Red List Free

INTERNATIONAL LIVING FUTURE INSTITUTE

Low E
Double Glazing

LOW E DOUBLE GLAZING RANGE
TECHNICAL SPECIFICATION DATA

METRO
PERFORMANCE GLASS

NEW ZEALAND BUILDING CODE (NZBC) CLIMATE ZONES

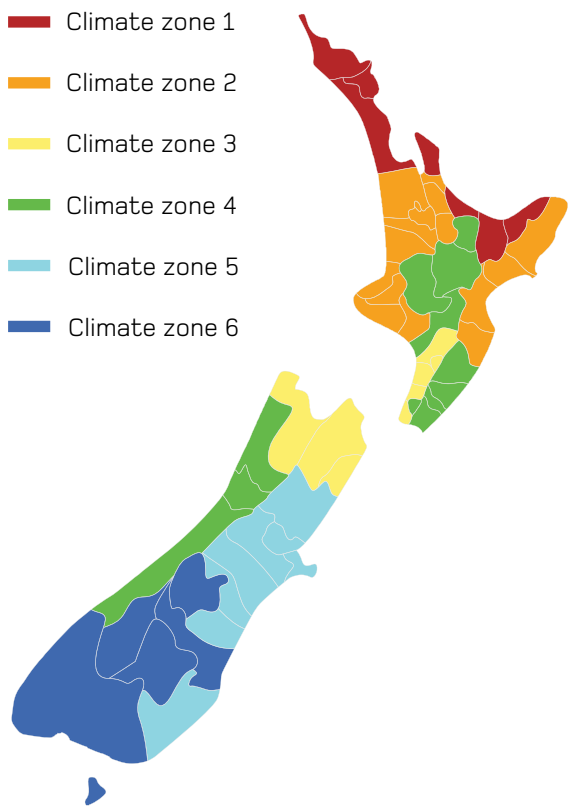
When selecting the right double glazing for your home, the building code stipulates the minimum standard, by climate zone as pictured below:

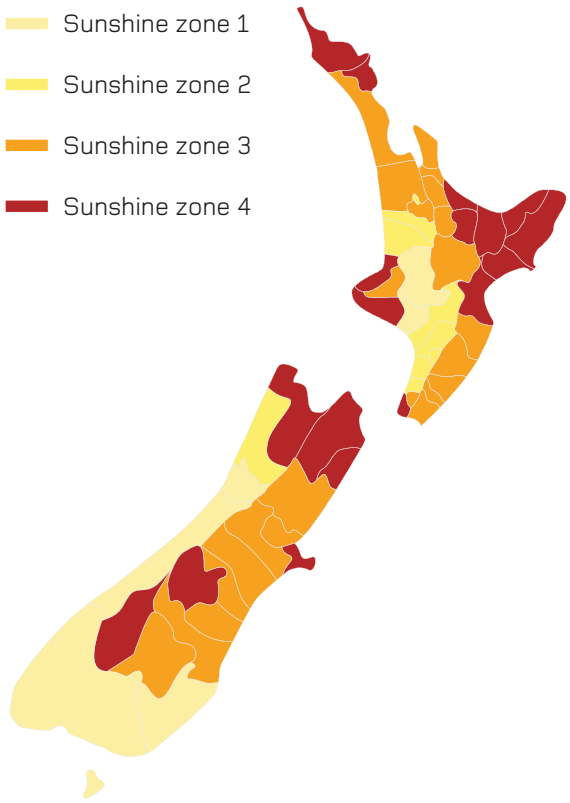
The climate zones also align to territorial authorities to enable clear performance requirements for building consents.

The minimum requirement by system type is shown in the data tables and info graphic on the back page, for the three stages of implementation.

Across New Zealand there are also zones with significant amounts of sunshine in the summer, resulting in the potential for overheating. Choose double glazing with a lower solar factor to reduce the chance of overheating. Illustrated as Sunshine Zone 4 the most likely to have high sunshine hours.

