AGGA ENERGY FACT SHEET

A SIMPLE GUIDE TO SUSTAINABLE WINDOWS

Mixed Climate Zones 4 & 5

Areas included in these climate zones are Sydney, Perth and Adelaide

ABOUT SWA PROJECT

The Australian Window Association (AWA) and the Australian Glass and Glazing Association (AGGA), are developing an industry-wide strategy to deliver more sustainable residential buildings through energy-efficient windows and doors. The SWA project has run over 4000 simulations in all 8 BCA climate zones in 3 house types with a wide range of windows to show the impact of high performance windows on the energy efficiency or star rating of the home. All results have been peer reviewed by a panel of Australian and international scientists.

ABOUT THE HOUSES

Houses were specified with R2.0 wall insulation plus reflective foil laminate (RFL) and R5.0 ceiling insulation.

Although the insulation is in excess of the current BCA, these insulation levels were implemented so that non-window heat transfer would be minimised, thus accentuating the sensitivity of the houses to window performance.

The results would not be credible if the houses were underinsulated to start with. Except where noted all houses had concrete slab-on-ground floors, brick veneer external walls and plasterboard internal partitions. It is well known that, for a given house, its annual energy performance for heating and cooling depends on its orientation. To account for this, each house was simulated four times with the house rotated progressively around the four cardinal directions. This yielded an average performance.

ABOUT ENERGY EFFICIENCY

Choosing energy efficient windows will make your home more comfortable, dramatically reduce your energy costs and help to create a brighter, cleaner and healthier environment.

Windows are possibly the most complex and interesting elements in the fabric of our homes. They provide light and fresh air and offer views that connect our interior living spaces with the great outdoors. However, windows can represent a major source of unwanted heat gain in summer and significant heat loss in winter.

Windows can severely impact the heating and cooling loads of a building. Between 46%-61% of a home's heating energy can be lost and between 79%-86% of its heat gained through windows. Improving their thermal performance increases comfort and reduces energy costs and Australia's greenhouse gas emissions.

What Windows Do I Choose?

Window Types

- Aluminium
- Aluminium Thermally Broken
- Timber
- uPVC
- Fibreglass
- Composite

What Glass Do I Choose?

Glass Types

- Tint
- Tint + Clear Low E
- Tint + Clear IGU
- Tint + Clear IGU Low E

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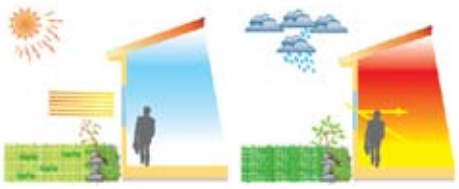
Considerations	Balance the benefits of solar heat gain in winter against keeping cool in summer. Use mid-range solar control Reduce heat flowing through windows (in & out) over course of year
Preferred U-Value	Low
Preferred SHGCw	Mid Range (or ideally tuned by elevation)
Other Factors	"Season-specific" physical shading of windows (e.g. eaves over Northern-facing windows) Windows with adequate openable area for ventilation**ar**
Star Impact	SHGCw optimised (clear to toned) – approximately 0 to 0.5 stars U-Value – approximately 0.33 stars for each unit reduction in U-Value Ventilation – little impact beyond the average of 20% openable area
Heating/Cooling Impact	Each star corresponds to reduction in heating/cooling requirements of approximately 20% to 30% on pre-improved level Star uplift due to reducing SHGCw reduces cooling load but may increase heating load in cooler months In general U-Value improvements act to reduce heat and cooling loads
Cost and GHG Savings	Approximately 3,000MJ of energy saved per star, mostly cooling – worth about $250/year and up to 0.4t of GHG. (Based on Sydney/Perth/Adelaide, 240m^2 house)

Notes:
1. This information is a guide only.
2. For more specific information refer to your window or glass supplier or the WERS Website (www.wers.net)
3. For window selection, Australian Building Code requirements and energy raters will specify actual U-Values and SHGCw for BCA-DTS or simulation tools such as AccuRate, FirstRate 5 or BERS Pro.

U-Value (Uw) measures how readily a window conducts heat. It is a measure of the rate of non-solar heat loss or gain through the assembly. The rate of heat flow is indicated in the terms of the U-Value of a window assembly which includes the effect of the frame, glass, seals and any spacers. The lower the U-Value, the greater a window's resistance to heat flow and the better its insulating value.



A low U-Value is ideal for all climates as it stops unwanted heat gain in summer and unwanted heat loss in winter.

Solar Heat Gain Coefficient (SHGCw) measures how readily heat caused by sunlight flows through a window. The SHGCw is the fraction of incident solar radiation admitted through a window, both directly transmitted, and absorbed and subsequently released inward.

SHGCw is expressed as a decimal between 0 and 1. The lower a window's SHGCw, the less solar heat it transmits.

In cooler climates, a high SHGCw (as illustrated) is beneficial for north facing windows during winter, however shading will be required in summer to prevent unwanted solar heat gain. In hot climates, a low SHGCw is always ideal.

Visible transmittance (Tvw) measures how much light comes in through a window. It is an optical property that indicates the amount of visible light transmitted.

Tvw is expressed as a decimal between 0 and 1. The higher the number, the more light is transmitted.

Ideal for all climates, a high Tvw maximises natural light.

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