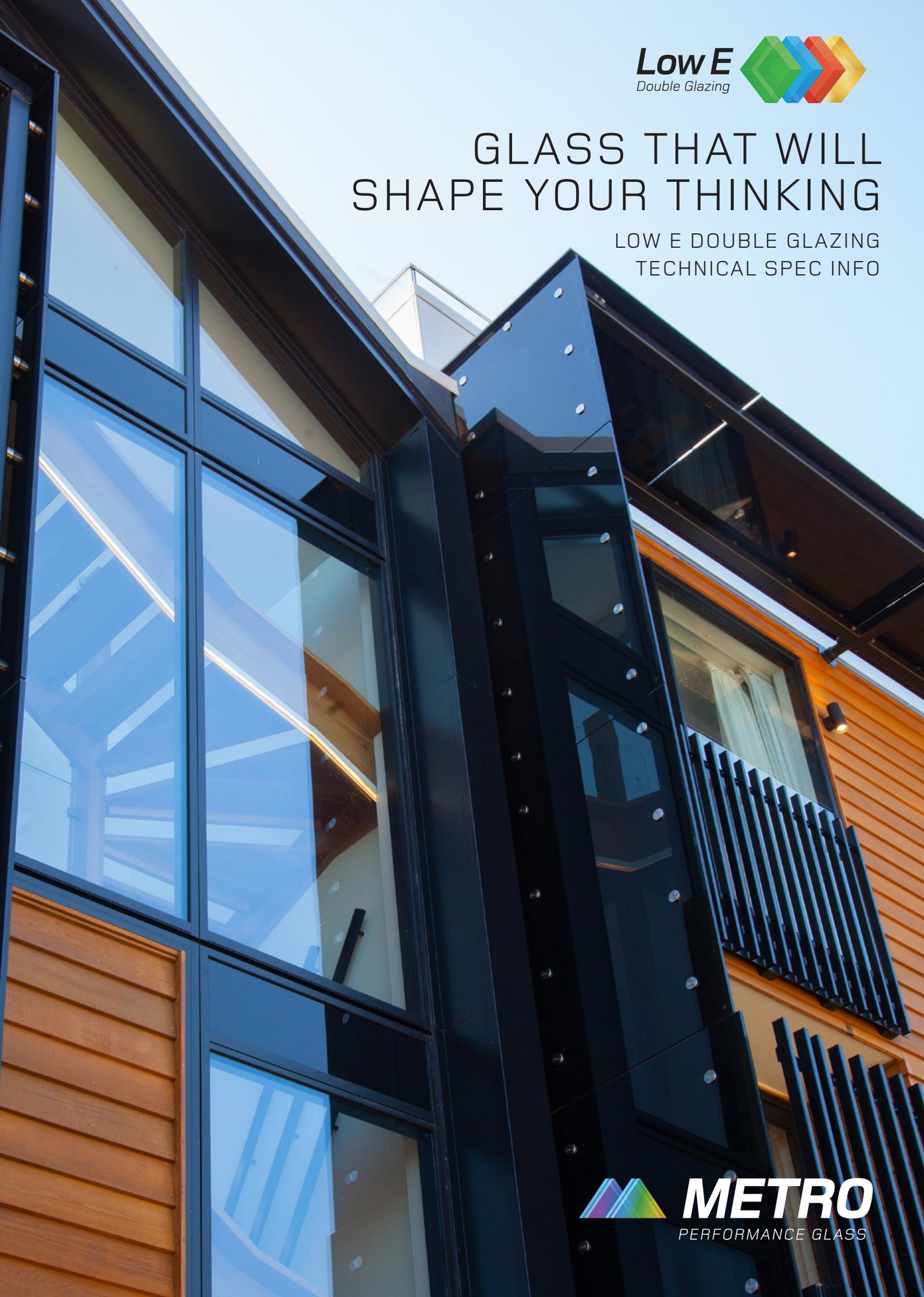




GLASS THAT WILL SHAPE YOUR THINKING

LOW E DOUBLE GLAZING
TECHNICAL SPEC INFO



MORE OPTIONS. MORE PERFORMANCE.

