



A MORE COMFORTABLE HOME ALL YEAR ROUND

*Double Glazing Selection
Metro Performance Glass*



THERE'S MORE TO WINDOWS THAN MEETS THE EYE



**DOUBLE GLAZING WILL
MAKE A DIFFERENCE
TO THE COMFORT OF
YOUR HOME AND YOUR
ENERGY BILLS.**

Windows are a key design feature of your home, but they also play a huge role in determining your comfort levels. They can help insulate against temperature extremes and reduce your power bills. They can fill your home with natural light while reducing glare; and they can reduce noise levels inside.

Double glazing provides all these benefits, and more. Crucially, double glazed windows help reduce the likelihood of condensation, which keeps your home drier and healthier, all year round.

But it's also what you can't see that makes the difference – the componentry engineered into every window ensures there is a high-performance product for every situation.

WHAT IS DOUBLE GLAZING?

Double glazing from Metro is an Insulated Glass Unit (IGU) that is assembled and sealed in a controlled factory environment.

Having two pieces of glass in the double glazed unit allows each pane to be different to meet varied performance requirements. Combining these two different pieces of glass with gas in between and a Warm Edge 3 spacer bar will give you an even greater level of performance.

Whether you live in Southland, Otago, Hawke's Bay, Northland or a busy, noisy city, Metro Performance Glass has a range of double-glazing options to suit your home. We can also provide high performance double glazing that has thermal performance attributes comparable to that of triple glazing without the added bulk, loss of light transmission or an extra reflective surface.



DOUBLE-GLAZING COMPONENTS

- 1 Double glazing comprises two panes of glass, one exterior, with Surface 1, and one interior pane with surfaces 3 and 4 effectively counted from the outside in. For added insulation Metro Low E (low emissivity) protective coating is applied to surface 2.
- 2 For standard or classic double glazing the gas inside is air. Argon, as a denser gas than air, is also available to further improve thermal insulation performance. Krypton gas, only available in Low E Xtreme provides the best thermal insulation performance being a denser gas than Argon.
- 3 Double-glazing units vary in thickness depending on the spacer used and the thickness of the glass. Thicker glass, and/or laminates, are used for high wind zones, safety and sound reduction.

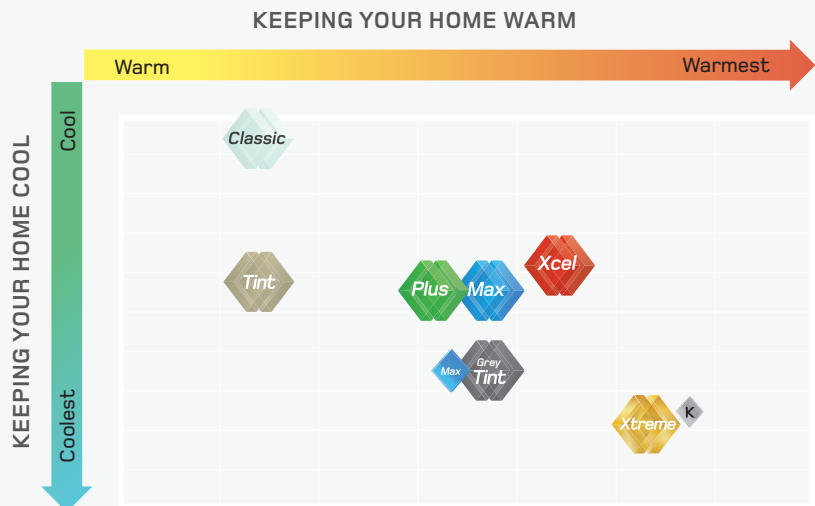
KEEPING YOUR HOME WARM

NZ COLD TEMPERATURE ZONES

OBJECTIVE:
keep home warm
in the winter

- Zone 1
- Zone 2
- Zone 3
- Zone 4

As a general guide, if you live in Zone 1, your recommended choice is likely to be **Low E Plus**. If you live in Zone 2, a suitable glass choice is likely to be **Low E Max**. In Zone 3, **Low E Xcel** and **Low E Xtreme** are likely to be your suitable options. And in Zone 4, **Low E Xtreme** is the best option for your home.



