

GUEST FEATURE

High-performance glass key to green homes

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Glazed areas in contemporary housing are increasing, and windows and doors are becoming larger and more inventive in their design – but with so many different types of glass and glazing products on the market, how can you make sure your selections are right for your building and its climate?

Modern glass products offer opportunities to achieve so much in terms of energy efficiency, comfort, amenity and safety but Australians have been slow to grasp the benefits of using modern, high-performance glass in windows, doors, walls and other fittings around the home.

While glass makes up only about eight per cent of an average building envelope, we lose about 60 per cent of our heating energy through ordinary windows in winter, and in summer we gain about 91 per cent of unwanted heat through such windows. Sadly, there is still an abundance of old-fashioned, poor-performing windows, (i.e. standard, single-pane glass) in the nation's homes

contributing to escalating energy infrastructure overloads, higher energy bills and sorely compromised comfort levels. The good news is that modern 'high-performance' glass and glazing products can dramatically overturn these deficiencies, which is why it is so important to choose the right glass and glazing: the energy efficiency and basic comfort of a home depend on it.

In an effort to provide information to the building sector and its partner industries, the Australian Glass and Glazing Association (AGAA) has teamed with the Australian Window Association (AWA) to form the Sustainable Windows Alliance, or SWA, to educate building professionals and their customers on the merits of high-performance glass.

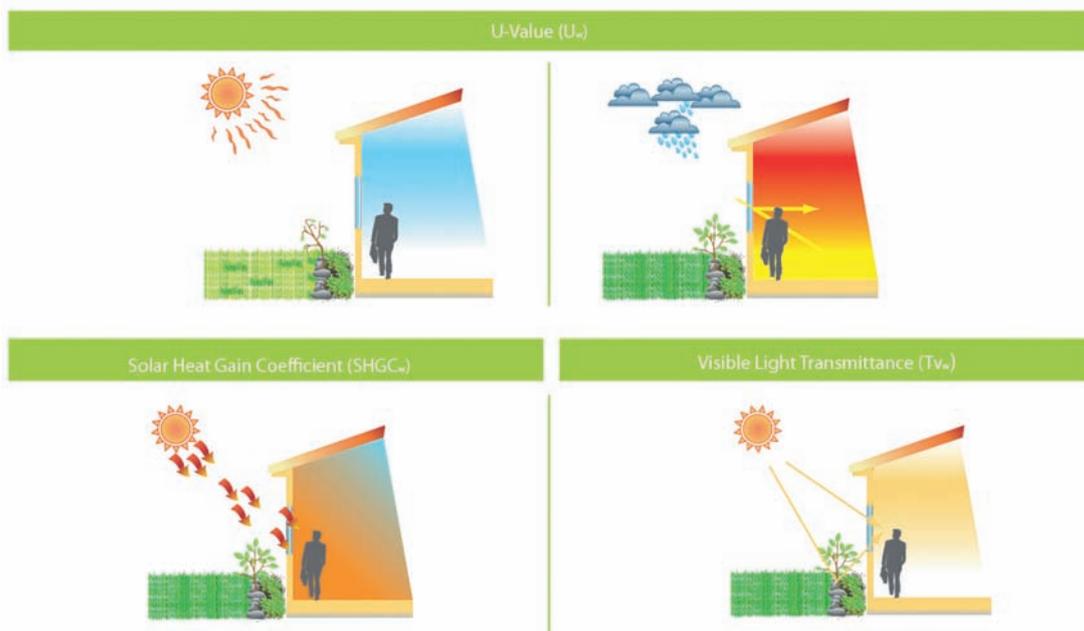
According to Nigel Carpenter, AGGA's Executive Director, only about five per cent of Australia's homes are fitted with high-performance, energy-efficient glass – a state of affairs that must be addressed urgently.

"Our mission is to provide an open door to all industry professionals, from glass and glazing manufacturers and suppliers to builders and architects, to help them understand why high-performance glass and glazing products are the only option for long-term, healthy, sustainable building growth," he says.