Metro Performance Glass offers a range of double glazing units that incorporate the latest in Low Emissivity technology. Your designs can be tailored to match the conditions, with the best combination of insulation, anti-fading and clarity.



Non Low E Glass Standard Spacer ⁷

	Standard Aluminium Frame ¹		Thermally broken Aluminium Frame ²		Heat Loss & Condensation	Visibility & Glare			Heat Gain			Fading
	WEERS ³	R (Rw avg) ¹	WEERS ¹	R (Rw avg) ¹	U (Ug Cog) ³	VLT ⁴	VLR-E ⁴	VLR-I ⁴	SF	SC ⁴	LSG ⁵	Tdw-ISO ⁶
Make-up (mm) ²	Indicative Rating	Indicative R Value	Indicative Rating	Indicative R Value	U Value ⁶	Visible Light Transmission	External Reflectance	Internal Reflectance	Solar heat gain co-efficient	Shading co-efficient	Light to solar gain ratio	
4-8-4	2.0	0.26-0.28	2.5	0.29-0.31	3.1	82%	15%	15%	77%	0.89	1.06	0.74
4-10-4	2.0	0.26-0.28	2.5	0.29-0.31	3.0	82%	15%	15%	77%	0.89	1.06	0.74
4-12-4	2.0	0.26-0.28	2.5	0.29-0.31	2.9	82%	15%	15%	77%	0.89	1.06	0.74
4-14-4	2.0	0.26-0.28	2.5	0.29-0.31	2.8	82%	15%	15%	77%	0.89	1.06	0.74
4-16-4	2.0	0.26-0.28	0.0	0.29-0.31	2.7	82%	15%	15%	77%	0.89	1.06	0.74



High Clarity, Low Haze Low E Glass ^{2,7}

	Standard Aluminium Frame ¹		Thermally broken Aluminium Frame ²		Heat Loss & Condensation	Visibility & Glare			Heat Gain			Fading
	WEERS ³	R (Rw avg) ¹	WEERS ¹	R (Rw avg) ¹	U (Ug Cog) ³	VLT ⁴	VLR-E ⁴	VLR-I ⁴	SF	SC ⁴	LSG ⁵	Tdw-ISO ⁶
Make-up (mm) ²	Indicative Rating	Indicative R Value	Indicative Rating	Indicative R Value	U Value ⁶	Visible Light Transmission	External Reflectance	Internal Reflectance	Solar heat gain co-efficient	Shading co-efficient	Light to solar gain ratio	
4-8-4	3.0	0.32-0.34	4.5	0.41-0.43	2.3	69%	12%	13%	58%	0.66	1.19	0.64
4-10-4	3.0	0.32-0.34	4.5	0.41-0.43	2.1	69%	12%	13%	58%	0.66	1.19	0.64
4-12-4	3.0	0.32-0.34	4.5	0.41-0.43	1.9	69%	12%	13%	57%	0.66	1.21	0.64
4-14-4	3.0	0.32-0.34	4.5	0.41-0.43	1.8	69%	12%	13%	57%	0.66	1.21	0.64
4-16-4	3.0	0.32-0.34	4.5	0.41-0.43	1.7	69%	12%	13%	57%	0.66	1.21	0.64



High Clarity, Low Haze Low E Glass, includes Argon Gas and Thermal Spacer ^{2,7}

	Standard Aluminium Frame ¹		Thermally broken Aluminium Frame ²		Heat Loss & Condensation	Visibility & Glare			Heat Gain			Fading
	WEERS ³	R (Rw avg) ¹	WEERS ¹	R (Rw avg) ¹	U (Ug Cog) ³	VLT ⁴	VLR-E ⁴	VLR-I ⁴	SF	SC ⁴	LSG ⁵	Tdw-ISO ⁶
Make-up (mm) ²	Indicative Rating	Indicative R Value	Indicative Rating	Indicative R Value	U Value ⁶	Visible Light Transmission	External Reflectance	Internal Reflectance	Solar heat gain co-efficient	Shading co-efficient	Light to solar gain ratio	
4-8-4	3.5	0.35-0.37	5.0	0.44-0.47	2.0	69%	12%	13%	57%	0.66	1.21	0.64
4-10-4	3.5	0.35-0.37	5.0	0.44-0.47	1.8	69%	12%	13%	57%	0.66	1.21	0.64
4-12-4	3.5	0.35-0.37	5.0	0.44-0.47	1.6	69%	12%	13%	57%	0.66	1.21	0.64
4-14-4	3.5	0.35-0.37	5.0	0.44-0.47	1.5	69%	12%	13%	57%	0.66	1.21	0.64
4-16-4	3.5	0.35-0.37	5.0	0.44-0.47	1.5	69%	12%	13%	57%	0.66	1.21	0.64

