STAY WARM

STAY COMFORTABLE WITH GLASS

Heat escapes easily through ordinary glass. Consider glass energy solutions to build energy efficient buildings in situations where keeping the heat in is important.

When establishing window energy performance, ensure that all energy performance figures are based on NFRC conditions.

STOP UP TO 70% OF HEAT LOSS

*by using a Low E double glazed unit in your window.

Select glazing with a U Value in the range of 2.7—1.8W/m²K

STOP UP TO 55% OF HEAT LOSS

*by using a double glazed unit in your window.

Select glazing with a U Value in the range of 3.2—2.7W/m²K

STOP UP TO 39% OF HEAT LOSS

*by using single glazed pyrolytic Low E glass in your window.

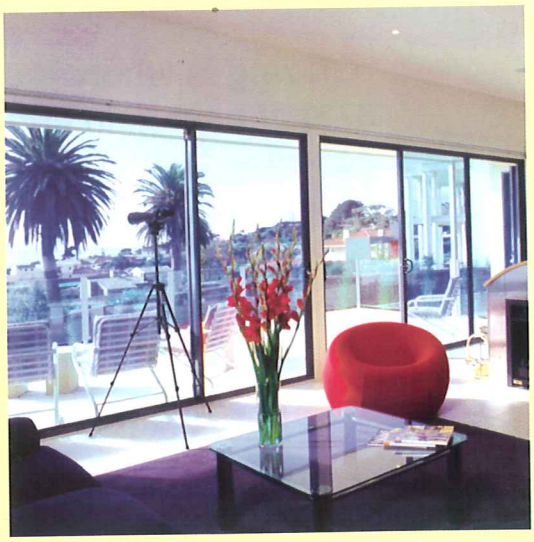
Select glazing with a U Value in the range of 4.2—3.6W/m²K

(standard 3mm glazing offers little resistance to heat loss)

GLASS & GLAZING ASSOC'N AGGA OF AUSTRALIA

*The performance figures shown above are based on heat gain through glass only.
Data was calculated using NFRC 100–2001 environmental conditions and Window 5.2 software from Lawrence Berkeley National Laboratory (2006).
Savings are in comparison to using 3mm clear glass and may vary depending on actual operating conditions.

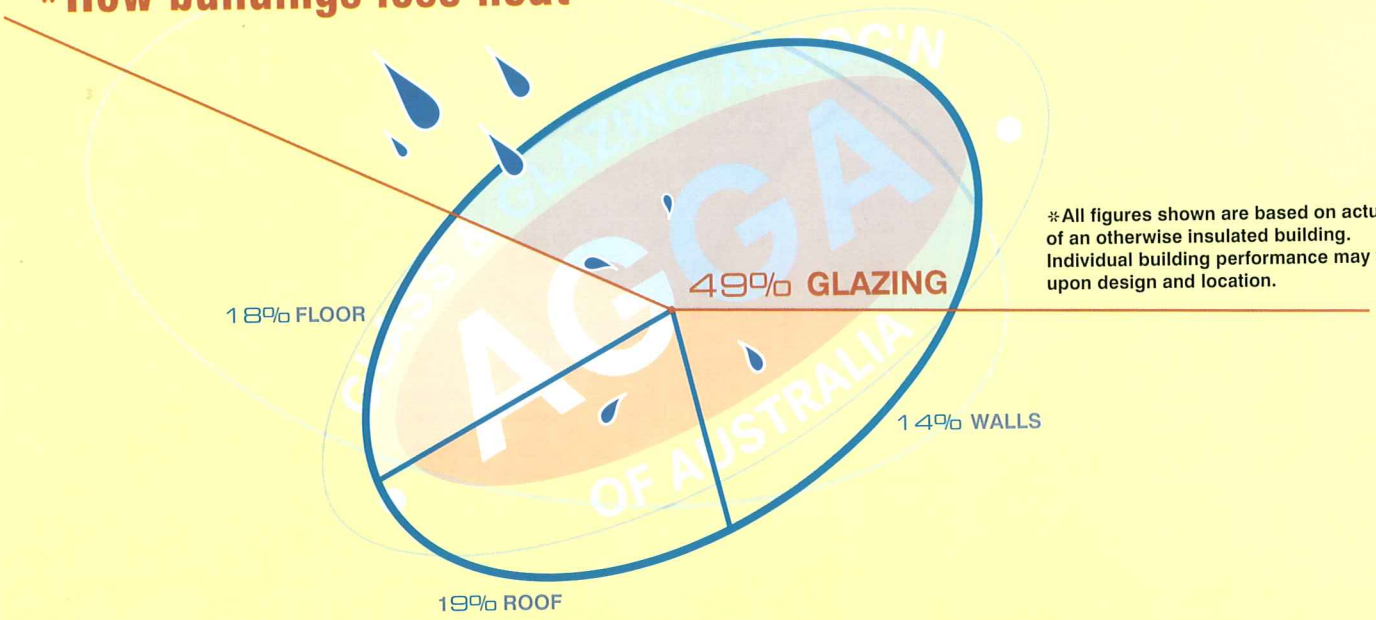
Second edition, printed September 2006, outdates any previous similar publications



