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GLASS

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# Glass Solutions for Windows & Doors

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CONSUMER GUIDE



# Welcome The Light

Exposure to natural light is considered a major driver in the area of wellbeing.

But letting the light in is not the only role glass plays in a building's framework. The right glass can also help to reduce noise, improve privacy and make your windows safer.

Your glass choice can make a big difference in the overall comfort and general feeling of your home.

Depending on your individual needs there may be a number of glass options right for you.

At FMI Glass, we are passionate about glass as a material, and the importance it plays in finishing a home. We invest in

the latest technology and pride ourselves on our quality and service. We supply fabricators throughout New Zealand with a wide range of glass options to suit our unique climate conditions.

The information contained in this brochure will help you to better understand glass, the options available and how you can use them to make your house a more comfortable home.

We recommend you talk to an expert (your architect, a builder, a local fabricator or glass supplier) to help make your final glass selection.

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# Understanding IGU's (Insulating Glass Units)

In New Zealand, to comply with energy efficiency standards, buildings must meet certain requirements which vary across the country.

For most homes that will mean single glazing may not satisfy the standard, and instead you will need to use insulating glass units (or IGU's).

**IGU (Insulating Glass Unit)**

An insulating glass unit is made up of:

- 2 or more panes of glass (of which there are varying types and thicknesses to choose from)
- Held apart by a spacer: both standard and thermally improved options are available

- The space between the panes of glass is filled with air or an inert gas
- And sealed around the edges.

An IGU can improve the overall comfort of a room by holding heat in (or out) more effectively. The right glass combination within an IGU can also be used to reduce noise, glare, fading and make your windows safer.

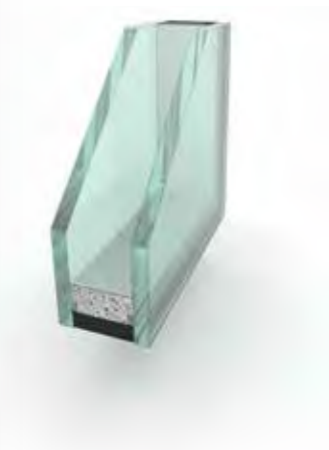
## IGU options

**Double Glazing Unit (DGU):** with 2 panes of glass. These make up the majority of glass solutions in New Zealand.

**Triple Glazing Unit (TGU):** with 3 panes of glass.

**Quad Glazing Unit (QGU):** with 4 panes of glass. These are less common in New Zealand.

Double Glazing Unit



Triple Glazing Unit



# Understanding Thermal Efficiency

The thermal efficiency of construction materials is measured by an R-value.

The higher the R-Value, the less heat is lost through the material and the better the insulation and efficiency will be.

**The R-Value of a specific window is dependent on a number of factors including:**

- The size of the pane of glass in a window (the bigger the glass, the better the window performs)

- The type of glass used, and type of IGU chosen (DGU, TGU)
- The window frame material: standard aluminium frames (over 90% of frames used in New Zealand) or thermally improved options.