NZ CLIMATE ZONES (FROM THE NZ BUILDING CODE) & SUNSHINE ZONES





Territorial Authority climate zone lookup - www.metroglass.co.nz/window-glazing/window-specifying-new-homes-and-housing/

NOTES:

[1]Low E Coating on Surface 2 for standard units and Surface 3 for tint units.
[2]Ug Value is centre of glass (COG in W/m2.K) calculated for glass oriented vertically, with proprietary software using CEN boundary conditions. Cavity infills based on air or argon = (90% argon, 10% air mix).
[3]SC, SF, VLT, VLR-E, VLR-I, Tdw-ISO calculated with proprietary software using CEN boundary conditions.
[4]LSG = VLT / SF (If the LSG is greater than 1.0, then the glass transmits more light than total solar heat).
[5]Tdw-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.
Tolerances - stated 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 (+/- 3) 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 likelihood of condensation on the inner glass surface.
External Condensation (Dew) - Low E double glazed units are so efficient they can, subject to external environmental conditions and factors, sometimes cause external condensation as the outer pane surface 1 can get colder due to less heat loss from the inside.
Quality – It should be noted that each pane of double glazing units is subject to the same quality standards as single glass. The applicable standard is AS/NZ4667.2000 standard and is applied in conjunction with the viewing criteria documented by the Window and Glass Association (www.wganz.co.nz Guide to Visual Quality of Glass in Residential Buildings) and MBIE Guide (www.building.govt.nz Guide to tolerances, materials and workmanship in new residential construction)

NZBC SELECTION – NEW HOUSING TRANSITION STAGES

The H1/AS1 Schedule method allows the choice of a generic window frame type and what Low E double glazing option will meet the Schedule minimums. This covers the majority of NZ homes with a maximum 30% window-to-wall ratio*. Homes with glazing beyond this will use either calculation or modeling for compliance, however the Schedule method still provides indicative guidance***.

Stage One

Consents lodged for **Housing**
3rd Nov 2022 - 30st Apr 2023

	Classic Double Glazing	Low E Max Double Glazing	Low E Xcel Double Glazing	Low E SunX Grey Double Glazing	Low E Xtreme Double Glazing
	Standard clear double glazing -std spacer **need to add argon**	Entry level soft coat Low E, argon gas thermal spacer	Extra clear soft coat Low E, argon gas, thermal spacer	Grey tone soft coat Low E, argon gas, thermal spacer	High performance soft coat Low E, argon gas, thermal spacer + solar control
Based on 14mm Spacer**	U_g Value 2.6	U_g Value 1.5	U_g Value 1.1	U_g Value 1.3	U_g Value 1.1
Climate Zones 1, 2, 3, 4, 5 & 6 R_{window} R0.37	uPVC / Timber	uPVC / Thermal Aluminum / Timber	Standard Aluminum / uPVC / Thermal Aluminum / Timber	uPVC / Thermal Aluminum / Timber	Standard Aluminum / uPVC / Thermal Aluminum / Timber

Stage Two

Consents lodged for **Housing**
1st May 2023 - 1st Nov 2023

	Classic Double Glazing	Low E Max Double Glazing	Low E Xcel Double Glazing	Low E SunX Grey Double Glazing	Low E Xtreme Double Glazing
	Standard clear double glazing -std spacer **need to add argon**	Entry level soft coat Low E, argon gas thermal spacer	Extra clear soft coat Low E, argon gas, thermal spacer	Grey tone soft coat Low E, argon gas, thermal spacer	High performance soft coat Low E, argon gas, thermal spacer + solar control
Based on 14mm Spacer**	U_g Value 2.6	U_g Value 1.5	U_g Value 1.1	U_g Value 1.3	U_g Value 1.1
Climate Zones 1 & 2 R_{window} R0.37	uPVC / Timber	uPVC / Thermal Aluminum / Timber	Standard Aluminum / uPVC / Thermal Aluminum / Timber	uPVC / Thermal Aluminum / Timber	Standard Aluminum / uPVC / Thermal Aluminum / Timber
Climate Zones 3 & 4 R_{window} R0.46	*N/A*	uPVC / Timber	uPVC / Thermal Aluminum / Timber	uPVC / Thermal Aluminum / Timber	uPVC / Thermal Aluminum / Timber
Climate Zones 5 & 6 R_{window} R0.50	*N/A*	uPVC / Timber	uPVC / Thermal Aluminum / Timber	uPVC / Timber	uPVC / Thermal Aluminum / Timber

