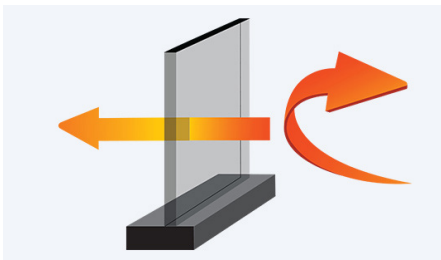




Types of window glazing

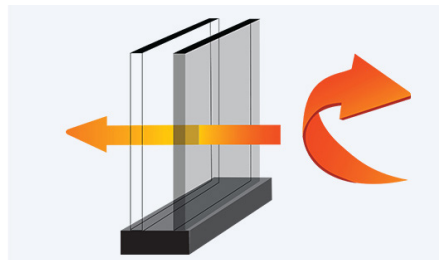
Glazing refers to the layers of glass that are sealed in a frame to make up a window. Traditionally, single glazing, with just one pane of glass in the frame, was used.

Today, double glazing, with two layers of glass – or even triple glazing, with three layers – is increasingly popular because it reduces the amount of heat lost through windows and helps increase the energy efficiency of your home: <https://www.wganz.nz/guides/energy-efficiency>



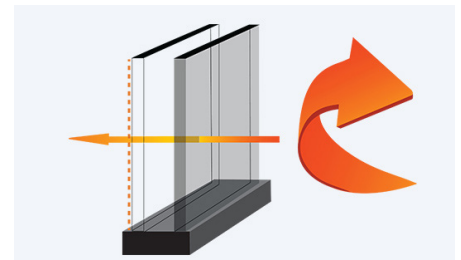
Single glass

A single pane of glass provides very poor insulation because glass is a good conductor of heat. Much of the heat in your room literally goes out the window.



Double glazing

Install double glazing and you have a layer of air trapped between two panes of glass. Because air is a poor conductor of heat, much less heat is lost through the window.



Double glazing – Low E coating

If the inside of one pane has Low E coating, even less heat is lost, because the coating reflects heat back into the room.

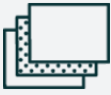
Key Facts



Single, double or triple glazing refers to the number of panes of glass that are sealed in a frame to make up a window.



Double or triple glazing has a layer of insulating air, or other gas, between panes that acts in a similar way to a fibreglass batt in a wall. It reduces heat loss from windows and increases comfort and warmth.



Other benefits of double or triple glazing can include lower energy bills and reduced noise.



A Low E glass coating can further boost the benefits of double or triple glazing.



Thermal performance measures effectiveness of glazing and shows the difference double and triple glazing can make to improving the energy efficiency of your home.

Why choose double or triple glazing?

In double glazing, the air between the two panes of glass acts like an insulating 'blanket' – storing heat and releasing it slowly to help you control the temperature of your home. As the name suggests, triple glazing has three panes of glass, adding an extra insulating layer for additional warmth. It is most often used in colder climates, such as in the South Island.



keeps you warm in winter, cool in summer



reduces energy bills



replaces thermal drapes



reduces noise



reduces condensation
<https://www.wganz.nz/guides/condensation>



requires minimal maintenance



improves security



upgrades and adds value to your home

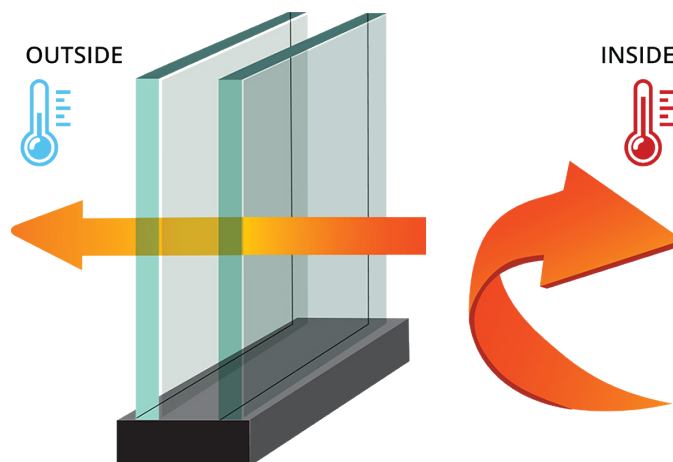
For new builds, double or triple glazing can help you meet the requirements for energy efficiency in line with The New Zealand Building Code requirement for new residential construction. (Internal link to the Energy Efficiency section of this Guide)

How double and triple glazing works

A single pane of glass offers very poor insulation, leading to a lot of heat lost through the glass in winter. Double – or triple – glazing traps air between two (or three) panes of glass, which by comparison to single glazing has twice the heat loss of double glazing.

Heat loss can be further reduced by coating one or more panes with transparent Low Emissivity (Low E) coating, which reflects the heat back into the room.

