

Choosing frame materials

External glazed windows and doors need a frame that is durable, strong and weather-tight. Timber, aluminium, and uPVC are among our mostly commonly used framing materials, and each has its pros and cons.

Aluminium



Light and durable, aluminium is a popular choice for framing in both residential and commercial buildings. Frames are typically factory-assembled to order, and used in retrofits or new builds. Aluminium doesn't require regular repainting, so it needs less cleaning and maintenance than timber frames, which helps reduce its overall cost over a lifetime. The metal is also reusable and endlessly recyclable.

Anodising and powdercoating



The natural colour of anodised aluminium is silver, but by adding three more processing steps a wide range of shades can be achieved. In window joinery, the range typically starts off with a very pale bronze (champagne), and deepens through to medium and dark bronze, and on to black.

Anodic treatment can sometimes highlight naturally occurring grain in the surface of the aluminium, not unlike timber or stone. This grain affects the way the surface refracts light and can lead to minor differences in the brightness of different components of your joinery. However, these won't affect the performance or durability of the joinery itself. Because anodising colour-processing varies, not all colours will match up from one supplier to another.

The natural beauty and lustre of anodised aluminium can be maintained for at least 20 years with proper maintenance. Read more about maintenance [here](#).

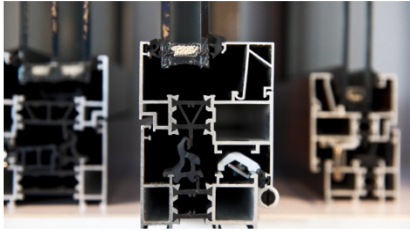
Powdercoating is applied to the surface of the metal, like a paint (unlike anodising, which changes the base metal itself). Finely ground particles of pigment and resin are electrostatically charged and sprayed onto the joinery sections. These sections are then baked in an oven until the powder is fully cured. The result is a sleek, strong, high-quality finish that is one of the most durable colour coatings available for aluminium window and door frames.

A good powdercoated finish will have a uniform appearance, colour, texture and gloss, and be free of any visible defects. Powdercoatings come in a range of colours and do not require regular repainting. However, to prolong its life, treat your powdercoated joinery with the same care and attention you would give to the paintwork on a new car. (Read more about maintenance [here](#).)

It's worth noting, too, that New Zealand's harsh weather and UV conditions are hard on even the most durable finishes, and some powdercoating colours will perform better, and give you a longer life, than others.

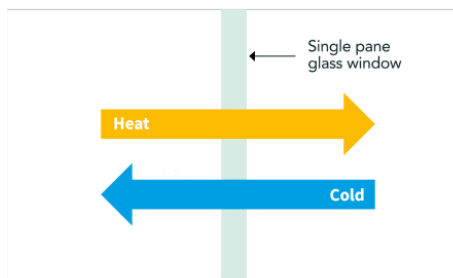
Pale colours and pastels will last well over the long term as they reflect heat and have the best UV performance. Darker colours, such as grey and black, absorb heat and will age more quickly than pastels, although regular maintenance will help increase their longevity. Bright reds, yellows and oranges are produced using synthetic orange pigments and will fade over time, so are best avoided.

Thermal breaks

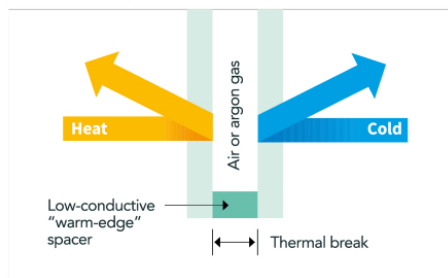


Like most metals, aluminium conducts heat and cold efficiently, so by itself it is not a good insulator. Accordingly, aluminium frames now contain thermal breaks. These are plastic elements 'sandwiched' between the metal parts, where they interrupt the conduction of heat or cold. As insulators, they perform a similar function to the air (or gas) inside a double-glazed unit.

Single Pane Glass



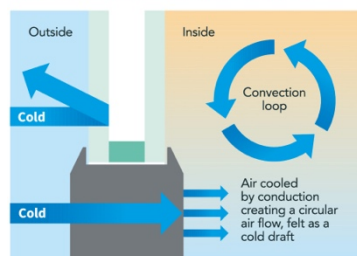
Double Glazing



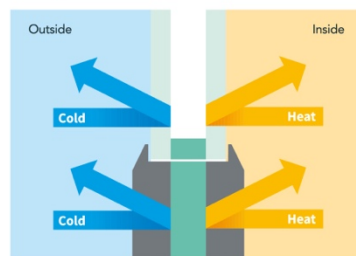
Thermal breaks offer several benefits: they keep your house cooler in summer and warmer in winter; they save on energy consumption; and they reduce condensation.

Temperature regulation: In winter the interior surfaces of a traditional aluminium frame will be similar to the temperature outside. When the warm air in a room meets the cold frame it creates a convection loop that circulates cold air in the room, which feels like a draft. With a thermally broken window, the frame interior is not as cold, so the convection effect is greatly reduced.

Cold Day
(double glazing / traditional aluminium frame)



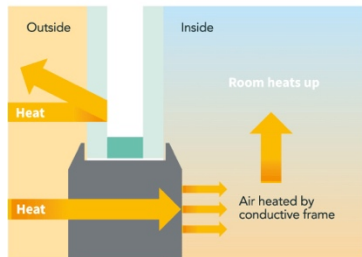
Cold Day with Thermally Broken Windows



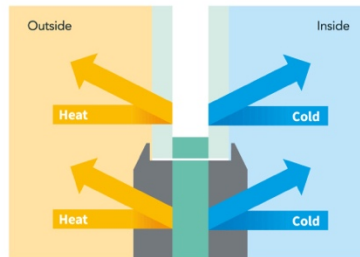
Thermally broken frames are effective whatever the weather. On a hot day, they inhibit heat transfer from outside in, helping to keep rooms pleasantly cool. On a cold day, they keep your valuable home heat

energy from 'leaking' outdoors. You can feel this at work if you touch your aluminium frames: on a cold day, they should not feel cold.