Stage Three

Consents lodged for Housing and Buildings upto 300m2
From 2nd Nov 2023

	Classic Double Glazing	Low E Max Double Glazing	Low E Xcel Double Glazing	Low E SunX Grey Double Glazing	Low E Xtreme Double Glazing
	Standard clear double glazing -std spacer **need to add argon**	Entry level soft coat Low E, argon gas thermal spacer	Extra clear soft coat Low E, argon gas, thermal spacer	Grey tone soft coat Low E, argon gas, thermal spacer	High performance soft coat Low E, argon gas, thermal spacer + solar control
Based on 14mm Spacer**	U_g Value 2.6	U_g Value 1.5	U_g Value 1.1	U_g Value 1.3	U_g Value 1.1
Climate Zones 1, 2, 3 & 4 R_{window} R0.46	*N/A*	uPVC / Timber	uPVC / Thermal Aluminum / Timber	uPVC / Thermal Aluminum / Timber	uPVC / Thermal Aluminum / Timber
Climate Zones 5 & 6 R_{window} R0.50	*N/A*	uPVC / Timber	uPVC / Thermal Aluminum / Timber	uPVC / Timber	uPVC / Thermal Aluminum / Timber

Notes:

* Other criteria for using the Schedule method, along with the 30% window-to-wall ratio, is detailed in section 2.1.2.1 of H1/AS1.

** U_g Value is centre-of-glass (in $W/m^2.K$) calculated for glass oriented vertically, with proprietary software using CEN boundary conditions.

*** Calculation can be used for window-to-wall ratio 0-40%, modeling for greater than 40% whereby it may be possible to use a lower performing glass or frame on the margins.

**** Compliance in the H1/AS1 Schedule to a colder climate zone requirement automatically ensures compliance to a warmer climate.

www.metroglass.co.nz

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M005APR23V2

METRO PERFORMANCE GLASS

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 suit the conditions, with the combination of thermal insulation, anti-fading, clarity etc as appropriate.

The Metro Glass Low E Double Glazing range is Declare label certified.

Classic Double Glazing

Clear - Air - Clear - Standard Spacer

	Building Code Acceptable Solution H1/AS1 Schedule (see schedule notes)				EN 673 Heat Loss & Condensation	EN410 Visibility			EN410 Heat Gain			EN410 Fading
	Window System Material Type by Climate Zone				**Ug[2]**	**VLT[3]**	**VLR-E[3]**	**VLR-I[3]**	**SF[3]**	**SC[3]**	**LSG[3,4]**	**Tdw-ISO[3,5]**
Make-up mm[1]	Standard Aluminium	Thermal Break Aluminium	uPVC	Timber	U Value	Visible Light Transmission	External Reflectance	Internal Reflectance	Solar Factor (g)	Shading co-efficient	Selectivity	Damaged Weighted Transmission
4-8-4					3.1	82%	15%	15%	77%	0.89	1.06	0.74
4-10-4					3.0	82%	15%	15%	77%	0.89	1.06	0.74
4-12-4					2.9	82%	15%	15%	77%	0.89	1.06	0.74
4-14-4					2.8	82%	15%	15%	77%	0.89	1.06	0.74
4-16-4			Zones 1-6 Stage One	Zones 1-6 Stage One	2.7	82%	15%	15%	77%	0.89	1.06	0.74
4-18-4			Zones 1-6 Stage One	Zones 1-6 Stage One	2.7	82%	15%	15%	77%	0.89	1.06	0.74

(Note argon needs to be requested for building code compliance to achieve U Value of 2.6 for uPVC and Timber)

Low E Max Double Glazing

Low E Max - Argon - Clear - Thermal Spacer

	Building Code Acceptable Solution H1/AS1 Schedule (see schedule notes)				EN 673 Heat Loss & Condensation	EN410 Visibility			EN410 Heat Gain			EN410 Fading
	Window System Material Type by Climate Zone				**Ug[2]**	**VLT[3]**	**VLR-E[3]**	**VLR-I[3]**	**SF[3]**	**SC[3]**	**LSG[3,4]**	**Tdw-ISO[3,5]**
Make-up mm[1]	Standard Aluminium	Thermal Break Aluminium	uPVC	Timber	U Value	Visible Light Transmission	External Reflectance	Internal Reflectance	Solar heat gain co-efficient	Shading co-efficient	Light to solar gain ratio	Damaged Weighted Transmission
4-8-4			Zones 1-6 Stage One	Zones 1-6 Stage One	2.0	69%	12%	13%	57%	0.66	1.21	0.64
4-10-4		Zones 1-6 Stage One	Zones 5-6 Stage Two	Zones 5-6 Stage Two	1.8	69%	12%	13%	57%	0.66	1.21	0.64
4-12-4		Zones 1-6 Stage One	Zones 5-6 Stage Two	Zones 5-6 Stage Two	1.6	69%	12%	13%	57%	0.66	1.21	0.64
4-14-4		Zones 1-6 Stage One	Zones 5-6 Stage Two	Zones 5-6 Stage Two	1.5	69%	12%	13%	57%	0.66	1.21	0.64
4-16-4		Zones 1-6 Stage One	Zones 5-6 Stage Two	Zones 5-6 Stage Two	1.5	69%	12%	13%	57%	0.66	1.21	0.64
4-18-4		Zones 1-6 Stage One	Zones 5-6 Stage Two	Zones 5-6 Stage Two	1.5	69%	12%	13%	57%	0.66	1.21	0.64