Note tint is an average of Bronze and Grey, Green will let in more light between Low E Max and Xcel

DURING WINTER,
ESPECIALLY IN THE
COLDER REGIONS,
HOMES WITH SINGLE
GLAZING AND STANDARD
DOUBLE GLAZING
CAN LOSE SIGNIFICANT
HEAT THROUGH THE
WINDOWS.

Metro Performance Glass has a range of Low E double glazing that improves the thermal insulation of your windows and ultimately reduces heat loss in your home.

When looking out through Low E (low emissivity) glass the virtually invisible high-tech coating lets light into your home, while reflecting heat. It still lets in the natural light, for a lighter, brighter, healthier home.

Houses in different parts of the country are suited to different types of double glazing. And it is

important to note your priorities in terms of insulation levels, solar gain, glare and sound control to ensure you get the best performance glass for your home.

For example, large, standard double glazing units may let in more light, but they may also increase solar heat gain in summer, depending on which direction they face. And in extreme conditions, dew can often form on the outside of the heavily insulated performance glass windows.

WEERS RATING OVERVIEW

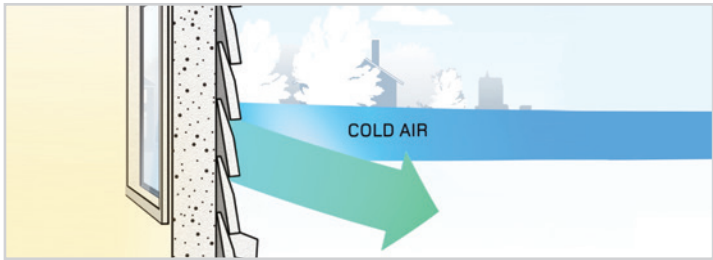
	<div>Classic</div> <div>Double Glazing</div>	<div>Low E Plus</div> <div>Double Glazing</div>	<div>Low E Max</div> <div>Double Glazing</div>	<div>Low E Xcel</div> <div>Double Glazing</div>	<div>Low E Xtreme</div> <div>Double Glazing</div>
Using a standard aluminium frame	2	3	3.5	4	5.5
Using a thermal aluminium, wood or uPVC frame	2.5	4.5	5	5.5	6

The WEERS rating numbers give a quick overview of thermal performance of the Metro Low E range in a standard aluminum frame or thermally broken frames. This enables you to select a level that best suits you and your home.

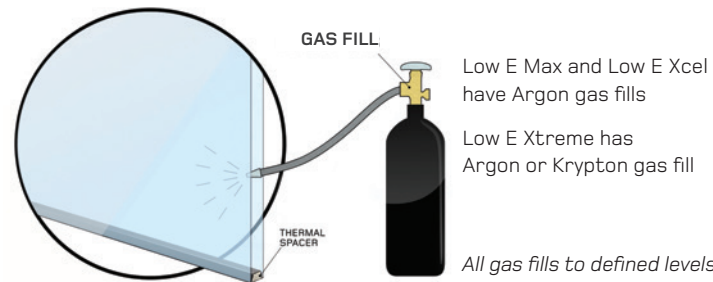
The protective, high-tech coating on Low E glass effectively forms a barrier, reflecting heat back from the glass to reduce heat loss, while at the same time reducing solar gain.



In particular during winter, Low E glass reflects heat back into the room, so less heat is lost through the windows. In summer, the sun's heat is reflected back outside.



Low E glass also works to keep the heat in during winter, reducing the chance of condensation.



Low E double glazing performance is increased with the addition of a thermal spacer and gas.