See back for tint options

TERMINOLOGY

- R:** The higher the R value the better the windows thermal performance.
- U:** The lower the U Value the lower the heat transfer, the better the thermal insulation.
- VLT:** The higher the percentage the more daylight transmitted.
- VLR-E:** The higher the percentage the more light reflection.
- SHGC:** The lower the solar heat gain coefficient the less solar heat it transmits.
- SC:** The lower the shading coefficient the less heat gain and thus more shading is provided by the glass.
- LSG:** If the LSG is greater than 1.0, then the glass transmits more light than heat.
- Tdw-ISO:** The lower the TDW-ISO the greater the reduction in fading by the glass.



High Performance High Clarity, Low Haze Low E Glass, includes Argon Gas and Thermal Spacer ^{2,7}

Make-up (mm) ²	Standard Aluminium Frame ¹		Thermally broken Aluminium Frame ²		Heat Loss & Condensation		Visibility & Glare			Heat Gain			Fading
	WEERS ³	R (Rw avg) ¹	WEERS ¹	R (Rw avg) ¹	U (Ug Cog) ³	U (Ug Cog) ³	VLT ⁴	VLR-E ⁴	VLR-I ⁴	SF	SC ⁴	LSG ⁵	Tdw-ISO ⁶
	Indicative Rating	Indicative R Value	Indicative Rating	Indicative R Value	U Value ⁶	U Value ⁶	Visible Light Transmission	External Reflectance	Internal Reflectance	Solar heat gain co-efficient	Shading co-efficient	Light to solar gain ratio	
4-8-4	4.0	0.38-0.4	5.5	0.48-0.54	1.7	1.7	80%	13%	13%	60%	0.69	1.33	0.69
4-10-4	4.0	0.38-0.4	5.5	0.48-0.54	1.5	1.5	80%	13%	13%	60%	0.69	1.33	0.69
4-12-4	4.0	0.38-0.4	5.5	0.48-0.54	1.3	1.3	80%	13%	13%	60%	0.69	1.33	0.69
4-14-4	4.0	0.38-0.4	5.5	0.48-0.54	1.2	1.2	80%	13%	13%	60%	0.69	1.33	0.69
4-16-4	4.0	0.38-0.4	5.5	0.48-0.54	1.1	1.1	80%	13%	13%	60%	0.69	1.33	0.69



High Performance High Clarity Solar Control Low E includes Argon or Krpton with Thermal Spacer ^{2,7}



Make-up (mm) ²	Standard Aluminium Frame ¹		Thermally broken Aluminium Frame ²		Heat Loss & Condensation		Visibility & Glare			Heat Gain			Fading
	WEERS ³	R (Rw avg) ¹	WEERS ¹	R (Rw avg) ¹	U (Ug Cog) ³	U (Ug Cog) ³	VLT ⁴	VLR-E ⁴	VLR-I ⁴	SF	SC ⁴	LSG ⁵	Tdw-ISO ⁶
	Indicative Rating	Indicative R Value	Indicative Rating	Indicative R Value	U Value ⁶	U Value ⁶	Visible Light Transmission	External Reflectance	Internal Reflectance	Solar heat gain co-efficient	Shading co-efficient	Light to solar gain ratio	
4-8-4	5.5	0.48-0.54	6.0	0.55-0.60	1.6	1.1	75%	14%	14%	41%	0.47	1.87	0.48
4-10-4	5.5	0.48-0.54	6.0	0.55-0.60	1.4	0.9	75%	14%	14%	41%	0.47	1.87	0.48
4-12-4	5.5	0.48-0.54	6.0	0.55-0.60	1.2	0.9	75%	14%	14%	41%	0.47	1.87	0.48
4-14-4	5.5	0.48-0.54	6.0	0.55-0.60	1.1	1.0	75%	14%	14%	41%	0.47	1.87	0.48
4-16-4	5.5	0.48-0.54	6.0	0.55-0.60	1.0	1.0	75%	14%	14%	41%	0.47	1.87	0.48