Smart choice of glazing lets you control how much heat enters or escapes from a building. Understanding specifications of thermal transmittance (U value) and Solar Heat Gain Coefficient (SHGC) are key to selecting glazing that will help keep your project warm in winter and cool in summer.

– Bernard Hockings, ABSA

*How buildings lose heat



*All figures shown are based on actual case studies of an otherwise insulated building.
Individual building performance may vary depending upon design and location.

Why we need to change our ways

While Australia may be world leaders in science, research and sporting achievement, when it comes to energy efficiency, our residential windows are the worst performing in the western world.

New energy building legislation is being introduced Australia-wide, as governments recognise the economic and environmental benefits.

The need to improve the thermal performance and especially the glazing performance for all new buildings has been identified.

This means that buildings will be easier to keep cool in warmer climates and to retain heat in cooler more temperate climates.

Appropriate building design

Australians are renowned for their love of the great outdoors, and that also extends to the way we live, with indoor areas being designed to maximise natural light and to open up and enhance living areas.

Glass is a major component in contemporary design in both commercial and residential buildings. Advanced engineering has allowed for large walls of glass to be incorporated into modern designs, merging the garden, and the view with the interior of a home.

An increased level of comfort and lifestyle is gained with improved natural light and inviting sun-filled living areas. Performance glazing will allow for complete design freedom.

- As most building blocks do not allow for optimum orientation, the installation of energy efficient glazing allows for sound thermal performance.
- Energy efficient glazing also allows for greater design freedom, as it enables more and bigger windows without restricting your ability to meet energy rating requirements.
- It will allow for the installation of significantly reduced sized cooling systems, providing further cost savings.
- Energy efficient glazing can also minimise glare, enabling views to be fully appreciated and protect interior furnishings from harmful UV rays and inevitable fading.

The facts on effective glazing

The correct selection and installation of energy efficient glazing in windows, can reduce heat loss by up to 70 percent.

An unprotected single pane of ordinary glass loses almost ten times more heat than the same area of insulated wall.

If all Australian homes were glazed correctly, Greenhouse Gas Emissions would be reduced by approximately 8 million tonnes per annum.

A significant saving of 40 percent off energy bills to heat and cool all residential and commercial buildings can be made if appropriate glazing is installed.

Installing energy efficient glazing into windows adds as little as one percent to the initial cost of building. The many advantages including the increased levels of comfort, consuming less energy and the significant savings on energy bills are realised for the lifetime of the building.

When taking into account the energy rating or energy consumption of any new home, renovation or commercial building, insulating the window areas should always be considered.

Appropriate energy efficient glazing solutions are readily available for homes in all Australian climatic conditions. The specifications will vary depending on orientation and house design.

When it comes to measuring thermal performance of glass, the lower the U value and the lower the Solar Heat Gain Coefficient (particularly if solar radiation is an issue), the better the thermal efficiency.

Australian Glass and Glazing Association (AGGA)

Who we are:

The Australian Glass and Glazing Association Incorporated (AGGA) is the principal body established to represent the Australian flat glass industry.

Companies that form the membership of the Association include glass merchants and glaziers, window suppliers, local glass manufacturers, agents representing Overseas glass manufacturers, industry suppliers and other interested parties.