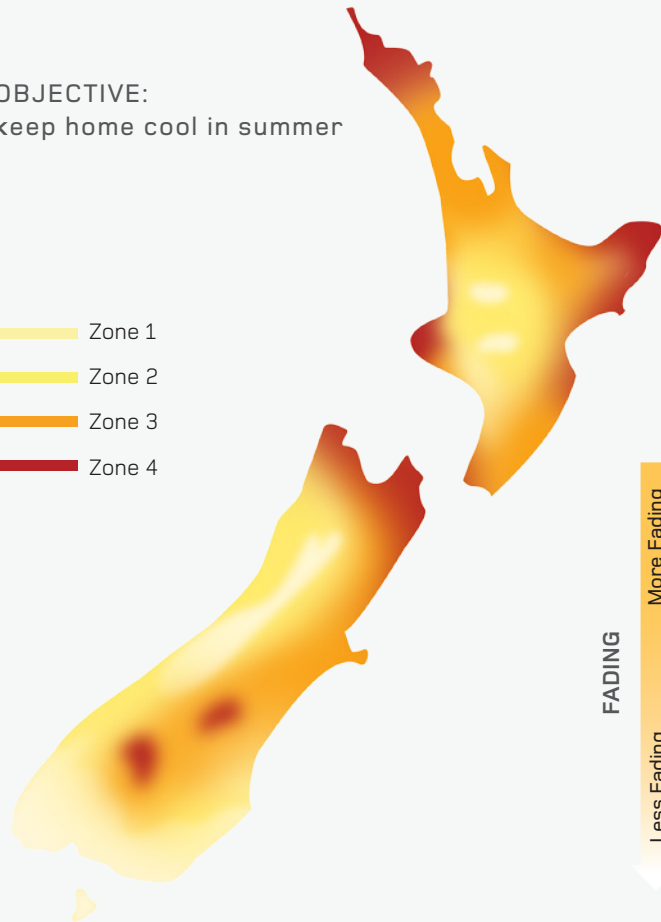
*WEERS ratings is based on an average house lot of joiner, for more detail please contact Metro Glass.

KEEPING YOUR HOME COOL AND REDUCE FADING

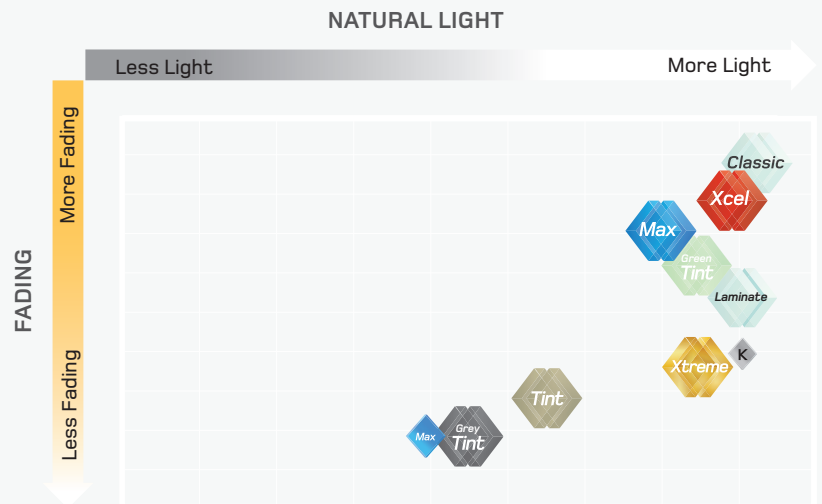
NZ SUNSHINE & HEAT ZONES

OBJECTIVE:
keep home cool in summer

- Zone 1
- Zone 2
- Zone 3
- Zone 4



As a general guide, if you live in Zone 1, your recommended choice is likely to be **Classic** or **Low E Xcel**. If you live in Zone 2 or 3 **Low E Max**. And in Zone 4, **Low E Max** combined with a tint or **Low E Xtreme** for solar control and an open and bright home.



LARGE AREAS OF
CLEAR GLASS ARE
A WONDERFUL WAY
TO CREATE A BRIGHT,
HEALTHY HOME – LIGHT
HAS BEEN SHOWN
TO REDUCE BACTERIA
BUILD-UP IN DUST
BY HALF.

Along with natural light large windows can also let in a lot of heat and UV rays that can be harmful to artwork, carpets and furniture.

Glass naturally blocks UVB rays, and with the addition of a laminate it can block the majority of the UVA rays. The type of Low E double glazing chosen also determines whether

infrared light (radiant heat), visible light (glare) can also be reduced.

Body tinted glass works to reduce the amount of heat and light transfer, to help keep summer heat out and reduce glare.

With tints being on the outside piece of glass, the double glazing unit does heat up, and needs to be



toughened to avoid thermal cracking or breakage. Tints will also make the home darker.

Solar control Low E double glazing avoids this. It reduces the heat and glare while maintaining the right level of Visible Light Transfer (VLT) into your home.

Your choice will also depend on where

you live. For example, if you live in Zone 4 on the Central Plateau, you may wish to choose Low E Xcel or even Low E Xtreme with a laminate for the ultimate performance.

The latter lets in a good amount of light and will outperform all tints. However, if you live in the warmer regions, Low E Max may be better

suited to also reduce overheating in the summer.