NOTES:

¹Based on an average new house lot of joinery to determine the average R-value (Rw avg) and Window Energy Efficiency Rating System (WEERS) rating. The average house lot of joinery totals 41m² of glazing in a typical frame with 3 doors and 17 windows. The Indicative WEERS star ratings shown are a guide and will vary with different frame types and or window/door sizes. The WEERS scale is out of 6, the higher the star rating the better the windows thermal performance.

²Low E Coating on Surface 2 for standard units and Surface 3 for tint units.

³U value is centre of glass (in W/m².K) calculated for glass oriented vertically on LBL W7 software using CEN conditions - air OR argon = (90% argon, 10% air mix) or a Krypton, air mix.

⁴SC, SF, VLT, VLR-E, VLR-I, Tdw-ISO calculated on LBL W7 and manufacturers software using CEN conditions.

⁵LSG = VLT / SF (If the LSG is greater than 1.0, then the

glass transmits more light than heat).

⁶Tdw-ISO is a damage-weighted transmittance from the International Standards Organization (ISO) based on the contribution to fading at each wavelength from 300nm to 700nm that include the UV and Visible parts of the solar spectrum.

⁷Stated performance values can vary based on variations during production, use of float glass substrates on the basis of availability etc. Allowable variation is 3 basis points above or below the specified values for VLT, VLR-E, VLR-I and SF and +/- 0.1 for U-Value.

Condensation - Low E double glazed units make the internal glass temperature warmer and reduce the onset of condensation on the inner glass surface.

External Dew - Low E double glazed units are so efficient they can sometimes cause the outer panes to dew as the outer pane surface is colder due to less heat loss.

For more information call 0800 545 800

THERMAL PERFORMANCE

SELECTION

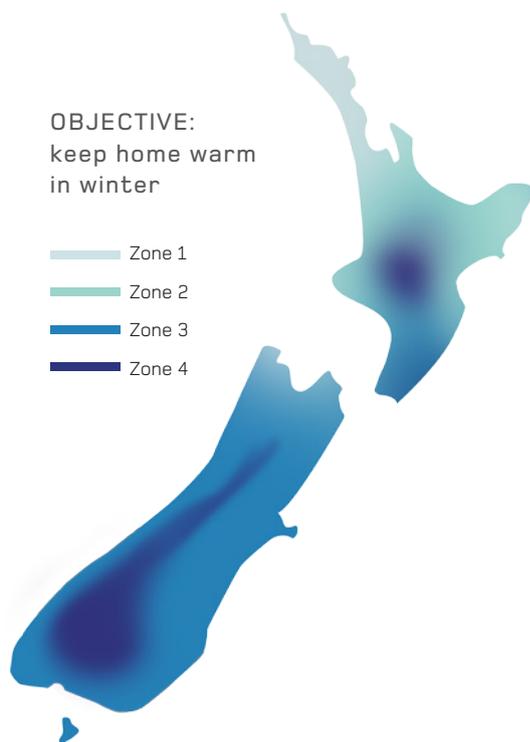
When selecting the right double glazing for your home one of the main considerations is generally around keeping your home warm in winter. In making this choice there are some areas in New Zealand that will also receive significant amounts of sunshine in the summer so can also be potential for overheating.

