

SOLAR CONTROL

MAKING A CLEAR CHOICE ABOUT GLASS

Low Emissivity (or Low-E) glass is one of the latest additions to solar control glazing. However, sealed unit technology makes possible a range of literally millions of options. Derek Shore of Solaglas Advanced Glass Products gives a brief introduction to the subject.

High performance sealed insulating glass units incorporating a low emissivity coating are becoming better known and accepted. Rightly so, for the benefits that they offer will, in all probability, make them the standard unit specified within the next 5-10 years. What does not appear to be so well-known or understood, however, is the width of options available using low emissivity coatings and where other coated glasses fit in.

The aim of this article is to unravel a few knots and point to ways in which the specifier can take advantage of the products and technology now available.

Properties and benefits

To start with, a simple summary of the properties and benefits of a sealed unit incorporating a low emissivity glass. The example quoted is for an Ultrawarm Plus unit with an outer pane of 6mm clear float, 12mm gas-filled cavity and an inner pane of 6mm clear float with a low emissivity coating. Other types of low emissivity coatings, cavity widths and cavity fillings (air or gas) will give slightly different figures.

Energy saving. This unit is more than three times more efficient than outdated single glazing, 50 per cent more effective than conventional double glazing and significantly better than triple glazing.

The U values for typical examples are Ultrawarm Plus 1.6, triple glazing 2.1, conventional double glazing 2.9 and single glazing 5.4 W/m²K.

Somebody is sure to ask how it works.

Low emissivity coatings can be best visualised as a transparent mirror which allows through solar radiant heat from outside the building in the form of short

wave solar energy. When the heat from outside lands on carpets and other furnishings it is absorbed and is re-radiated in a different — long — wavelength. This is the same wavelength that radiators, light fittings and we humans also generate.

Our transparent mirror has been specially formulated to reflect this heat, a high proportion of which is thereby kept within the building. The use of an inert gas such as Argon in the cavity, in place of air, further increases the thermal insulating properties of the unit.

Condensation is reduced as are the sometimes costly and unsightly results of excessive condensation such as rotting frames and spoil decorations.

Condensation is reduced because the inner glass pane is warmer. For example with an outdoor temperature of -10°C and an inner temperature of 20°C the temperature of the inner pane of our low-E unit would be 14°C, conventional double glazing 9°C and single glazing 0°C.

Down draughts and cold spots near windows are reduced because the inner pane is warmer, allowing fuller use of a room.

Low emissivity glass needs no special frames (unlike triple glazing) and it costs no more to glaze than a conventional sealed unit.

Low-E works 24 hours a day, 365 days a year!

A common question is what happens in summer. Direct heat from the sun is transmitted through the low emissivity coating as normal.

However, a considerable proportion of heat entering buildings in summer is in the form of long wavelength heat reradiated from nearby buildings, pavements etc. A high percentage of this heat is reflected back outside, therefore there is normally no excessive heat build-up in the average dwelling using a low emissivity glass.

Solar Control plus Low-E

This leads on to the options for commercial and other buildings where solar control, with or without a colour, is

desired.

It may come as a surprise but there are more — many more — options in our joint 'kit bag' using a low emissivity coating than with conventional units. The first point to note then is that with low emissivity units we are more likely to provide what specifiers want.

The most economical solar control units incorporating a low emissivity coating are those manufactured from standard body-tinted solar control glasses such as bronze, grey, green or (at an extra cost) blue, together with a low emissivity glass type available in stock sheets.

The most economical reflective glass units would use the same low emissivity glass types combined with the more economical reflective glasses.