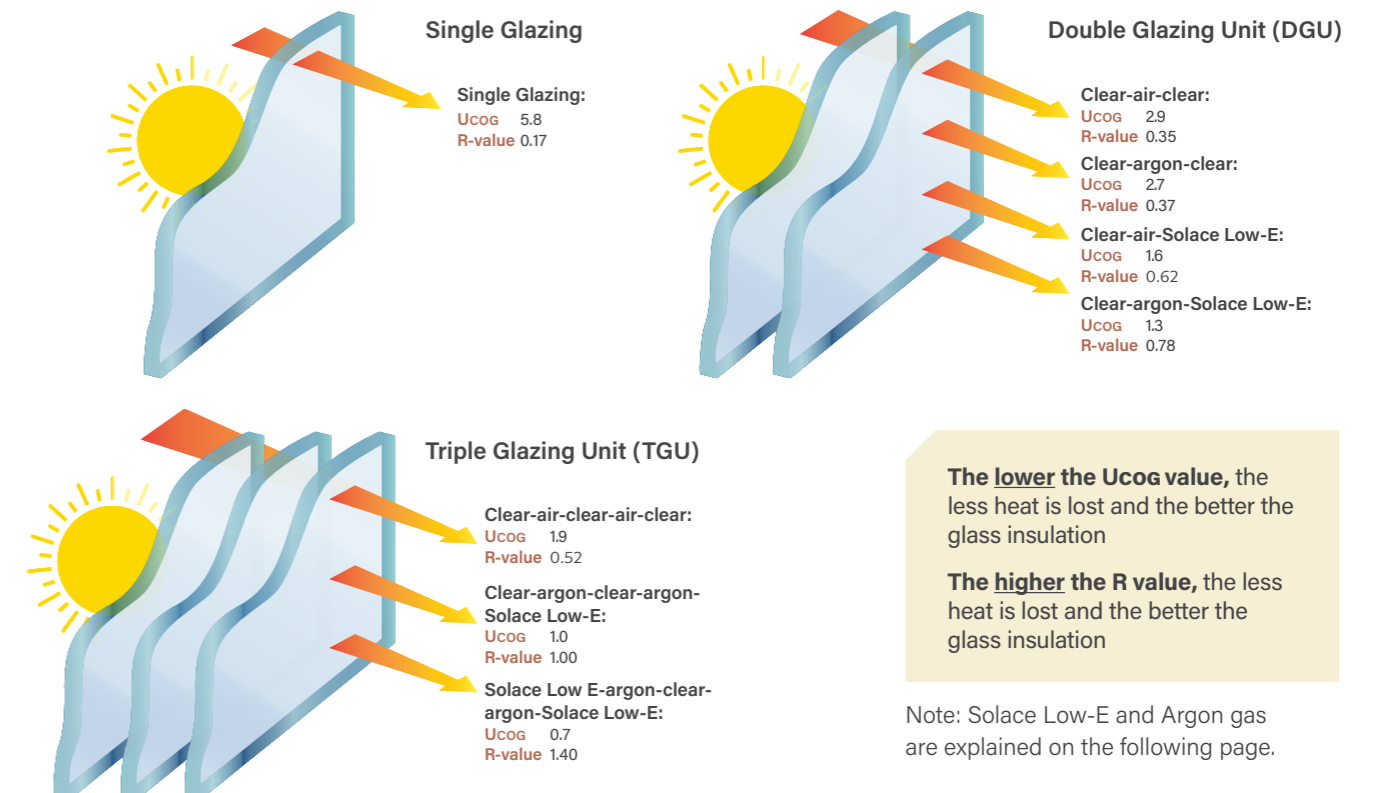
## Measuring glass thermal efficiency

The thermal efficiency of glass alone is usually measured by a U-Value, which can then be converted to a R-Value.

The U-Value is a measure of how much heat energy is lost or gained through the glass. The lower the U-Value the less heat is transferred resulting in better insulation.

The U-Value measurement is taken at the centre of a pane of glass (Centre of Glass, or U<sub>COG</sub>).

The edge of the pane of glass has worse thermal properties than the Centre of Glass due to the interaction between the glass, the spacer and the frame.



**The lower the U<sub>COG</sub> value, the less heat is lost and the better the glass insulation**

**The higher the R value, the less heat is lost and the better the glass insulation**

Note: Solace Low-E and Argon gas are explained on the following page.

## Comfort and Warmth

Your home can feel 'just right' without overspending on heating or cooling, by choosing energy efficient windows and doors.

While it's tricky to quantify exactly how much money can be saved as part of a total window system, quality aluminium frames with insulated glazing can help boost the energy efficiency of your home.

Combined with a higher performance glass solution like Solace Low-E, and then with the addition of argon gas, the benefits continue to get even greater.

### Solace Low-E glass

Solace Low-E is a low emissivity glass. It has an almost invisible coating that covers the inside of a pane of glass within an IGU. This coating lets the sun's light and energy into your home and reflects the heat back indoors, creating a shield against the cold.

In warmer climates changing the positioning of the Low-E coating within the IGU can help keep the heat out.

Some Low-E glass products can look hazy, but Solace Low-E from FMI Glass provides exceptional clarity.

Solace Low-E contributes to a warmer interior surface significantly reducing condensation in your home.