The diagram below shows the relative performance

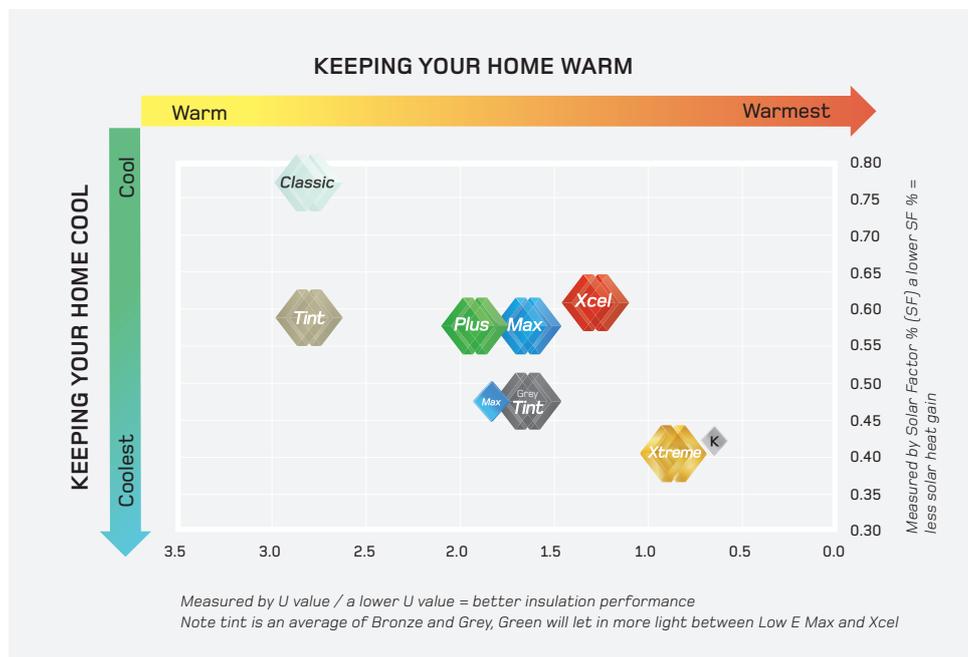
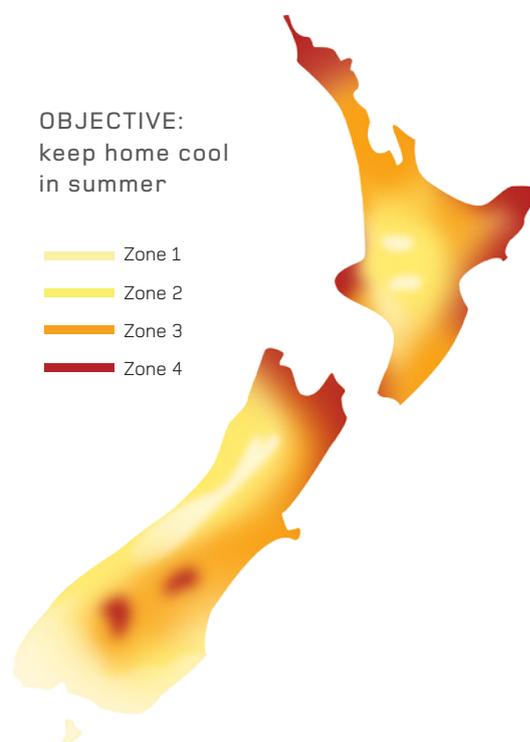
of double glazing options, plotted by keeping your home warm in winter and cool in summer

The building code specifies a minimum standard Classic Double Glazing (indicated in the diagram below); Low E Double Glazing will however do a much better job in thermally insulating your home and also keep your home cooler when compared to the use of traditional tints.

NZ COLD TEMPERATURE ZONES



NZ SUNSHINE & HEAT ZONES



SOLAR CONTROL PERFORMANCE DATA^{2,7}

 Classic Double Glazing	Make-up mm(5)	VL ^T (%) ⁴	VLR-E (%) ⁴	VLR-I (%) ⁴	SF ⁴	SC ⁴	LSG ⁵	UVTdw-ISO ⁶
		Visible Light Transmission	External Reflectance	Internal Reflectance	Solar Factor	Shading co-efficient	Light to solar gain ratio	Fading Reduction
Laminated	4-12-6.38	80%	15%	15%	75%	0.86	1.07	0.57
Green	4-12-4	73%	13%	14%	55%	0.64	1.31	0.60
Bronze	4-12-4	56%	9%	13%	60%	0.68	0.95	0.46
Grey	4-12-4	52%	8%	13%	56%	0.64	0.92	0.45