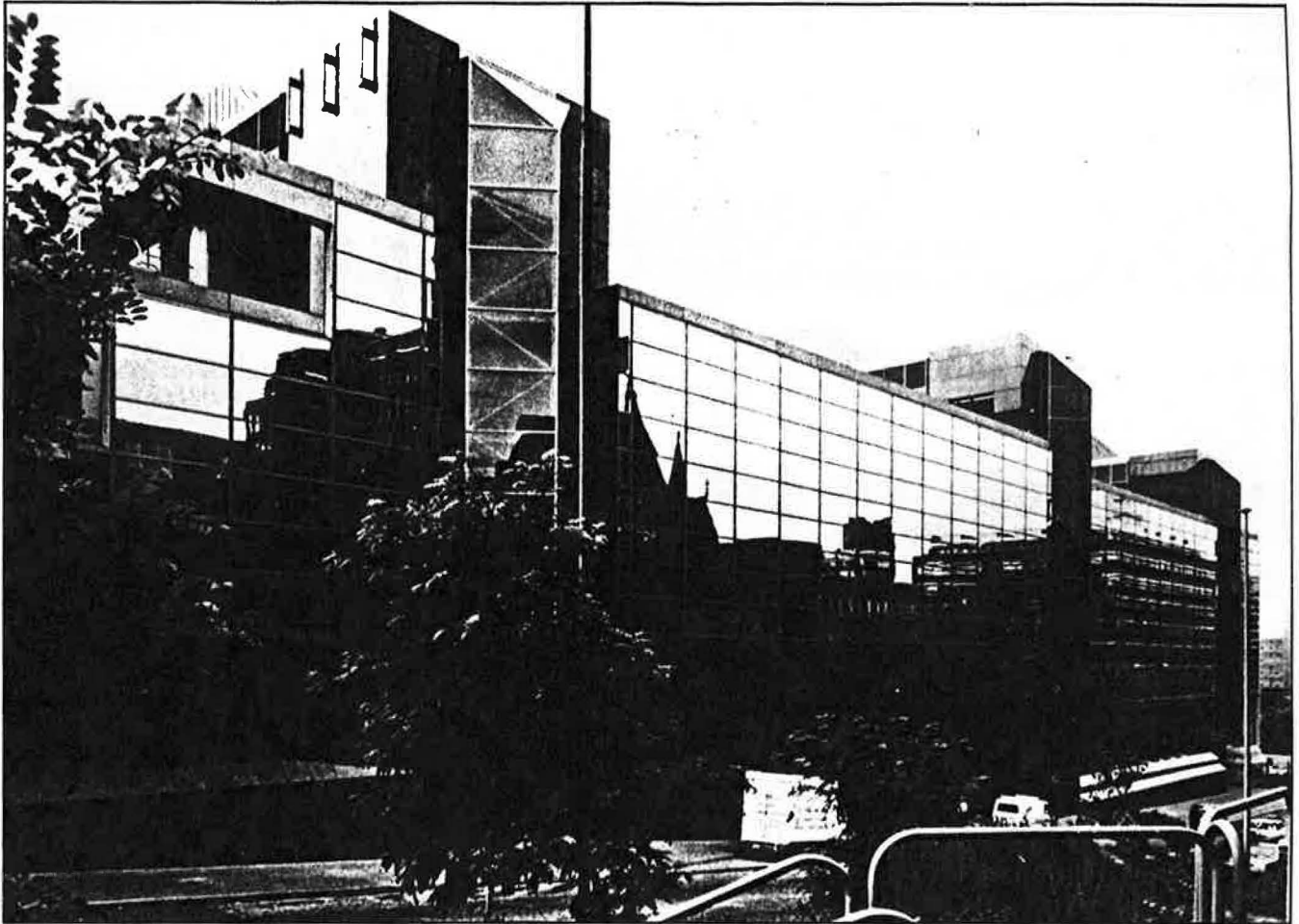
Where a wider variety of colours and/or performances are requested units can be manufactured with more specialist coated solar control glasses such as the Solascrene range (a choice of 3 blues, greys, silvers and bronzes) and a stock low emissivity glass.

Such units are even more energy efficient as the coated surface on a product like Solascrene has a lower emissivity than for example the surface of clear, body tinted or standard reflective glasses and the net effect of this is to reduce the U value for a 6-12-6 unit, gas filled, from 1.6 to typically 1.3 W/m²K.

Units with a solar control glass reduce the amount of heat entering a building. This makes good sense, as with large glass areas facing south the extra cost of the glass can often be offset by a reduction in the size of air conditioning plant, not forgetting the consequential reduced running costs of a smaller plant.

