



Windows

Windows have a major impact on energy efficiency in the home. A square metre of glass in direct sun can allow as much heat in as a small single bar radiator. Heat loss from a window can be ten times the loss through the same area of insulated wall.

Choosing energy-efficient windows, positioning them well and shading them is a cost-effective investment that will keep your home comfortable, quiet and economical all year round. Savings on energy bills can quickly repay an initial extra investment in energy-efficient windows. In fact, a well-designed passive home with energy efficient windows can require no heating or cooling.

Choice of window frames and glazing is important for good passive design in new dwellings or if retro-fitting windows in existing homes. Careful consideration of passive heating and cooling, orientation, shading, insulation and thermal mass are also vital.

What works best in Tasmania's cool temperate climate?

Regulating heat losses and gains through windows is dependant on a combination of factors: the type of glass; type of frame holding the glass; whether single, double or even triple glazed; how best to use drapes, blinds and shutters; and the use of shading.

Glass

There are many types of glass to choose from. In Tasmania where we need to maximise the transmission of solar energy into our homes in winter and reduce the amount of energy escaping through our windows it seems that low-emissivity glass (e-glass) is most likely to be effective.

Single, double or triple glazing

The current trend in Europe and the colder countries is to install triple glazing, but this is considered to be overkill in Tasmania. Here, double glazing can still make a considerable saving, reducing heat loss from windows by up to 60%. Comfort Plus glass

is also available which is cheaper (though less effective) than double glazing and gives significant protection against heat loss compared to single glazing. E-glass on the internal layer, is another option, which can further reduce heat loss.

In June 2008, one local supplier gave the following quote for an aluminium sliding window measuring 2m x 2.4m: single glazing approx \$950, Comfort Plus coating \$1300, double glazed \$1550 and double glazed using e-glass on the internal panel \$1950.

Frames

After glazing, frames have the greatest impact on window energy performance. Frames are usually made from aluminium, wood or plastic. Timber is a good insulator but the down side is that they require maintenance. If the timber shrinks or swells this can result in gaps unless special draught sealing is provided. Cedar frames require less maintenance and are often chosen for their aesthetic qualities. Wood frames faced with plastic or aluminium offer lower maintenance and higher insulation. Aluminium frames conduct cold air in winter and heat in summer. The impact of this varies depending on the size of the windows. Conductivity is reduced when a thermal break is placed between the internal and external components.

Drapes blinds and shutters

Whilst double glazing will more than pay for itself over time, the initial cost is a consideration. Other forms of insulation can be used either alone or in conjunction with double glazing. Well-fitted, closely woven curtains with reflective metal backings, topped with closed pelmets, create a still space between the glass and the curtain and decrease heat loss. Roman blinds and insulated shutters are also effective as long as they create a good sealed air space next to the window. Shutters can be made of any insulating material, e.g. polystyrene or wood, and can be hinged, pivoted, sliding or fixed into a rebate to be

removed when not in use. Single glazed windows can also be converted into a type of double glazing. Clear Comfort produces a transparent, impermeable membrane secured to the window frame using transparent double-sided tape. This product has a five-star rating from the Nationwide House Energy Rating Scheme (NatHERS). Magicseal also offer a secondary glazing product in the form of a magnetic seal which reduces heat loss, condensation and noise. For suppliers and more information on NatHERS and Window Energy Rating Scheme (WERS), see Further Information, below.

Heat loss relative to single glazing

Bare window, single glazed	100%
Vertical or ventian blinds	100%
Holland blinds, no pelmet	92%
Heavy lined drapes, no pelmet	87%
Double glazing	69%
Heavy lined drapes, with pelmet	63%
Double glazing with low e-coating	57%
Polystyrene shutters, good air seal	50%
Double glazing, heavy drapes and pelmets	47%

Windows as solar collectors

To maximise heat gain through windows in Tasmania, it is recommended that 85% of windows be north-facing. Ideally, positioning of windows should be considered in the initial design of the house, when orientation is under discussion (see separate Sustainable Living Guide on Passive Solar Design). Successful storage of this solar heat depends on thermal mass within the building. Where passive design principles are compromised because of site or design restrictions or the house is already in existence, efficient windows become even more essential for thermal comfort and energy efficiency.

Shading

To avoid gaining solar heat in the summer months, adequate shade is needed. Shade

options may be fixed, such as eaves, or adjustable, such as awnings, shade cloth or pergolas with shading plants. For details of eave sizes, positioning of adjustable shade and plantings see Further Information below.

Further information

Sustainable Living Tasmania Environment Resource Library, 2nd floor, 191 Liverpool Street, Hobart Phone 6234 5566

Solar Kit, Australian and New Zealand Solar Energy Society, Tasmanian Branch, PO Box 121 Sandy Bay (available at SLT Library)

Your Home Technical Manual

<http://www.greenhouse.gov.au/yourhome/>

(also available from SLT bookshop & library)

Hobart City Council www.hobartcity.com.au

Window Energy Rating Scheme:

www.wers.net

Suppliers

Architecture Windows, 17 Lampton Ave, Moonah. Ph (03) 62720088

Clear Comfort, EcoStyle Architecture Suite 5/4 Mathers Lane, Hobart 7000. Ph (03) 6234 6077 www.clearcomfort.com.au

Glass Supplies Pty Ltd, 40 Gormanston Rd, Moonah. Ph (03) 6279 4111 www.glasssupplies.com.au

Magicseal Tasmania. Ph 0408 432 779. Email colhoun@southcom.com.au

Pilkingtons Viridian Glass, 9 Electra Place, Mornington 7018 Ph (03) 6245 0470 & 14 Oldaker St, Devonport 7310 Ph(03) 6424 1816 www.viridianglass.com

Tasman Windows and Joinery, Bldg 1/1086 Cambridge Road, Cambridge. Ph 0419575331

Titane Windows & Doors, 82 Mayne St, Invermay. (03) 63268217 www.titane.com.au

Trimview, PO Box 259, North Hobart 7002 (03) 6231 0249

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