 Laminate Double Glazing	Make-up mm(5)	VL ^T (%) ⁴	VLR-E (%) ⁴	VLR-I (%) ⁴	SF ⁴	SC ⁴	LSG ⁵	UVTdw-ISO ⁶
		Visible Light Transmission	External Reflectance	Internal Reflectance	Solar Factor	Shading co-efficient	Light to solar gain ratio	Fading Reduction
Clear Float	4-12-6.38	80%	15%	15%	75%	0.86	1.07	0.57
Green	4-12-6.38	71%	13%	14%	59%	0.67	1.20	0.48
Bronze	4-12-6.38	55%	9%	13%	64%	0.74	0.86	0.36
Grey	4-12-6.38	50%	8%	12%	61%	0.70	0.82	0.35

 Low E Plus Double Glazing	Make-up mm(5)	VL ^T (%) ⁴	VLR-E (%) ⁴	VLR-I (%) ⁴	SF ⁴	SC ⁴	LSG ⁵	UVTdw-ISO ⁶
		Visible Light Transmission	External Reflectance	Internal Reflectance	Solar Factor	Shading co-efficient	Light to solar gain ratio	Fading Reduction
Laminated	4-12-6.38	68%	12%	12%	56%	0.65	1.20	0.50
Green	4-12-4	61%	11%	11%	49%	0.57	1.24	0.52
Bronze	4-12-4	47%	8%	10%	51%	0.59	0.93	0.39
Grey	4-12-4	44%	7%	10%	48%	0.55	0.90	0.39

 Low E Max Double Glazing	Make-up mm(5)	VL ^T (%) ⁴	VLR-E (%) ⁴	VLR-I (%) ⁴	SF ⁴	SC ⁴	LSG ⁵	UVTdw-ISO ⁶
		Visible Light Transmission	External Reflectance	Internal Reflectance	Solar Factor	Shading co-efficient	Light to solar gain ratio	Fading Reduction
Laminated	4-12-6.38	68%	12%	12%	56%	0.65	1.20	0.50
Green	4-12-4	61%	11%	11%	49%	0.57	1.24	0.52
Bronze	4-12-4	47%	8%	10%	51%	0.59	0.92	0.39
Grey	4-12-4	44%	7%	10%	48%	0.55	0.90	0.39

 Low E Xcel Double Glazing	Make-up mm(5)	VL ^T (%) ⁴	VLR-E (%) ⁴	VLR-I (%) ⁴	SF ⁴	SC ⁴	LSG ⁵	UVTdw-ISO ⁶
		Visible Light Transmission	External Reflectance	Internal Reflectance	Solar Factor	Shading co-efficient	Light to solar gain ratio	Fading Reduction
Laminated	4-12-6.38	79%	13%	12%	59%	0.68	1.33	0.55
Green	4-12-4	72%	11%	12%	47%	0.54	1.53	0.57
Bronze	4-12-4	55%	8%	11%	47%	0.54	1.18	0.43
Grey	4-12-4	51%	7%	11%	44%	0.51	1.15	0.43

 Low E Xtreme Double Glazing	Make-up mm(5)	VL ^T (%) ⁴	VLR-E (%) ⁴	VLR-I (%) ⁴	SF ⁴	SC ⁴	LSG ⁵	UVTdw-ISO ⁶
		Visible Light Transmission	External Reflectance	Internal Reflectance	Solar Factor	Shading co-efficient	Light to solar gain ratio	Fading Reduction
Laminated	4-12-6.38	74%	13%	14%	40%	0.46	1.84	0.43
Clear Float	4-12-4	75%	13%	14%	40%	0.46	1.86	0.48

NOTES:

Principally Low E and Tint combinations are used to increase privacy and or reduce glare, heat gain and fading. The standard tints in this table are body-tinted glass; thicker glass tints will further reduce the glare and associated performance data.

Aesthetically tints are generally put on the outside pane of the unit. When units are sitting next to each other in a window frame or close to each other, they

should have the same thickness of tinted glass to reduce the potential for colour variation. All data for the table above is calculated with a Low E on Surface 3 of the unit and the tint on the outer pane. U value performance is unaffected by the inclusion of tints so please reference the previous charts for U value data.

It is strongly recommended to heat treat tinted panes to reduce the risk of thermal breakages.



