



PITFALLS OF AVOIDING DOUBLE GLAZING

Using double glazing in houses throughout New Zealand is key to following an energy efficient path.

By John Burgess, BRANZ Sustainability Scientist

Double glazing in residential windows has now been introduced into the New Zealand Building Code Clause H1 *Energy efficiency*. For designers to show compliance using the schedule method of NZS 4218: 2004 *Energy efficiency – Small building envelope*, they are now required to use double glazing in all the climate zones of New Zealand.

Because the Building Code is a performance-based rather than a prescriptive code, the use of double glazing cannot be made a mandatory requirement, but its use is recommended as the most cost effective solution to reduce heat loss through windows and the likelihood of condensation forming on the glass.

Designers choosing not to use double glazing will need to prove that the single glazing complies with the Building Code through the calculation method or the modelling method of NZS 4218, or by using the BPI method.

There are some potential pitfalls in choosing to use single glazing that need to be weighted against possible initial cost savings.

Single glazing brings higher costs

Choosing single glazing will result in extra costs for thermal design work and increasing the R-values in other parts of the building. This cost may exceed the additional cost of selecting double glazing instead.

Thermal modelling has also shown that typical housing in all of the New Zealand climate zones benefits from reduced space heating needs when double glazing is used.

Glazing is the weakest link

In a typical house built today, even double glazed windows are still the source of the greatest heat loss from the insulated building. With single glazing, the amount of heat lost through the windows can be 50% of the heat losses. The remaining heat losses are through the walls, floor, roof and air leakage.

Increased lifecycle costing

The purchase cost of double glazing is currently higher than the purchase cost of single glazing. This is likely to remain so, since more materials and time are required to manufacture double glazing. However, single glazing is not the cheapest if the full lifecycle cost is taken into account.



Double glazing is now recommended throughout New Zealand.

Modelling has shown that the cost of maintaining acceptable internal air temperatures for the life of a domestic building with single glazing is much higher than the purchase cost of double glazing. Therefore, when deciding on glazing options it's more important to think about the cost of heating the building during its life, rather than just the cost of the glazing itself. If cooling in summer is required, double glazing is beneficial as well, as it reduces cooling needs.

Market expectations

After a number of years of the higher insulation requirements of the Building Code Clause H1 being in effect, the market will come to expect double glazing as a normal part of housing.

It is possible that sale prices will differentiate between housing with single and double glazing because double glazed houses maintain higher comfort levels.

Higher internal condensation levels

Large amounts of condensation can form on the inside face of single glazing when the outside air temperature is cold. This condensation can cause damage to window furnishings and hardware. Condensation on the inside of window glass can be virtually eliminated in most climate areas in New Zealand if double glazing is used.



Although designers may be tempted to use single glazing sometimes, beware of the extra costs.

Increased summer cooling loads

Double glazing can help prevent heat gain in summer. This is of particular importance when a dwelling has a mechanical space conditioning system, such as a heat pump, and is located in the upper half of the North Island, or in one of the sunnier regions of the country. The amount of purchased heat required to maintain acceptable indoor air temperatures in summer is reduced considerably when double glazing is used.

Global climate change is also predicted to increase the average summer air temperatures over much of the country, and double glazing will be useful to help combat this.

Noise, fading and sun damage

Double glazing lets in less noise than single glazing, resulting in a quieter home. It also reduces UV levels, and thus fading and sun damage to furniture and fittings.

Consider the downsides

The potential pitfalls above may not always eventuate, but they need to be thought about if single, rather than double, glazing is being considered by the designer or client. ■