by the British Fenestration Rating Council (BFRC), an independent organisation dedicated to improving the energy efficiency of fenestration products. In late 2006 the BFRC became part of the Glass and Glazing Federation to ensure that appropriate management systems and organisation were developed to cope with increasing demand for window ratings. A window's rating is determined by a formula which takes into account available solar heat gains (window g-value) and subtracts the thermal losses (window U-value and air leakage).

- $WERs = \text{Solar Gains} - (\text{Thermal Losses} + \text{Air Leakage})$
- $WERs = 218.6 \times g \text{ window} - 68.5 \times (U \text{ window} + L50)$



Improving Window Energy Ratings

The overall performance of a window is dependent on the combined effect of the frame and glazing components and the air-tightness of the finished window. Ratings may be improved by decreasing thermal losses and/or by increasing solar gains.

Decreasing thermal losses

- **Type of low-E glass:**

With its optimised balance of very low emissivity and high solar gain Orient low-e glass, Total can improve the energy index for a given window by more than 5 kWh/m²/year* when compared to hard coated low-E products.

- **Inert gas filling:**

Argon gas filling can improve the energy index for a given window by about 11 kWh/m²/year* compared to an air filled unit.

- **Optimised cavity width:**

The optimum cavity width for an argon filled unit is 15mm (10mm with krypton).

- **Warm edge spacer:**

Using high performance warm edge products such as Orient processing and Edgeworked glass can improve the energy index for a given window by about 7 kWh/m²/year* compared to standard aluminium spacer bars.

- **Frame type:**

U-values can be reduced with advanced materials and design.

*frame factor of 30% and Uf of 1.8

Orient Low-emissivity glass - Enhanced thermal insulation



Handling, Processing, Installation & Maintenance

The products are high performance low-emissivity (low-E) sheets of glass. The transparent metallic oxide coating offers enhanced thermal insulation, by reflecting heat back into the building, greatly reducing heat loss and therefore reducing heating bills

In order to maintain the special properties of this glass, the following instructions must be adhered to carefully.

Receipt of glass

Care must be taken to ensure the coating position is as ordered. Labels are never placed on the coating.

- Handling instructions on the packaging must be respected.
- Before processing, glass sheets should be inspected visually for quality.
- For further guidance please refer to the document 'Guidance for Use, low-E Coated Glass'.

Storage

Orient Low-e glass can be stored for up to 12 months from the date of receipt. The usage of the product as part of a first in, first out rotation system is recommended.

- Once the glass is being processed (i.e. removed from the pack) it must be assembled into double glazing generally within 3 days.
- See also the storage section, 2.3 in the 'Guidance for Use, low-E Coated Glass'.

Cutting

- Place the sheet on the cutting table with the coating facing upwards.
- Cut the glass from the coated side.
-
- If necessary, use vapourising cutting oil sparingly.
- Do not wipe glass spall away with your hand. If necessary use dry, oil-free compressed air or a portable blower.
- Between cutting and further processing, store the glass sheets carefully by means of interleaving paper or flexible, non-adhesive pads to separate the individual panes. This is particularly important when different sizes of glass are to be stored.
- Best practice is to further process the cut panes as soon as possible after cutting.

Edgeworked

- It is essential that the glass is edge-stripped before assembly into double-glazed units to:
 - prevent oxidation of the coating edge.
 - ensure secondary seal bond strength.
- Ensure that grinding dust is sucked away to avoid scratching.

It is good practice to edge work the glass directly after cutting. Provided it is stored under required condition, the glass must be edge worked within 24 hours from cutting (off-line)

Washing

It is recommended to wash the glass immediately after wet edge working. The time glass can be kept between edge working and washing critically depends on the quality of the water used during edge working.

Glass washing is a critical step in achieving a high quality end product.

- Do not use detergent.
- Use demineralised water.
- Use flexible (soft) brushes only.
- Ensure that the glass sheet does not stop inside the washing machine.
- No water must remain on the coated surface after the drying process.
- The washing machine must be regularly maintained.
- Avoid any friction or contact on the freshly cleaned, coated surface.

Tempered

It is good practice to temper the glass directly after washing. Provided it is stored under required conditions, the glass must be tempered within 24 hours after washing.

- All friction or contact with the washed, coated side should be avoided.
- The kite-mark, if any, of the toughened glass pane is always on the coated surface
- Do not use SO₂ in the furnace when toughening
- Assemble panes in to units ideally within 24 hours
- Clinging polyethylene film (e.g "blue film" from Britton Merlin) to the coating directly after tempering is found to increase the time the glass can be kept between tempering and DGU production by about 3 days.
- If suitable protective packaging is provided, the shelf life maybe extended for up to 2 weeks.
- For more information please also refer to sections 3.7, 3.8 & 3.9 in the 'Guidance for Use, Low-E Coated Glass

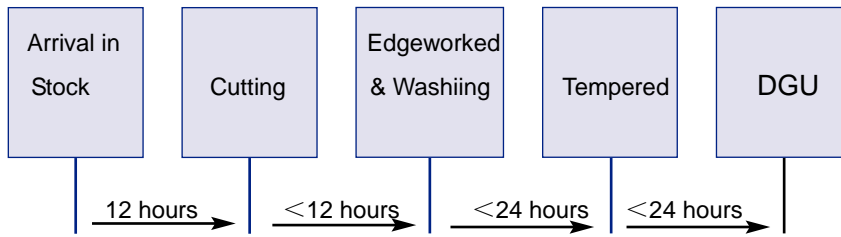
Manufacture of insulating glass units

Orient low-e glass sheets must always be assembled into an insulating glass unit.

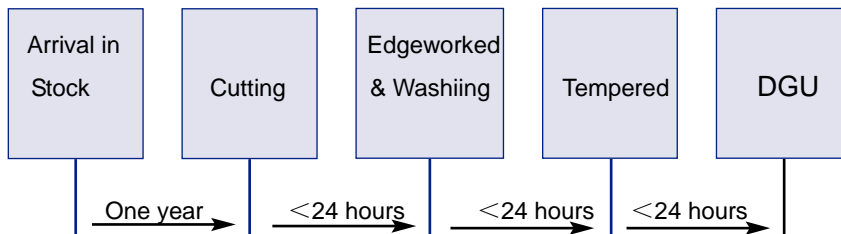
- However, appearance will differ according to where the coated surface is positioned. Therefore, it is recommended that the coating is always placed on the same face throughout a given project.
- The coating should normally face outwards on the production line to avoid contact with the guide rollers.
- All types of secondary seal can be used.
- Georgian bars can be used with small rubber pieces as protection against rattling on the bars.
- Leaded strips should not be applied to the coated surface.

Processing time line

1. Orient Off-line low emissivity glass



2. Orient On-line emissivity glass



Double-glazing Glass unite