For further information on energy efficient glazing contact The Australian Glass & Glazing Association on 1300 138 279

www.agga.org.au

GLASS & GLAZING ASSOC'N
AGGA
OF AUSTRALIA

STAY COOL

STAY COMFORTABLE WITH GLASS

Heat enters easily through ordinary glass. Consider glass energy solutions to build energy efficient buildings in situations where keeping the heat out is important.

When establishing window energy performance, ensure that all energy performance figures are based on NFRC conditions.

STOP UP TO 77% OF SOLAR HEAT GAIN

*by using a high performance Low E double glazed unit in your window.

Select glazing with a SHGC (Solar Heat Gain Coefficient) in the range of 0.4 – 0.2

STOP UP TO 57% OF SOLAR HEAT GAIN

*by using a single glazed high performance tinted Low E glass in your window.

Select glazing with a SHGC (Solar Heat Gain Coefficient) in the range of 0.45 – 0.37

STOP UP TO 40% OF SOLAR HEAT GAIN

*by using single glazed high performance glass in your window.

Select glazing with a SHGC (Solar Heat Gain Coefficient) of 0.52 or lower

(standard 3mm glazing offers little resistance to heat gain)

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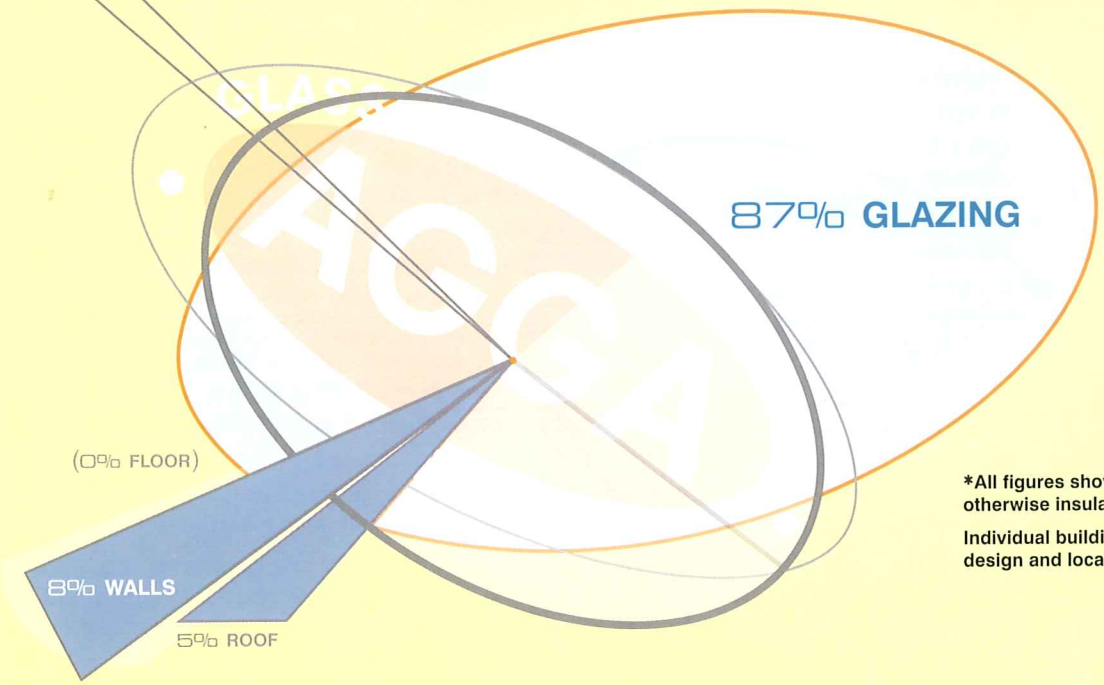
"Glazing is where it all begins. With up to 87% of heat gain and up to 49% of heat loss occuring through the windows, specifying performance glass makes sense."

– Stefan Brey, Arup Facade Engineering

*How buildings gain heat



*All figures shown are based on actual case studies of an otherwise insulated building.

Individual building performance may vary depending upon design and location.

Why windows matter

There is little point in creating a well-insulated building then installing windows with inappropriate glazing.

Windows with ordinary clear glass are the path of least resistance for powerful summer heat. With ordinary glazing, up to 87% of the heat enters a building through the window areas.

Conversely, of the heat lost from a building in cooler climates, (in all climates!) with ordinary glazing, up to 49% is lost through the windows.