Even more important to the client will be the more pleasant working atmosphere in the building made possible by the glass reducing glare and solar heat gain. Normally the better a glass or sealed unit is at reducing solar radiant heat transmittance, the more the level of light transmittance is proportionally reduced.

Coatings have been developed which are specifically formulated to provide effective solar control with maximum light



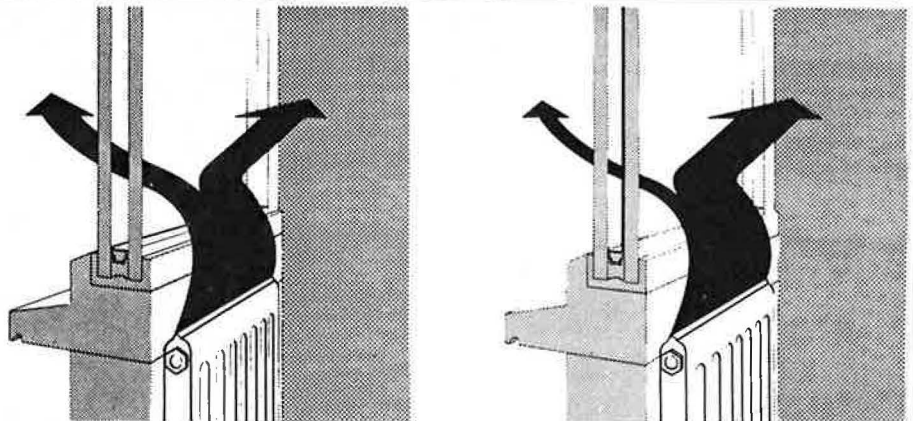
transmission and low emissivity all in the one coating. These coatings have a limited shelf life when not in a sealed unit and are therefore often made to a specific order. Price is consequently towards the top end of the range.

Examples of two units with these properties from the Ultrawarm Reflectasun range are Grey-Blue 50/36 and Gold 40/27. The first number being the light transmittance and the second number the total amount of solar radiant heat transmitted.

The performance range which these special coatings cover however is very wide and included in the range are solar control units with maximum performance, for example Ultrawarm Reflectasun Silver 10/9 which offers a U value of 1.4 W/M²K.

Certain colours can only be manufactured using these special coatings — some of the more exotic colours from the range being Aurore, Cognac, Gold, Metallic and Purple.

While many solar control units are chosen because their attractive appearance will help to enhance a building, sometimes a high performance unit is required with solar control but without a noticeable colour. Applications include museums, art galleries and listed buildings. This is possible using a special coating or by the use of a separate low emissivity coated glass in conjunction with



Top: Solaglas Ultrawarm Reflectasun Silver at Britoil's Glasgow headquarters. **Above:** (left) with conventional double glazing a substantial proportion of the long wavelength energy produced by heating systems is still lost through the glass. (Right) the Low E coating popularised by Pilkington's Kappafloat Glass applied to the inside pane of a double glazed unit will "reflect" a greater part of this energy back into the room.

a specialist solar control glass such as Irox. A sealed unit with Irox AO on Clear gives a 46/41 nomenclature and the same unit with Irox A1 on Clear allows 35 percent light transmittance and only 32 per cent solar radiant heat transmittance (35/32).

For specifiers and users worried about accidental damage to glass coatings during site operations or by window cleaners there is good news: low emissivity coatings are always inside the sealed unit.

Most solar control glasses also require the coating to be inside the sealed unit on surface 2 (the surface of the outer glass facing the cavity). Glasses such as the

Stopsol solar control range have durable coatings which are glazed on surface 1 (ie the surface on the exterior of the building) as standard — even these however can be glazed with the coated surface on surface 2 if required, but this is only normally done to intentionally vary the appearance. For example Stopsol on Bronze glazed with the coated surface on surface 2 will no longer appear reflective but a dark tinted bronze glass.

Sound reducing units with a low emissivity glass can be constructed in the same way as sound reducing units with a conventional thermal performance; that is, by using different glass thicknesses, cavity

SOLAR CONTROL

widths and in some cases heavy gas.