Thermally efficient window frames also help prevent heat loss and are ideally teamed with double or triple glazing. Other special glass treatments can be used in double or triple glazing for safety, security or fire resistance, or to match your decor.



Thermal performance

Thermal performance measures the effectiveness of glazing in reducing heat loss. This measure is called a U value and can provide a useful guide to the difference double or triple glazing could make in your home.

The higher the U value, the less energy efficient the window is, meaning more heat is lost. The U value of a single-glazed window can be 5 or higher, while a triple-glazed window could have a U value of less than 1.

This chart compares single glazing with double glazing (with and without a Low E coating) and shows just how effective these different forms of insulation can be.

Another useful measure of energy efficiency is our WEERS (Window Energy Efficiency Rating System) which rates the actual energy efficiency of the windows you purchase for your home: <https://www.wganz.nz/guides/energy-efficiency/#weers>

Construction R-values (R_{Window}) of selected generic vertical windows and doors

Type of glazing	$U_g^{(1)}$	Spacer type ⁽²⁾	Example IGU ^{(3), (4)} (informative)	R_{Window} (m ² ·K/W) for different frames			
				Aluminium frame	Thermally broken aluminium frame	uPVC frame	Timber frame
Double pane	2.63	Aluminium	Glass: Clear/Clear Gas: Air	R0.26	R0.32	R0.40	R0.44
	1.90	Aluminium	Glass: Low E_1 /Clear Gas: Argon	R0.30	R0.39	R0.50	R0.56
	1.60	Thermally improved	Glass: Low E_2 /Clear Gas: Argon	R0.33	R0.42	R0.56	R0.63
	1.30	Thermally improved	Glass: Low E_3 /Clear Gas: Argon	R0.35	R0.46	R0.63	R0.71
	1.10	Thermally improved	Glass: Low E_4 /Clear Gas: Argon	R0.37	R0.50	R0.69	R0.77
	0.90	Thermally improved	Glass: Low E_4 /Clear Gas: Krypton	R0.40	R0.54	R0.76	R0.85
Triple pane	1.89	Thermally improved	Glass: Clear/Clear/Clear Gas: Air		R0.38	R0.50	R0.56
	1.20	Thermally improved	Glass: Low E_2 /Clear/Clear Gas: Argon		R0.48	R0.66	R0.74
	1.00	Thermally improved	Glass: Low E_3 /Clear/Clear Gas: Argon		R0.52	R0.73	R0.81
	0.70	Thermally improved	Glass: Low E_3 /Low E_3 / Clear Gas: Argon		R0.59	R0.86	R0.95
	0.60	Thermally improved	Glass: Low E_4 /Low E_4 / Clear Gas: Argon		R0.62	R0.91	R1.01

Notes:

- (1) Thermal transmittance of the glazing determined using BS EN 673. Where the U_g -value of the proposed glazing is different from the values included in the table, R_{Window} shall be determined based on the nearest U_g -value in the table that is greater than the U_g -value of the proposed glazing.
- (2) 'Thermally improved' refers to a spacer that meets the definition of thermally improved spacer in ISO 10077-1 Annex G.
- (3) The examples provided are informative descriptions only of the insulated glazing unit (IGU) types that might be used to deliver the nominated U_g -values. When using this table, R_{Window} shall be determined based on U_g , spacer type and frame type.
- (4) The properties of each of the glass panes within the IGU are provided and separated by '/'. 'Clear' refers to clear float glass. 'Low E_1 ', 'Low E_2 ', 'Low E_3 ' and 'Low E_4 ' refer to glass with low emissivity coatings at different performance levels.

Choosing the right double or triple glazing

For most homes in New Zealand, double glazing will be enough to significantly improve comfort and warmth and increase energy efficiency. Triple glazing is likely to be of most benefit to people in the coldest parts of the country or where noise pollution is an issue.

Life expectancy of Double Glazing

A pane of double (and triple) glazing is referred to as an IGU (Insulating Glass Unit) within the Window & Glass industry.

As with all manufactured products, IGU's have a foreseeable lifespan. When, under normal use conditions, condensation (fogging) occurs within the space between the panes, the unit is deemed to have reached the end of its useful life. IGU's typically carry a 10-year warranty and as the purchaser you will expect your glazing to last longer than the warranty period, but you do not, or should not, believe it will last forever, even if well maintained.

With NZ's diverse climatic conditions, during its life, your IGU is exposed to a range of environmental influences, including temperature and atmospheric pressure fluctuations, wind loads, sunlight / UV light, water, and water vapour and in coastal locations salt laden sea air. In service history both internationally and within in NZ has shown a variety of IGU life expectancies depending not only on these environmental factors, but also on the design of the unit, its installation and how well it is maintained. To ensure the highest probability of a long life for your IGU's, we recommend you use units supplied by a member of the IGUMA (Insulated Glass Unit Manufacturers Association) and installed in accordance with industry guidelines