TERMINOLOGY

R: The higher the R value the better the double glazing and correspondingly the window's thermal performance.

Ug: The lower the U Value the lower the heat transfer, the better the thermal insulation.

Cog: Both U and R values are Cog which = centre-of-glass measure designating glass performance only and not the whole window.

VLT: The higher the percentage the more daylight transmitted and the greater the glare.

VLR-E: The higher the percentage the more the light reflection looking into the building.

VLR-I: The higher the percentage the more the light reflection looking out of the building.

SF: The lower the solar factor or total energy transmittance coefficient the lesser the solar heat transmitted. SF is designated g value in Europe.

SC: The lower the shading coefficient the lesser the solar heat gain and the greater the shading provided by the glass.

LSG: If the LSG is greater than 1.0, then the glass transmits more light than solar heat, also termed as selectivity.

Tdw-ISO: The lower the Tdw-ISO the greater the reduction in fading damage through the glass.

Low E Xcel Double Glazing

Low E Xcel - Argon - Clear - Thermal Spacer

	Building Code Acceptable Solution H1/AS1 Schedule (see schedule notes)				EN 673 Heat Loss & Condensation	EN410 Visibility			EN410 Heat Gain			EN410 Fading
	Window System Material Type by Climate Zone				**Ug[2]**	**VLT[3]**	**VLR-E[3]**	**VLR-I[3]**	**SF[3]**	**SC[3]**	**LSG[3,4]**	**Tdw-ISO[3,5]**
Make-up mm[1]	Standard Aluminium	Thermal Break Aluminium	uPVC	Timber	U Value	Visible Light Transmission	External Reflectance	Internal Reflectance	Solar Factor (g)	Shading co-efficient	Selectivity	Damaged Weighted Transmission
4-8-4		Zones 1-6 Stage One	Zones 5-6 Stage Two	Zones 5-6 Stage Two	1.7	80%	13%	13%	60%	0.69	1.33	0.69
4-10-4		Zones 1-6 Stage One	Zones 5-6 Stage Two	Zones 5-6 Stage Two	1.5	80%	13%	13%	60%	0.69	1.33	0.69
4-12-4		Zones 3-4 Stage Two	Zones 5-6 Stage Two	Zones 5-6 Stage Two	1.3	80%	13%	13%	60%	0.69	1.33	0.69
4-14-4	Zones 1-6 Stage One	Zones 3-4 Stage Two	Zones 5-6 Stage Two	Zones 5-6 Stage Two	1.1	80%	13%	13%	60%	0.69	1.33	0.69
4-16-4	Zones 1-6 Stage One	Zones 5-6 Stage Two	Zones 5-6 Stage Two	Zones 5-6 Stage Two	1.1	80%	13%	13%	60%	0.69	1.33	0.69
4-18-4		Zones 5-6 Stage Two	Zones 5-6 Stage Two	Zones 5-6 Stage Two	1.2	80%	13%	13%	60%	0.69	1.33	0.69