Hot Day
(double glazing / traditional aluminium frame)

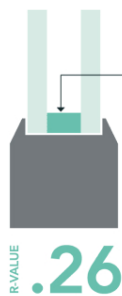


Hot Day
(double glazing / thermally broken windows)

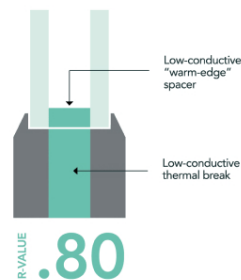


Reducing energy consumption: A window's thermal performance is measured in R value, with a higher number representing better insulating properties. A traditional aluminium window frame with double glazing has an R value of 0.26. With a thermally broken window frame, an R value of up to 0.8 can be achieved; upgrading that window to triple glazing can result in an R value of 1.0. A thermally broken frame therefore conserves heat energy and helps reduce your bills.

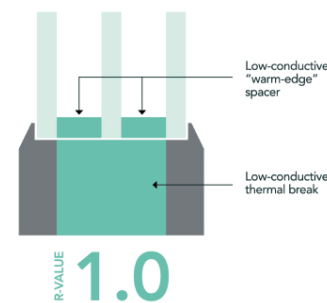
Double glazing
with traditional
aluminium frame



Double glazing with
thermally broken frame

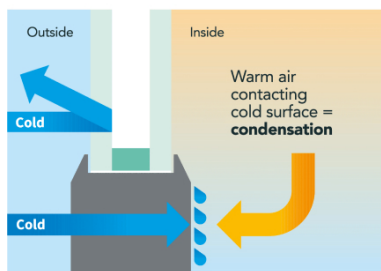


Triple glazing with thermally
broken frame

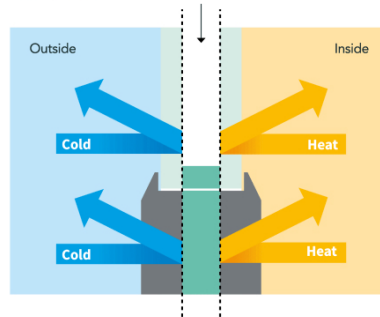


Reducing condensation: Condensation occurs when warm moist air comes into contact with a cold surface. Because the interior face of a thermally broken window frame stays at a similar temperature to the interior of the room, there's much less risk of condensation occurring. (Note that in addition to thermally broken window frames, you will need to ensure adequate heating and ventilation to ensure frame temperatures do not fall below the dew point temperature.)

Condensation
(double glazing / traditional aluminium frame)



Thermally Broken Window / no Condensation
Thermal break prevents warm air contacting
a cold surface



Double-glazed windows are only truly efficient when used in conjunction with thermally broken frames. When you invest in double glazing, reputable fabricators [F1] will include thermally broken frames as standard. And, by definition, a 'thermally broken window' is one that features both double-glazed panes and thermally broken frames.[F1]WGANZ can we firm this up? Can we say, e.g., that if you're buying DG, your supplier will always include thermally broken frames? Or is this something the consumer should check with the supplier?

Timber

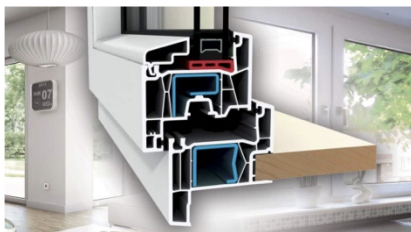


The traditional choice for pre-1970s homes in New Zealand, timber is aesthetically pleasing and can be painted or stained in any colour. Internal reveals – the parts of the frame on the interior of the window or door – are also typically made of wood, even on window frames of other materials. Native softwoods were generally used in early New Zealand homes, with more exotic options appearing in later decades.

A considered choice

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uPVC



uPVC is commonly used throughout Europe and North America for window frames in residential housing. At this time, some uPVC window sections are imported and bring their overseas design influences, including functions and features not usually available with traditional New Zealand

product[F1] . Some of these influences must be considered when integrating into local building design and construction methodologies. Whilst some manufacturers can provide a range of colours and/or external finishes, uPVC windows and doors are most commonly white in colour.

Steel



Steel window frames offer a durable and versatile solution for all types of buildings. Renowned for its strength and fine sightlines, steel is a premium framing material often used in architecturally designed residential homes but is equally suited to commercial projects too. Steel is often favoured for its visual appeal, especially in modern and contemporary designs, and can also provide enhanced security and fire resistance, where applications may require it.

Steel offers exceptional structural integrity, providing support for larger openings without compromising strength or performance. Uncoated steel will corrode over time, but modern systems are factory-finished with galvanising, zinc coatings, and durable powdercoat or paint finishes to ensure long-term weather resistance. Specialty options like stainless steel or Corten are also available for projects in harsh or coastal environments, or where a distinctive patina is desired.

Some suppliers offer thermally broken profiles which include an insulating core that separates the interior and exterior faces of the frame, significantly improving thermal performance and helping the building envelope meet its energy efficiency requirements.

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PO Box 44237, Point Chevalier,
Auckland 1246, New Zealand

+64 9 815 3550