### Argon gas

Argon is a naturally occurring gas that is non-toxic, colourless, and odourless. It is used to increase the energy efficiency and general performance of thermal windows.

Argon gas insulates better because it has a lower thermal conductance than air.

The space within an IGU can be filled with argon gas to slow the transfer of temperature through the window.



# Noise Reduction

Whether it's from traffic or neighbours, we understand that noise can be stressful and irritating in your home.

An Insulating Glass Unit (IGU) using glass panes of different and greater thicknesses is the most cost effective way to reduce general noise in your home.

For homes exposed to more extreme levels of and/or high pitched noises, Acoustic Laminated Glass in an IGU will give you the best noise protection and the most comfort in your home.

The actual level of sound reduction may be affected by factors such as the varying range of noise frequencies in the environment and the size of the window.

## Acoustic Laminated Glass (sound reducing glass)

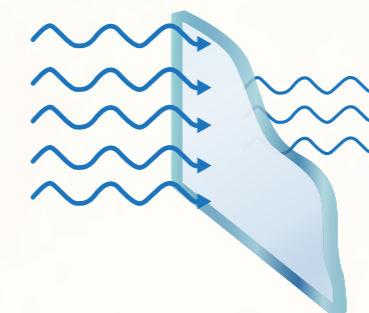
Acoustic Laminated Glass consists of 2 panes of glass laminated together with an acoustic laminated membrane. It appears as a single pane of glass, however the membrane reduces noise by absorbing energy and sound vibrations from travelling through the glass.

A Rw weighting (weighted sound reduction index) provides information on how much (or little) a material will stop or reduce the transmission of sound to the other side. The higher the Rw Rating, the greater the ability to reduce sound transmission.

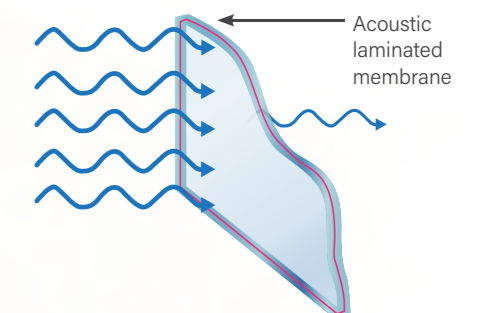
The diagrams below show the effectiveness acoustic laminated glass has in reducing noise.

### Tip

The 3mm/0.76mm Laminate/3mm option is the entry level Laminated Glass offering from FMI Glass. Options range up to 6mm/0.76 Laminate/6mm which delivers an Rw of 40 dB, 50% perceived sound reduction compared to Standard glass.



**Single pane of glass**  
(4mm Standard Glass)  
Rw = 29 dB



**Acoustic laminated glass**  
(3mm/0.76 Laminate/3mm)  
Rw = 36 dB  
(33% perceived sound reduction compared to Standard glass.)

# Fading and Glare

The New Zealand sun brings light and warmth to a home, but it can also fade furnishings, carpets, curtains and artwork.

Tinted glass decreases the amount of UV, visible light and heat that passes through your window, to reduce fading of your precious items.

Tinted glass is made by adding metal oxides during manufacturing. It helps reduce glare from outside and decreases the amount of solar heat that reaches through the glass.

## Tinted Glass

### Grey Tints

Grey tints have low light transmission, reducing solar heat and glare. A house with grey tint windows will feel slightly darker than with clear glass.

### Bronze Tints

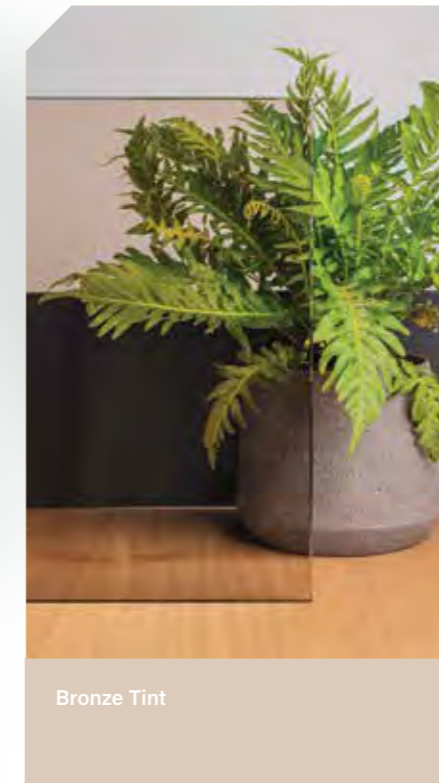
Bronze tints reduce solar heat and glare, and offer more visible light. A house with bronze tinted glass will feel warmer with richer tones and a warm glow to interior décor.