SOLAR CONTROL

SELECTION

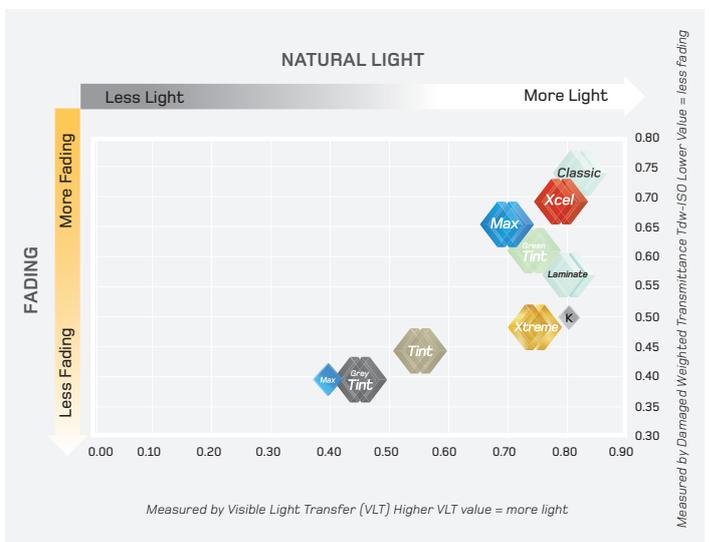
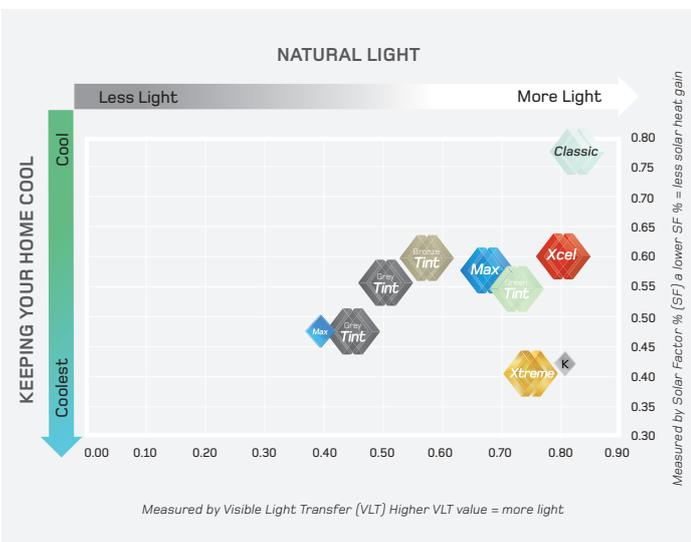
In selecting the right double glazing for a home consider the balance of letting in as much light as possible and not having a house that overheats unduly fades furniture and fittings.

The two diagrams below show the trade offs of letting in more light, keeping the home warm and keeping the home cool.

As UV is only 40% of the cause of fading, it is possible to use Low E with a tint. However this reduces significantly the amount of light that

enters the home. The unique, virtually invisible coating in Low E Xtreme performs at a similar level as a tint might. While it will help keep your home warm in winter, it will also help keep you home cool in summer. Laminates will only reduce UV and make no difference to heat gain from the sun.

If fading is a key performance requirement refer to the solar control performance data page of this brochure. The key performance number is the Tdw-ISO number with the lower the number the lower the greater the fading reduction.



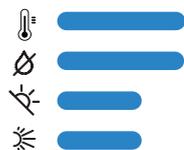
Classic
Double Glazing



Low E Plus
Double Glazing



Low E Max
Double Glazing



Low E Xcel
Double Glazing



Low E Xtreme
Double Glazing



WEERS RATING

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



HEAT RETENTION – keeping the warmth in and the cold out



CONDENSATION AVOIDANCE – reducing the chance of internal condensation and crying windows



REDUCTION IN SOLAR GAIN – keeping your home cool and comfortable in hot weather



VISIBLE LIGHT TRANSMISSION – maintaining natural light levels inside your home



With increased heat retention performance and or greater solar control there are reductions in heating or cooling costs



With increased heat retention there is greater chance of dew forming overnight