Remember, solar control is especially important in New Zealand, as we have high UV levels, driven by clean air, the ozone hole, and Earth's orbit, which brings us closer to the sun in summer than the northern hemisphere in summer

PRIVACY



**WE ALL LOVE PRIVACY,
BUT THIS CAN BE
COMPROMISED BY LARGE
EXPANSES OF GLASS.
AND THIS IS ESPECIALLY
TRUE OF URBAN AREAS
WHERE HOUSES ARE
CLOSE TOGETHER.**

Fortunately, there are ways you can increase the amount of light coming into your home with increased glazing that is thermally efficient without sacrificing privacy.

Patterned, obscured/frosted, tinted and reflective glass are all options for double glazing units. Digitally printed patterns are now also used extensively. It's even possible to print patterns or graduated frosting effects to let in light at the top while providing privacy at the bottom.

Patterned and obscured glass diffuse

the light to reduce visibility through the glass while still allowing light to transmit into the living space.

Tinted glass works by reducing the amount of visible light both in and out of the home.

Reflective glass, typically seen in office buildings, provides a one-way mirror effect during the day. This blocks visibility externally in the day and internally at night. With the lights on at night you can clearly see in to the home.

REDUCE NOISE



IF YOU LIVE ON A BUSY ROAD, NEAR TRAIN TRACKS OR A SCHOOL, OR EVEN IF YOU HAVE NOISY, BOISTEROUS CHILDREN OF YOUR OWN, YOU WILL KNOW HOW DISRUPTIVE EXCESSIVE NOISE CAN BE.

There are two different ways to reduce the transmission of noise through your windows by mass: using thicker glass, or a wider spacer between the glass and laminate, or a combination of the above.

Acoustic laminates are used in most applications to avoid extra weight and thickness on the double glazing. However, if noise reduction is a key issue, it's best to engage an acoustics consultant to assess your home and make a recommendation

in respect of the key frequencies of the sound at your location.

It is important that safety and structural requirements for your build are considered at the same time to ensure they provide a complete solution. For example, the interaction of glass, joinery and the building envelope are key.

For the best sound reduction, thermally broken frames are recommended.

SAFETY AND SECURITY



SAFETY AROUND THE HOME IS OF PARAMOUNT IMPORTANCE, WITH SAFETY GLASS REQUIRED WHEREVER THERE IS RISK OF HUMAN IMPACT – THIS IS MANDATED BY THE NZ BUILDING CODE.

There are two main options for safety glass – toughened and laminated.

Toughened glass has undergone heat treatment and is ideal for safety, strength and temperature resistance. If it is broken, it will break into small pieces, which reduces the risk of injury.

Laminated glass incorporates an interlayer between two pieces of glass. It is much more difficult to break and if it does, the interlayer holds the glass fragments together. Laminated glass is an option for areas close to doors or latches to reduce the chance of burglars

breaking the glass and entering your home.

Toughened or laminated glass is also used frequently in areas with a high wind load, for the increased strength it provides.

On rare occasions generic toughened safety glass may break spontaneously, whereby it explodes suddenly without warning. Lamination of toughened safety glass is also an option. A preventative measure by way of factory testing is available to significantly reduce such a likelihood. Refer to your closest Metro branch for further details.



KEEPING YOUR HOME DRIER



Windows don't create condensation. It's the moisture level in the air that causes this to happen. The lower the internal temperature of the home and the higher the internal moisture levels, the greater the chance of condensation occurring.

Typically, in modern homes the increased levels of insulation and better performing windows have helped mitigate most of the weeping windows evident in older single-glazed homes. Double glazing works to form a thermal barrier to the outside, making the inner side of the double glazing warmer, which helps prevent internal condensation.

High-performing Low E double glazing will significantly reduce the likelihood of internal condensation. However it is so efficient, morning dew can form on the outside glass surface, often seen as external condensation. When external temperatures are low and humidity levels are high this is when it is most likely to occur. Homes that have no eaves, are sheltered from



prevailing breezes and high humidity/cold conditions overnight, (normally experienced in Spring and Autumn) are more likely to see this occur.

This is an indication of how well the double glazing is working, and it will dissipate through the morning, given a breeze or exposure to the sun. Dew on the outside of the windows is particularly evident with house designs that have no eaves and are sheltered from prevailing breezes.