### Green Tints

Green tints offer better solar performance and superior light transmission.



Grey Tint



Bronze Tint



Green Tint



Dark Grey Tint  
(Double Grey)

Note: This is very dark glass and most often used to obscure items eg. above Garage Doors to hide chains.

### Tip

Tinted Laminates are also available. Contact your local fabricator, glass supplier or FMI Glass to check whether they are suitable for your project.

### Dog Doors and Cat Flaps

Dog doors and cat flaps can be cut into most glass, with toughened glass being the best option. Holes should be pre-cut prior to installation. There are various door and flap options available - talk to your local fabricator or glass supplier about the best solution for you.



# Privacy

You may wish to consider the areas of your home where privacy is important

We offer a number of glass options that can provide more privacy to areas such as bathrooms, or windows where you are close to neighbours or roads.

## Opalescent Laminated Glass

Opalescent laminated glass is a popular glass for bathrooms and other spaces needing privacy. Its a safety glass that offers a high level of acoustic performance, plus eliminates 99% of UV. It lets in plenty of light, yet is very obscure. It has the appearance of being sandblasted, but is a smooth glass, making it very easy to clean.



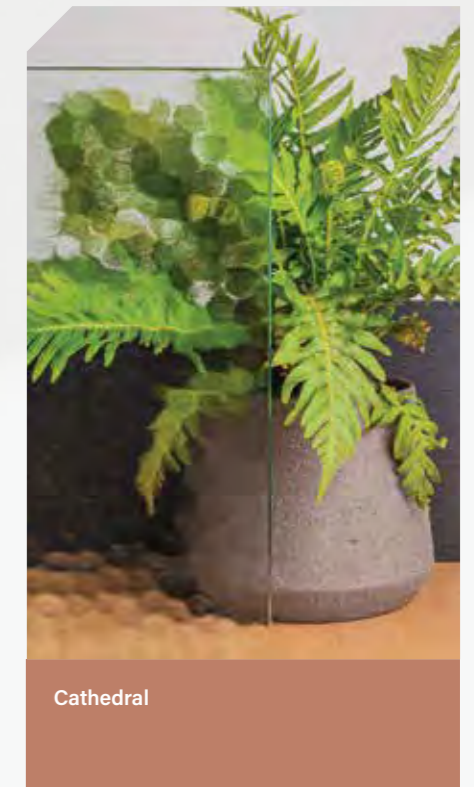
Opalescent



Cotswold



Arctic



Cathedral

## Patterned / Obscure Glass

There are various options of patterned and obscure glass available, offering different levels of opaqueness and therefore privacy. Pictures of the most popular options are shown.

## Tinted Glass

Tinted glass will provide more privacy than clear glass. Refer to Glass for Fading and Glare section for more information.



Stippolite



Etchlite



Mistlite

### Tip

Before making your final selection, make sure you check whether the glass will provide the same level of privacy in daytime and night time when internal lights are on.

# Safety and Security

For the safety of your family, you may need safety glass in some areas of your home.

The Building Standards require safety glass to be used when the lowest point of the glass is within 800mm of floor level. Safety glass is often also required in locations subject to human impact (eg. wet areas) or to safeguard against falls (eg. second stories).

Safety glass encompasses features that make your glass less likely to break, or help it to break in a less dangerous way; keeping your family safe.

There are 3 types of safety glass to choose from: toughened, laminated and toughened laminated.