As a consequence residential buildings are using 60% more energy to heat and cool than is necessary. †With close to 70% of new homes in Australia now installing air-conditioning, the increased energy consumption and costs to operate these cooling systems is soaring. In all climates the installation of energy efficient glazing will reduce or negate the need to install any artificial cooling systems returning an environmental and economic advantage for the life of the building.

Installation of energy efficient glazing in warmer and tropical climates can reduce the energy cost to cool the building by up to 40 percent.

Developments in building technology and the increased use of glass in contemporary architecture, mean it is more important than ever to carefully consider your choice of glazing when building or renovating.

A wall of windows to let an abundance of natural light into residential and commercial buildings, to integrate the indoor and outdoor areas, and to create a healthier and improved environment is a popular choice for homeowners, builders and architects.

East and west facing windows will receive the largest amount of summer sun, and so the installation of energy efficient glazing will add enormously to the improved level of comfort, reducing significantly the summer heat gain.

Effective use of energy efficient glass allows for the creation of buildings with exemplary design that also work for the environment by minimising heat loss and heat gain, and save you money.

†*Ministerial Council on Energy, June 2004*

Energy efficient glass in windows can achieve:

- **An energy efficient building envelope**
- **Greater design freedom**
- **Greatly reduced greenhouse gas emissions**
- **Minimal reliance on orientation**
- **Enhanced thermal comfort up to 5°C warmer in winter and 10°C cooler in summer**
- **Improved security**
- **A substantial reduction in condensation with the installation of double glazing**
- **Improved acoustic performance**
- **Reduced energy costs to heat and cool, a saving of approximately 40% to heat and cool the building**
- **Reduced fading of furniture and fittings**
- **A better environment for the future**

Glazing Glossary

Coated
Glass may be coated 'on-line' or 'off-line' (independent of the manufacturing process). On-line coatings are called 'pyrolytic' and, because of their high durability, can be further processed (cut, toughened, curved etc). Off-line coated products are often referred to as 'sputtered' coatings and some of these coatings need to be protected within a double glazed unit or a laminate. Once manufactured, off-line coated products are generally not suitable for further processing other than cutting.

Double Glazed Unit or Insulated Glass Unit (IGU)
Two panes of glass separated by a cavity containing air (or other gas) and hermetically sealed.
An IGU provides thermal insulation and improved acoustic performance.
An IGU is described in terms of the thickness of the outer pane in millimetres, followed by the gap width between the panes and finally the thinckness of the internal pane; (e.g. 4/12/4). The greater the gap width (towards about 20mm) the better insulation performance. The inclusion of an inert gas such as argon instead of air and the specification of Low E glass further improves the insulation provided by the IGU.

Laminated
Panes are assembled from two sheets of glass sandwiching an interlayer. Heavy impact can break laminated glass, but won't splinter it leading to greater safety and security. Eliminates nearly 99% of harmful UV rays, which can add to fading to floors and furniture. Specialised interlayer in laminated glass can further reduce Solar Heat Gain Coefficient.

Interlayer: Material used in laminated glass to bond the glass. It is usually PVB.

Light transmittance, Visible Transmittance (VT)
The proportion of the visible spectrum that is transmitted through the glass.

Low E
A coating that is deposited on a glass surface to enable it to reflect short wave (direct solar) heat or long wave (re-radiated/reflected) heat.

Reflective Coating
A metallic coating is applied to one side of the glass in order to significantly increase the amount of reflected visible and infra red heat.

Solar Control Glass
Glass that reduces heat gain derived from direct solar radiation. This may be achieved via interlayers, body tints, reflective coatings or Low E coatings.

Solar Heat Gain Coefficient (SHGC)
The ratio of solar heat admitted by the glazing into a building, compared with the energy striking the outside surface of the glazing. Includes directly transmitted radiation plus indirect heat gain from re-radiaton and convection of absorbed heat from the glass into the building. N.B. The lower the number, the higher the performance.

Toned/Tinted
Usually green, grey, bronze or blue, can shade internal areas and reduce the amount of heat entering through the window. This will keep the building cooler and reduce glare and UV rays.

U Value
The U Value indicates the rate of heat flow through a window, due to a temperature difference, from inside to outside (in winter) or from outside to inside (in summer). Heat is lost and gained through a window by the combined effects of conduction, convection and radiation. The lower the number, the higher the thermal performance.

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