The AGGA website (www.agga.org.au) can assist building professionals with information about compliant glazing solutions for their local area, as well as providing a resource on skilled, accredited installers that offer fully compliant product.

"Only deal with local, reputable companies with industry accreditation and membership, which is the best way to make sure products are indeed compliant with Australian Standards and will perform as labeled," Nigel says.

Contemporary architectural glass and glazing systems are subject to very vigorous research and development, so performance benchmarks have become



GLASS AND GLAZING FOR THE VICTORIAN CLIMATE

Most of Victoria is classified as a cold climate zone. In general, glass and glazing systems in cold zones are designed to maximise heat retention in winter, with some consideration devoted to the harnessing of (managed) passive solar heat gain. Shading in summer may be required, even in cold zones, as Australian summers can be intense throughout the country. In general, cool climates call for glass and glazing systems with a high Solar Heat Gain Coefficient (SHGCw), with suitable shading in summer; as well as a low U-value for premium insulation characteristics. Low-e glass is desirable to help reflect internal heat back into rooms. IGUs (Insulated Glazing Units), or double glazed systems, are particularly valuable in cold climates.

Main Issues	Reduce heat passing through windows. Harness solar heat gain in coldest months.
Preferred U-value	Low.
Preferred SHGCw	High (tuned according to elevation).
Other considerations	Allow for strategic shading in summer months.
Star rating impact	SHGCw optimised (clear): No improvement in Star ratings. U-value: Potential improvement of 0.3 Stars for each unit reduction in U-value. Ventilation: Little or no Star rating impact.
Heating/Cooling impact	Each Star corresponds to a 20 to 30 per cent reduction in heating/cooling requirements. Improved U-values reduce heating load all year, although they may marginally increase cooling requirements in hot weather.
Cost and GHG savings	Approximately 10,000 to 15,000MJ of energy saved per Star, mostly heating – worth about *\$300pa and approximately 1.0t of GHG. (Based on Melbourne/Hobart, 240m ² house.) Cost savings are based on 2010 energy costs when the research was undertaken.
Window Options	Aluminium, Aluminium thermally broken, Timber, uPVC, Fibreglass, Composite.
Glass Options	Clear Low-e, Clear IGU, Clear IGU Low-e.



Glass expert: Nigel Carpenter, Executive Director of the Australian Glass and Glazing Association.

and glazing systems designed to suit the varied climates of Australia.

Australia has defined hot, mixed and cold climate zones. Each zone calls for glass with different characteristics and qualities, though, of course, unusual orientations, sloping terrains, etc., may require atypical solutions.

Common sense indicates that in hot climates it is desirable to minimise unwanted solar heat gain and preserve air-conditioned cool air inside; while in cold climates we are likely to be more concerned about retaining internal heat – some solar heat gain (properly managed) may even be a good thing. The main point is that a glass and glazing solution is always available to suit a specific home, location and climate.

It's also important to note that in all climates, performance glazing systems work to bounce the heat back to the original source, keeping the heat indoors in winter and heat outdoors in summer months.

www.agga.org.au

The information provided is current at the time of print, and intended as a general guide. The AGGA recommends that you undertake your own investigations when specifying windows and glass products to ensure they comply with all relevant regulations and are fit for purpose.

NOTE: Nigel Carpenter has recently stepped down from his position as Executive Director at AGGA.



more specialised in recent years in line with our ability to do more with glass.

As glass panels have increased in size, and framing systems have evolved to accommodate greater surface areas, the value of glass as a building material has become more fundamental – as have the responsibilities of specifiers to make sure the best systems are chosen.

Phil Alviano, Sustainable Building Adviser at the Master Builders Association of Victoria, says the elemental status of glass makes the use of high-performance products all the more vital.

“The difference between standard glass and some of the more thermally efficient, high-performance products is truly staggering,” Phil says.

“While strict building regulations address the need for high-quality product in new homes and extensions, we must do everything we can to encourage the rollout of high-performance retrofits in older homes for obvious environmental reasons.”

Be prescriptive

The first thing to note is that there are now generic and specific glass types