Low E SunX Grey Double Glazing

Low E SunX™ Grey - Argon - Clear - Thermal Spacer

	Building Code Acceptable Solution H1/AS1 Schedule (see schedule notes)				EN 673 Heat Loss & Condensation	EN410 Visibility			EN410 Heat Gain			EN410 Fading
	Window System Material Type by Climate Zone				**Ug[2]**	**VLT[3]**	**VLR-E[3]**	**VLR-I[3]**	**SF[3]**	**SC[3]**	**LSG[3,4]**	**Tdw-ISO[3,5]**
Make-up mm[1]	Standard Aluminium	Thermal Break Aluminium	uPVC	Timber	U Value	Visible Light Transmission	External Reflectance	Internal Reflectance	Solar Factor (g)	Shading co-efficient	Selectivity	Damaged Weighted Transmission
4-8-4		Zones 1-6 Stage One	Zones 5-6 Stage Two	Zones 5-6 Stage Two	1.8	42%	8%	12%	33%	0.38	1.27	0.45
4-10-4		Zones 1-6 Stage One	Zones 5-6 Stage Two	Zones 5-6 Stage Two	1.6	42%	8%	12%	33%	0.38	1.27	0.45
4-12-4		Zones 1-6 Stage One	Zones 5-6 Stage Two	Zones 5-6 Stage Two	1.4	42%	8%	12%	33%	0.38	1.33	0.45
4-14-4		Zones 3-4 Stage Two	Zones 5-6 Stage Two	Zones 5-6 Stage Two	1.3	42%	8%	12%	33%	0.38	1.33	0.45
4-16-4		Zones 3-4 Stage Two	Zones 5-6 Stage Two	Zones 5-6 Stage Two	1.3	42%	8%	12%	33%	0.38	1.33	0.45
4-18-4		Zones 3-4 Stage Two	Zones 5-6 Stage Two	Zones 5-6 Stage Two	1.3	42%	8%	12%	33%	0.38	1.33	0.45

Low E Xtreme Double Glazing

Low E Xtreme - Argon - Clear - Thermal Spacer

	Building Code Acceptable Solution H1/AS1 Schedule (see schedule notes)				EN 673 Heat Loss & Condensation	EN410 Visibility			EN410 Heat Gain			EN410 Fading
	Window System Material Type by Climate Zone				**Ug[2]**	**VLT[3]**	**VLR-E[3]**	**VLR-I[3]**	**SF[3]**	**SC[3]**	**LSG[3.4]**	**Tdw-ISO[3,5]**
Make-up mm[1]	Standard Aluminium	Thermal Break Aluminium	uPVC	Timber	U Value	Visible Light Transmission	External Reflectance	Internal Reflectance	Solar Factor (g)	Shading co-efficient	Selectivity	Damaged Weighted Transmission
4-8-4		Zones 1-6 Stage One	Zones 5-6 Stage Two	Zones 5-6 Stage Two	1.6	75%	14%	14%	41%	0.47	1.87	0.48
4-10-4		Zones 1-6 Stage One	Zones 5-6 Stage Two	Zones 5-6 Stage Two	1.4	75%	14%	14%	41%	0.47	1.87	0.48
4-12-4		Zones 3-4 Stage Two	Zones 5-6 Stage Two	Zones 5-6 Stage Two	1.2	75%	14%	14%	41%	0.47	1.87	0.48
4-14-4	Zones 1-6 Stage One	Zones 5-6 Stage Two	Zones 5-6 Stage Two	Zones 5-6 Stage Two	1.1	75%	14%	14%	41%	0.47	1.87	0.48
4-16-4	Zones 1-6 Stage One	Zones 5-6 Stage Two	Zones 5-6 Stage Two	Zones 5-6 Stage Two	1.0	75%	14%	14%	41%	0.47	1.87	0.48
4-18-4	Zones 1-6 Stage One	Zones 5-6 Stage Two	Zones 5-6 Stage Two	Zones 5-6 Stage Two	1.1	75%	13%	14%	40%	0.46	1.87	0.48

SOLAR CONTROL TINT & LAMINATE PERFORMANCE DATA[2,7]

Low E SunX™ Grey's colour tone is part of the Low E coating so you get a constant colour across different glass thicknesses. While also getting improved U Value and solar control from the Low E coating.

All other tints listed below are Body Tints generally used for increased privacy, reduce glare, direct heat gain and or fading. Body Tints do not improve the U value's. Body tinted double glazing should be of the same thickness, as thicker body tinted glass is darker. Tinted double glazed units are subject to greater heat buildup on building elevations that are exposed to direct sunlight. Heat buildup in glass can lead to thermal breakage, this risk can be reduced through heat treated glass.

Combining a laminate in double glazing is used to reduce UV transmission and reduce noise transfer.

