Comparativa Premium vs Premium 2

Make-up Name	Make-up Icon	Outboard Substrate & Coating	Transmittance			Reflectance				Absorptance	U-Value (U_g)	Shading Coefficient (sc)	Solar Factor (g)	Secondary Heat Transfer (q_i)	General Colour Rendering Index (R_a)
						Visible		Solar							
			Visible (τ_v %)	UV (τ_{uv} %)	Solar (τ_e %)	ρ_v % out	ρ_v % in	ρ_e % out	ρ_e % in	Solar (α_e %)					
4//16//CG Premium2 4		Guardian Float Glass ExtraClear (CE)	81.9	36.7	58.0	12.4	12.6	28.0	28.0	13.9	1.36	0.73	63.9	5.8	98.1
4//16//CG Premium 4		Guardian Float Glass ExtraClear (CE)	80.1	34.6	54.5	12.2	12.3	28.8	27.8	16.7	1.36	0.72	62.5	8.1	97.3

Calculation Standard: EN 410:2011 / EN 673:2011

4//16//CG Premium2 4

Outdoors

LITE	Guardian Float Glass ExtraClear (CE) Thickness = 4mm	#1 ----- #2 -----
GAP	100% Air, 16mm (.630")	
LITE	Guardian Float Glass ExtraClear (CE) Thickness = 4mm	#3 ClimaGuard® Premium2 (CE) #4 -----

