# Double Glazing?

## Time for a new view

If you've lived in the northern hemisphere, where winters are cold and full of snow, you may be familiar with double glazed windows and doors - an almost prerequisite for newer buildings. Here in Australia though, even in areas where temperatures drop into single digits, houses with double glazing are few and far between. Does this mean you should not seriously consider it as an option when building a new house, or replacing your old windows?

### A quick background

Originally thought to have originated in Victorian Scotland, it was not until the 1930's in the US that it became a commercial reality and through the 40's and 50's it was seen as *the* luxury upgrade for new houses; the idea is not new!

A double glazed window (or door) is made up of two panes of glass set into a deep frame and separated by an 'air gap'. This gap of trapped air acts as a passive insulator and can almost double the insulation properties over a standard single pane fitting. More recently, the air gap has been filled with low conductivity gasses, such as argon, which can triple or more the insulation properties over a standard single pane. And while generally uncalled for for most of Australia's climate, in Europe triple, quadruple and even quintuple (five panes) glazing is making t's way into residential construction.

To further increase the thermal properties of the windows, various coatings and or laminations can be applied to the glass (as is also the case with single pane windows), which in turn can add significant increases in performance, depending on the requirements.

## Designed for the cold

Windows account for 25% or more (depending on the type of glass) of thermal loss for a building. It may not sound like a lot but if you are using heating to to keep the interior warm, that means a quarter of your heating bill is quite literally going out the window!

"*A typical single glazed window has a U* value of 5 or 6. Double glazed windows will have U values in a range between about 3.5 and 1.5. The lower the U value the better for reducing winter heat loss.*" (1)

With the rising costs of electricity and gas in Australia, making your house as thermally efficient as possible, especially in the colder months, amounts to long terms savings. For existing houses, where retrofitting insulation into wall cavities may not be possible, replacing windows is a logical choice for increasing your home's thermal efficiency; especially in older houses, where windows often employ thin panes of glass in poorly designed frames.

## Potential beyond the cold

While understandably double glazing originated in colder climes, hence is always seen as a cold climate solution, the benefits for other environments and applications are steadily becoming apparent. So in a country like Australia, where for most cold weather is not that cold and often relatively short in duration, can the additional cost of double glazing be beneficial?

The short answer is yes!

## It's the cool option

"*It is often wrongly assumed that insulated [double] glazing is only for cold climates when in fact it achieves the best performance levels in both U-value and SHGC* in all climates.*" (2)

The ability of double glazed windows to retain heat also works in the opposite direction – that same air gap working at keeping the heat inside, also works to keep the heat out during summer. Additionally, being able to fine tune the window through the selection of different types of glass, not for just a single window but for all, means one can tailor the thermal performance depending window's orientation; maximising thermal insulation for windows that face into the sun, while toning it down for others that face shade.

With summers becoming longer, and hotter, the average Australian household is spending more to keep cool. As with heating, we are all familiar with having run the AC all day and the minute we turn it off it's as if nothing's happened, as our cool air leaks out through all the uninsulated points of our house. Double glazing not only offers the benefit of increased comfort and savings in winter but also for what are becoming longer summers.

## The trifecta - Keeping quiet

While it may seem that it's all about staying warm or keeping cool, double glazing offers a unique characteristic for those living in busy urban environments…

No one likes to live in a sealed box but the realities of urban living means the ambient background noise level can often be quite high. Traffic, neighbours, aircraft, it all adds to the noise pollution that surrounds our everyday lives and while it can be far from an annoyance most of the time, there are times when we simply want to close our windows and enjoy some silence.

Standard single pane windows, especially the traditional 4mm glass found in many older houses and apartments, offer little in the way of sound protection. High performance single pane glass does offer increased insulation, but an appropriately designed double glazed window can offer *substantial* acoustic insulation.

The below table demonstrated the percentage of noise 'removed' based on the pane/gap combinations:

* 19%: 4mm/12mm gap/4mm (voice level reduction)
* 34%: 10mm/12mm gap/6mm (voice level reduction)
* 46%: 10mm/12mm gap/6.38mm laminated glass (traffic level reduction)
* 57%: 6mm/100mm gap/4mm (traffic level reduction)

While it should be noted that the larger the air gap, the lower the thermal property, in many parts of Australia the trade off is more than acceptable. In areas of high ambient noise, such as inner city apartments and housing, where window counts can be low, the employ of double glazing to create a quieter environment, while also increasing thermal insulation, is a three in one bonus.

## A clear winner

While it may not have been an area of consideration previously, it's clear that double glazed windows offer a wide range of benefits to home owners all over Australia, regardless of location or climate:

- *Improved cold weather insulation.*
- *Improved hot weather insulation.*
- *Year round energy costs savings.*
- *Improved acoustic insulation.*
- *Ability to tailor the window to the aspect of the wall.*

So when it comes time for you to consider the windows for your new house, or renovation, don't you think it's time to to have a new view?

* In Australian the 'U value' is the unit of measure used to represent heat loss through a window. the lower the number, the more efficient. SHGC on the other hand is the measure used to determine how much solar heat is passed through a window, with 0 being the best rating and 1 the worst.

**Quotes:**

1. http://www.moreland.vic.gov.au/globalassets/areas/esd/factsheet-double-glazing.pdf

2. [Glazing | YourHome](http://yourhome.gov.au/passive-design/glazing)

**References:**

[Glazing | YourHome] (http://yourhome.gov.au/passive-design/glazing)

[BuildingGreen] (https://www.buildinggreen.com)

[How to Reduce Your Home Energy Bills - Centaur Media - Google Books] (https://books.google.com.au/books?id=SJ-nBQAAQBAJ&pg=PA48&dq=double+glazing&hl=en&sa=X&ved=0ahUKEwi0xquvj-3hAhVIX30KHSjHDM8Q6AEITTAH#v=onepage&q=double%20glazing&f=false)

[Key Message - Acoustics - AWA-AGGA Limited] (https://www.awa.org.au/resources/acoustics)

[A Complete Guide to Double Glazed Windows | Red Energy] (https://www.redenergy.com.au/living-energy/smart-homes/a-complete-guide-to-double-glazed-windows)

[Noise Reduction with Double Glazing - hipages.com.au] (https://hipages.com.au/article/noise_reduction_with_double_glazing)