Classic Double Glazing	Make-up mm[1]	Ug[2] Heat Loss & Condensation	VLT (%)[3] Visible Light Transmission	VLR-E (%)[3] External Reflectance	VLR-I (%)[3] Internal Reflectance	SF[3] Solar Factor g value	SC[3] Shading co-efficient	LSG[3,4] Light to solar gain ratio	UV Tdw-ISO[3,5] Fading Reduction
Green Tint	4-12-4	2.9	73%	13%	14%	55%	0.64	1.31	0.60
Bronze Tint	4-12-4	2.9	56%	9%	13%	60%	0.68	0.95	0.46
Grey Tint	4-12-4	2.9	52%	8%	13%	56%	0.64	0.92	0.45

Laminate Double Glazing	Make-up mm[1]	Ug[2] Heat Loss & Condensation	VLT (%)[3] Visible Light Transmission	VLR-E (%)[3] External Reflectance	VLR-I (%)[3] Internal Reflectance	SF[3] Solar Factor g value	SC[3] Shading co-efficient	LSG[3,4] Light to solar gain ratio	UV Tdw-ISO[3,5] Fading Reduction
Clear Float	4-12-6.38	2.9	80%	15%	15%	75%	0.86	1.07	0.57
Green Tint	4-12-6.38	2.9	71%	13%	14%	59%	0.67	1.20	0.48
Bronze Tint	4-12-6.38	2.9	55%	9%	13%	64%	0.74	0.86	0.36
Grey Tint	4-12-6.38	2.9	50%	8%	12%	61%	0.70	0.82	0.35

Low E Max Double Glazing	Make-up mm[1]	Ug[2] Heat Loss & Condensation	VLT (%)[3] Visible Light Transmission	VLR-E (%)[3] External Reflectance	VLR-I (%)[3] Internal Reflectance	SF[3] Solar Factor g value	SC[3] Shading co-efficient	LSG[3,4] Light to solar gain ratio	UV Tdw-ISO[3,5] Fading Reduction
Laminated	4-12-6.38	1.6	68%	12%	12%	56%	0.65	1.20	0.50
Green Tint	4-12-4	1.6	61%	11%	11%	49%	0.57	1.24	0.52
Bronze Tint	4-12-4	1.6	47%	8%	10%	51%	0.59	0.92	0.39
Grey Tint	4-12-4	1.6	44%	7%	10%	48%	0.55	0.90	0.39

Low E Xcel Double Glazing	Make-up mm[1]	Ug[2] Heat Loss & Condensation	VLT (%)[3] Visible Light Transmission	VLR-E (%)[3] External Reflectance	VLR-I (%)[3] Internal Reflectance	SF[3] Solar Factor g value	SC[3] Shading co-efficient	LSG[3,4] Light to solar gain ratio	UV Tdw-ISO[3,5] Fading Reduction
Laminated	4-12-6.38	1.3	79%	13%	12%	59%	0.68	1.33	0.55
Green Tint	4-12-4	1.3	72%	11%	12%	47%	0.54	1.53	0.57
Bronze Tint	4-12-4	1.3	55%	8%	11%	47%	0.54	1.18	0.43
Grey Tint	4-12-4	1.3	51%	7%	11%	44%	0.51	1.15	0.43

Low E SunX Grey Double Glazing	Make-up mm[1]	Ug[2] Heat Loss & Condensation	VLT (%)[3] Visible Light Transmission	VLR-E (%)[3] External Reflectance	VLR-I (%)[3] Internal Reflectance	SF[3] Solar Factor g value	SC[3] Shading co-efficient	LSG[3,4] Light to solar gain ratio	UV Tdw-ISO[3,5] Fading Reduction
Laminated	4-12-6.38	1.4	42%	8%	12%	32%	0.37	1.33	0.34

Low E Xtreme Double Glazing	Make-up mm[1]	Ug[2] Heat Loss & Condensation	VLT (%)[3] Visible Light Transmission	VLR-E (%)[3] External Reflectance	VLR-I (%)[3] Internal Reflectance	SF[3] Solar Factor g value	SC[3] Shading co-efficient	LSG[3,4] Light to solar gain ratio	UV Tdw-ISO[3,5] Fading Reduction
Laminated	4-12-6.38	1.2	74%	13%	14%	40%	0.46	1.84	0.43
Clear Float	4-12-4	1.2	75%	13%	14%	40%	0.46	1.86	0.48
Green Tint	4-12-4	1.2	67%	12%	13%	38%	0.44	1.75	0.41
Bronze Tint	4-12-4	1.2	52%	9%	12%	35%	0.40	1.48	0.31
Grey Tint	4-12-4	1.2	48%	8%	12%	33%	0.38	1.45	0.30