Total Unit = 0.934 in / 23.72 mm Slope = 90°

Indoors

4//16//CG Premium 4

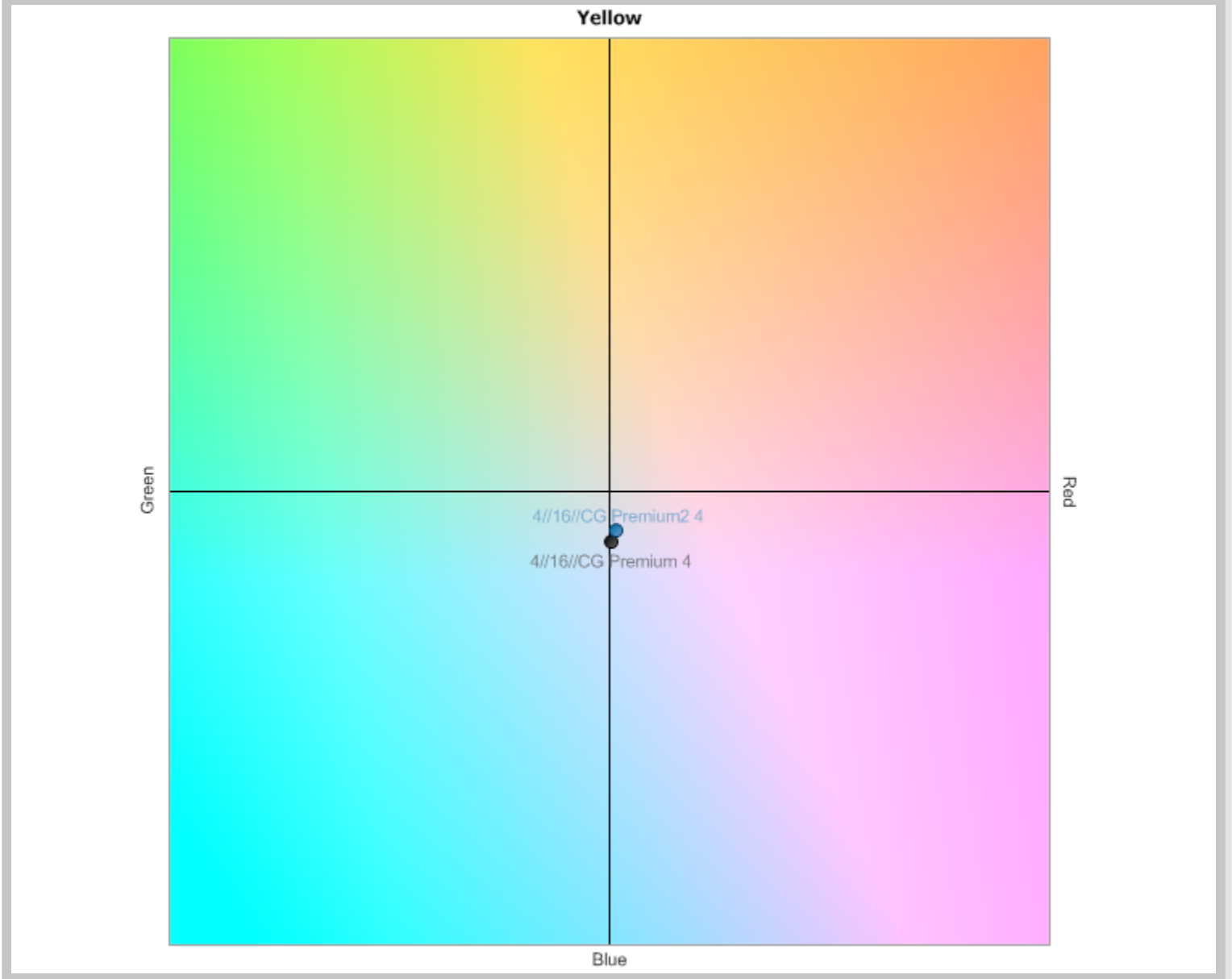
Outdoors

LITE	Guardian Float Glass ExtraClear (CE) Thickness = 4mm	#1 ----- #2 -----
GAP	100% Air, 16mm (.630")	
LITE	Guardian Float Glass ExtraClear (CE) Thickness = 4mm	#3 ClimaGuard® Premium (CE) #4 -----

Total Unit = 0.934 in / 23.72 mm Slope = 90°

Indoors

Color Comparison Chart: Outdoor Reflected Color



Important Notes

The performance values shown above represent NOMINAL VALUES for the center of glass with no spacer system or framing. Slight variations may occur due to manufacturing tolerances, point of manufacture, and type of instrumentation used to measure the optical properties. For configurations that include non-specular (diffuse) components, performance results cannot be verified and should only be used as a general indication of performance. For configurations which include ceramic frit coating, the actual values may vary significantly based upon the thickness and composition of the frit. For configurations with coatings laminated facing the PVB, there may be a noticeable color change. Guardian recommends a full size mock-up be approved. Calculations and terms in this report are based on EN 410:2011 and EN 673:2011. The KIWA logo and KIWA Validation Report MD – 14/477/GL are provided as evidence of validation of the Guardian Performance Calculator software, program version 4.1, for execution of calculations of luminous and solar characteristics of glazing and thermal transmittance according to EN 410:2011 and EN 673:2011.

Explanation of Terms

% Transmittance Visible or Light Transmittance (τ_V %)is the percentage of visible light at normal incidence (90° to surface) that is transmitted by the glass. Visible Light is defined as radiant energy in the wavelength range of 380 nm to 780 nm with Ill. D65 and CIE 2° observer.

% Ultraviolet (UV) Transmittance (τ_{uv} %) is the percentage of ultraviolet light at normal incidence directly transmitted by the glass. Ultraviolet Light is defined as radiant energy from the sun having a wavelength range of 280 nm to 380 nm at an air mass of 1.0, global, per CIE #85: 1989.

% Solar Energy Direct Transmittance (τ_e %) is the percentage of solar energy at normal incidence directly transmitted by the glass. Solar Energy is the radiant energy from the sun having a wavelength range of 300 nm to 2500 nm at an air mass of 1.0, global, per CIE #85: 1989.

% Reflectance Visible Outdoors or Light Reflectance Out (ρ_v % out) is the percentage of visible light at normal incidence directly reflected by the glass back outdoors.

% Reflectance Visible Indoors or Light Reflectance In (ρ_v % in) is the percentage of visible light at normal incidence directly reflected by the glass back indoors.

% Solar Energy Reflected Outdoors or Solar Direct Reflectance Out (ρ_e % out) is the percentage of solar energy at normal incidence directly reflected by the glass back outdoors.

% Solar Energy Reflected Indoors or Solar Direct Reflectance In (ρ_e % in) is the percentage of solar energy at normal incidence directly reflected by the glass back indoors.

Absorptance (α_e %) (Solar, Visible or UV) is defined as a process in which a range of radiation is retained by a substance and converted into heat energy. The creation of heat energy also causes the substance to emit its own radiation.

U value - parameter of glazing which characterizes the heat transfer through the central part of the glazing, i.e. without edge effects, and states the steady-state density of heat transfer rate per temperature difference between the environmental temperatures on each side.