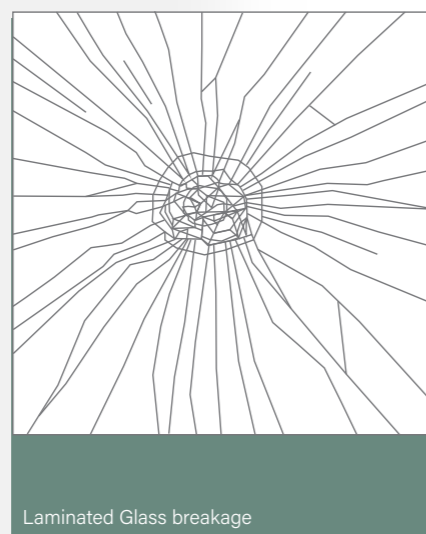
## Toughened Glass

Toughened safety glass has undergone heat treatment to make it stronger overall (in fact, toughened glass is over 5 times stronger than regular glass). If toughened glass does break, it breaks into small pieces, reducing the risk of injury.



## Laminated Glass

Laminated safety glass is made by applying a plastic interlayer between two (or more) panes of glass. It's much harder to break through and won't shatter like normal glass. Instead it 'spiderwebs' from the centre because the interlayer holds it all in place.



## Toughened Laminated Glass

Toughened laminated glass uses toughened glass with the plastic interlayer. If this glass does break, it will be into small, blunt pieces and held in place with the laminate layer.



# Narrowing Down Your Choices

## Your glass options

Choosing the right glass for your home is a far more technical and involved decision than many of us initially think.

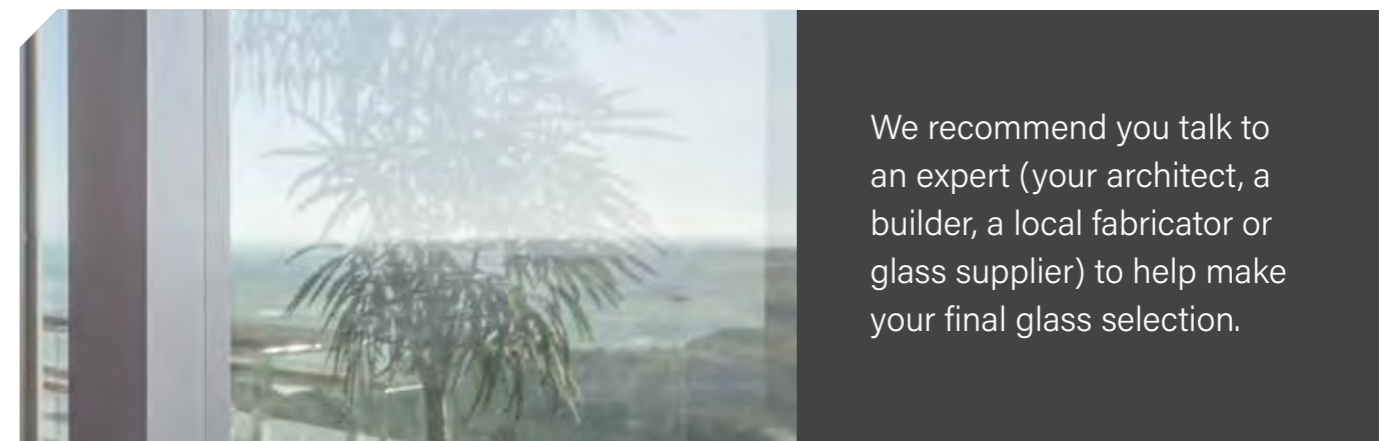
The table below summarises the glass options included in this brochure.

Please note: Solace Low-E, Tinted Glass and most Patterned or Opaque Glass options can also be toughened or laminated, enabling you to get multiple benefits from your glass choice.

Different panes of glass can be used within a DGU to provide multiple benefits. For instance, Solace Low-E on one, and toughened or tinted glass on another.

Benefits	Solace Low-E Glass	Toughened Glass	Laminated Safety Glass	Laminated Acoustic Glass	Tinted Glass	Patterned / Opaque Glass
A warmer home	■					
A cooler home in summer	■				■	
Minimise condensation	■					
Less noise			■	■		
Reduce fading of furnishings & artwork	■		■	■		
Reduce Glare					■	
Keep your family safe		■	■	■		
More privacy					■*	■

\* Tinted windows only provide privacy during the day, not at night when internal lights are switched on.





CONTACT US.