REMOVING MOISTURE

It's important to note that the average home releases around 8 litres of water a day into the air, from activities such as cooking, showering, clothes-drying, indoor plants etc.

To help remove excess moisture, ventilation is key. Solutions for this can include extractor fans, dehumidifiers, air conditioning, thermally broken frames and passive ventilation in your window joinery.



DESIGN FOR COMFORT & ENERGY EFFICIENCY



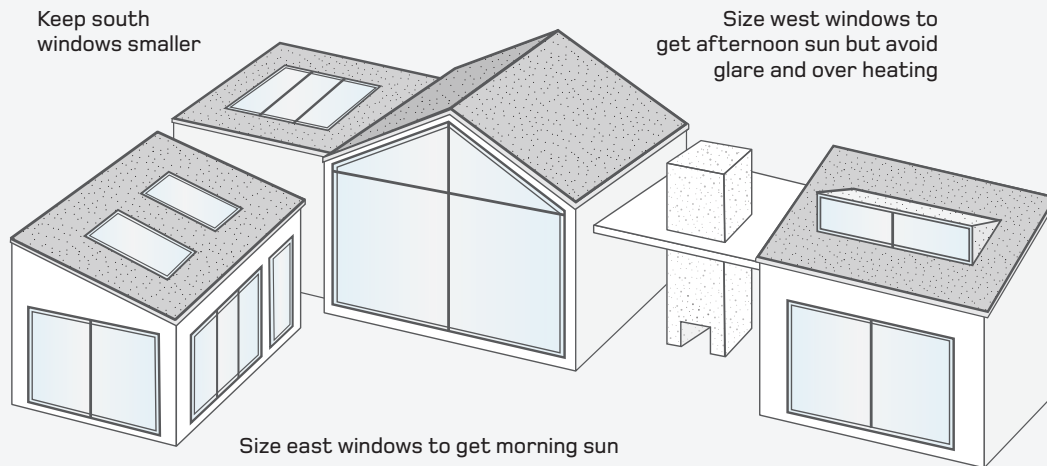
ARCHITECTS AND DESIGNERS TODAY PLACE A PRIORITY ON USING ACTIVE & PASSIVE DESIGN TECHNIQUES – DESIGNING HOMES TO HAVE BOTH COMFORTABLE LIVING SPACES WHILE ALSO BEING ENERGY EFFICIENT. RESULTING IN LESS INVESTMENT IN HEATING AND COOLING DEVICES WITH THE ASSOCIATED RUNNING COSTS.

Architects and designers specify good insulation and design a house with cross ventilation that will help keep your home at a comfortable temperature on hot days.

But it's useful to know the role windows play in achieving a comfortable home, especially in light of the trend for expansive areas of glazing to maximise natural light and views – not to mention the demand for extra-wide openings that allow an easy indoor-outdoor flow.

Ideally, larger windows (and living areas) are on the east and north-facing side of the home, with smaller windows to the west and south. This reduces the chance of overheating on the west side, and reduces the impact of cold on the south side of the home in the winter months. It is worth considering moving living spaces to the north side if you are planning a renovation. However, if your main views are to the south or west, you can

GENERIC WINDOW PLACEMENT AND SIZE CONSIDERATIONS



override these design considerations with high-performance Low E double glazing, in conjunction with thermally broken frames.

Consider, also, windows above eye height. Clerestory windows let in light, yet still allow plenty of wall space and privacy. These windows are particularly useful for a south-facing house where they can let in light from the north (at the rear).

Skylights and roof windows are other ways to bring in light.

EAVES

For the past three decades there has been a trend towards houses with no eaves. But eaves have real advantages. They provide shade when the sun is at its highest in summer, but sunlight can still come into your home in winter when you most need it.

Eaves also help to reduce external dew forming on the outside of south-facing windows, which is more evident with higher performing double glazing.

ABOVE AND BEYOND

With great insulation and efficient window frames, your double-glazing selection can provide performance significantly beyond the minimum requirements of the NZ Building Code – for the life of your home.

As New Zealand's largest double glazing producer, Metro Performance Glass can work with you and your window supplier to develop the best solution for your home, customised if necessary to meet your needs.



Contact your local
Metro representative
for more information
about our range of
Low E Double Glazing.

www.metroglass.co.nz



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 **METRO**
PERFORMANCE GLASS