Compliance with BS 6262 is no problem as tempered or laminated low emissivity glass can be supplied — and in the case of special soft coatings, these are applied to glass which has already been tempered or laminated.

The latest in technological achievement using a low emissivity coating is a high performance sealed insulating glass unit which is also a heating system. Units are wired to a power supply and controlled by a thermostat. The electricity heats the complex low emissivity coating which is inside the cavity of the unit. The inside glass is capable of being heated to 60°C which is more than sufficient as a heat source. Less than 20 per cent of the heat generated is lost to the outside of the building.

So, if the customer is a developer that wants maximum floor area, letting and usage potential, with floor and walls free from protruding radiators and heaters, or alternatively is wondering how or if to heat a conservatory or a swimming pool and wants freedom from condensation, a solution can be found with this type of glass.


Glazing suppliers armed with more product options than ever before are

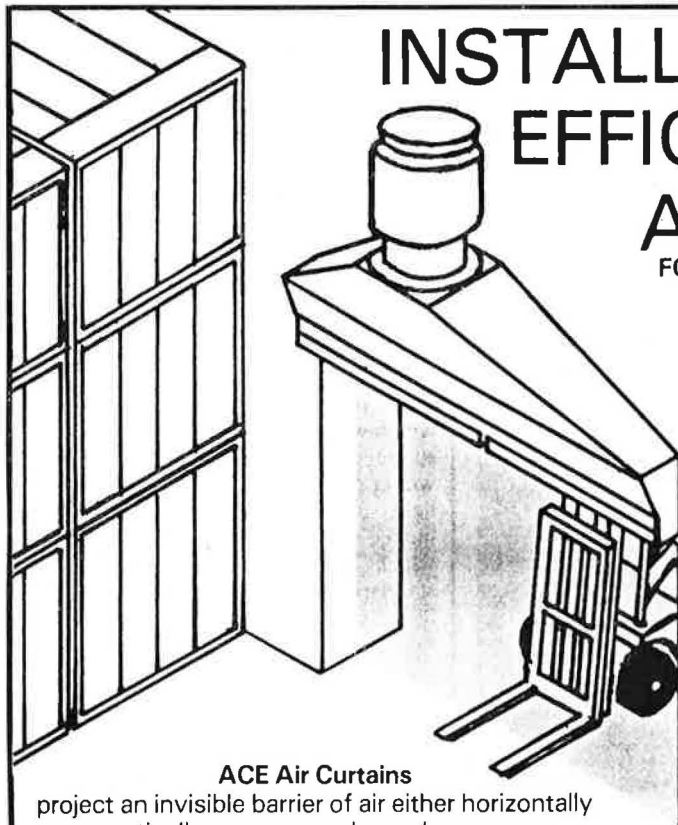


today confident that they are very likely to be able to offer glass to meet the specifier's aesthetic and performance specifications. The only problem may be the sheer number of possible product options — around three million in the Solaglas Ad-

Solaglas Ultrawarm Prestige Stopsol at Bedford Park In Croydon.

vanced Glass Products range alone — so that buyers might need help selecting the most appropriate product options.

CIRCLE 267 



INSTALL HIGH EFFICIENCY ACE AIR CURTAINS

FOR ENERGY SAVINGS OF AT LEAST 80%

Any open door or aperture results in air-movement. If you are spending ever increasing sums of money to heat or specially condition the air within your premises the losses incurred are directly proportional to the amount of time the door remains open.

The more your door or aperture is used the more important ACE Air Curtain protection becomes.

ALL ACE Air Curtains are individually designed to suit each application and every unit is built from the finest materials and is works tested prior to despatch.

ACE Air Curtains
project an invisible barrier of air either horizontally or vertically across your busy doorways or conveyor openings to prevent the entry of cold external winds without impeding your staff or damaging your goods.

AIR
CURTAIN
ENGINEERING LIMITED

P.O. BOX 19, HAVERHILL,
SUFFOLK, CB9 0HL. TEL: 0440 704641