The U value is given by: $1/U = 1/h_e + 1/h_t + 1/h_i$

Where h_e and h_i are the external and internal heat transfer coefficients; h_t is the total thermal conductance of the glazing. The U value is given in watts per square metre Kelvin [W/(m²×K)].

The external heat transfer coefficient h_e is a function of the wind speed near the glazing, the emissivity and other climatic factors. For ordinary vertical glass surfaces the value of h_e is standardised to 25 W/(m²×K) for the purposes of comparison of glazing U values.

Corrected emissivity of uncoated soda lime and borosilicate glass surface is 0,837. This procedure does not consider the improvement of the U value due to the presence of externally exposed coated surfaces with an emissivity lower than 0,837. Temperature difference between bounding glass surfaces is 15 K. Mean temperature of gas space is 283 K

R-Value is a measure of thermal resistance. The higher the value, the greater the insulating value. R-value is the reciprocal of U-Value.

Shading Coefficient (sc) Solar Factor divided by 0.87, is a measure of the solar heat gain referenced to 3 mm clear glass designated the value of 1.00. Also known as b-Value, fraction of the incident solar energy (short wave + long wave) transferred through the glazing.

Solar Factor or Total Solar Energy Transmittance or g-value (g) is the percentage of total solar energy (direct and indirect or absorbed) transferred indoors through the glass. 3 mm clear glass has a g-value of approximately 86 and a shading coefficient of 100%.

Secondary Heat Transfer Factor (q_i) results from heat transfer by convection and longwave IR-radiation of that part of the incident solar radiation which has been absorbed by the glazing.

Colour Rendering Index in transmission, D65 (R_a) is the change in colour of an object as a result of the light being transmitted by the glass.

Emissivity is the ratio of the radiance from the surface to that from a black body viewed under identical optical and geometrical conditions and at the same temperature. The emissivity value given to a material is the ratio of heat emitted compared to a black body, on a scale of 0 to 1. A black body would have an emissivity of 1 and a perfect reflector would have a value of 0.

Normal Emissivity (ε_n) refers to the ratio, in a direction normal to the surface, of the emissive power of the surface of the glass to the emissive power of a black body.

Corrected Emissivity (ε) is calculated by multiplying the normal emissivity n by a suitable correction coefficient, selected according to the normal emissivity value. The values of the correction coefficients were decided on the basis of extensive measurements of the angular emissivity of uncoated glass, borosilicate glass and glass ceramics and of architectural coated

glass. The corrected emissivity of uncoated float glass, borosilicate glass and glass-ceramics at 283 K was standardized at 0.837.

Disclaimer

This performance analysis is provided for the limited purpose of assisting the user in evaluating the performance of the glass products identified on this report. Spectral data for products manufactured by Guardian reflect nominal values derived from typical production samples. Spectral data for products not manufactured by Guardian were derived from the LBNL International Glazing Database and have not been independently verified by Guardian. The values calculated by this tool are generated according to established engineering practices and applicable calculation standards. Many factors may affect glass performance, including glass size, building orientation, shading, wind speed, type of installation, and others. The applicability and results of the analysis are directly related to user inputs and any changes in actual conditions can have a significant effect on the results. It is possible to create many different glazing types and glass make-ups using this tool. Guardian makes no guarantee that any glazing modeled by the tool is available from Guardian or any other manufacturer. The user has the responsibility to check with the manufacturer regarding availability of any glass type or make-up. While Guardian has made a good faith effort to verify the reliability of this tool, it may contain unknown programming errors that could result in incorrect results. The user assumes all risk relating to the results provided by the tool and is solely responsible for selection of appropriate products for the user's application. GUARDIAN MAKES NO EXPRESS OR IMPLIED WARRANTY OF ANY KIND WITH RESPECT TO THE PERFORMANCE CALCULATOR. THERE ARE NO WARRANTIES OF MERCHANTABILITY, NON-INFRINGEMENT OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE PERFORMANCE CALCULATOR AND NO WARRANTY SHALL BE IMPLIED BY OPERATION OF LAW OR OTHERWISE. IN NO EVENT SHALL GUARDIAN BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, CONSEQUENTIAL OR INCIDENTAL DAMAGES OF ANY KIND RELATING TO OR RESULTING FROM USE OF THE PERFORMANCE CALCULATOR.

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