Low Iron

| Make-up Name | Make-up Icon | Visible Light | | | | Ultraviolet | Solar Energy | | | Thermal Properties | Light to Solar Gain (LSG) |
| | | Transmittance | Reflectance | | Color Rendering Index (R_a) | Trans UV (τ_{uv} %) | Transmittance | Reflectance | Solar Heat Gain Coefficient (SHGC) | U-Value | |
		Visible (τ_v %)	ρ_v % out	ρ_v % in			Solar (τ_e %)	ρ_e % out		Winter Night (Btu/hr·ft²·F)	
Guardian UltraClear		91	9	9	99.8	86	90	8	0.90	1.025	1.01
Pilkington Optiwhite		91	8	8	99.7	85	90	8	0.90	1.024	1.01
Vitro Acuity		90	8	8	99.1	77	85	8	0.87	1.025	1.04
Vitro Starphire		91	8	8	99.7	87	89	8	0.90	1.025	1.01

Calculation Standard: NFRC 2010

Guardian UltraClear

Outdoors

GLASS 1	Guardian UltraClear® Glass (North America) Thickness = 1/4" (6mm)	#1 ----- #2 -----

Total Unit (Nominal) = 1/4 in   Slope = 90°   Window Height = 1 meter

Estimated Nominal Glazing Weight: 2.87 lb/ft²

Indoors

Pilkington Optiwhite

Outdoors

GLASS 1	Pilkington NSG Optiwhite™ (IGDB) Thickness = 1/4" (6mm)	#1 ----- #2 -----

Total Unit (Nominal) = 1/4 in   Slope = 90°   Window Height = 1 meter

Estimated Nominal Glazing Weight: 2.87 lb/ft²

Indoors

Vitro Acuity

Outdoors

GLASS 1	Vitro Acuity™ Glass (IGDB) Thickness = 1/4" (6mm)	#1 ----- #2 -----

Total Unit (Nominal) = 1/4 in   Slope = 90°   Window Height = 1 meter

Estimated Nominal Glazing Weight: 2.87 lb/ft²

Indoors

Vitro Starphire

Outdoors

| GLASS 1 | Vitro Starphire® glass (IGDB)
Thickness = 1/4" (6mm) | #1 -----
 #2 ----- |

Total Unit (Nominal) = 1/4 in   Slope = 90°   Window Height = 1 meter
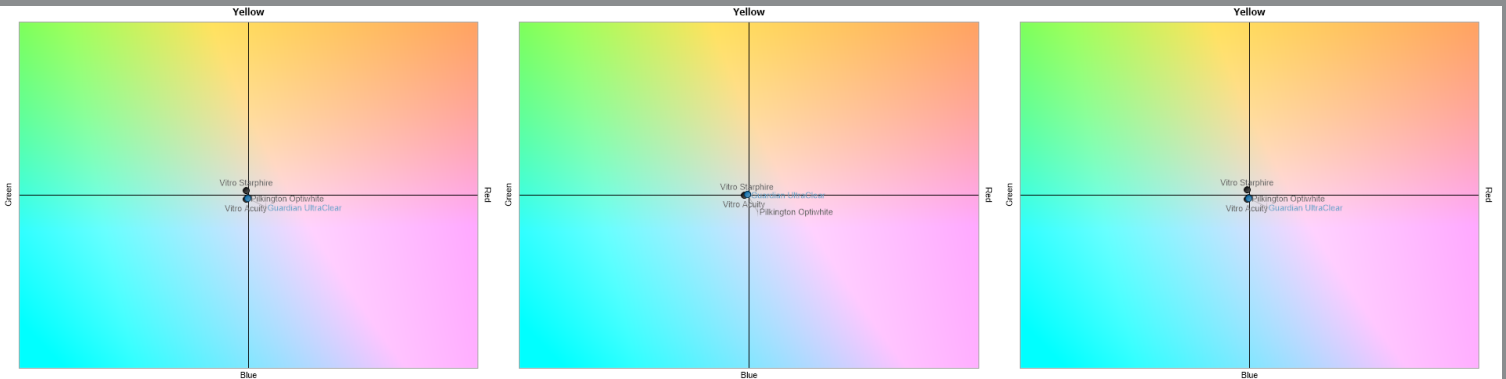
Estimated Nominal Glazing Weight: 2.87 lb/ft²

Indoors

Color Comparison Chart:

| **Outdoor Reflected Color** | **Transmitted Color** | **Indoor Reflected Color** |

Important Notes

Calculations and terms in this report are based on NFRC 2010. The performance values shown above represent nominal values for the center of glass with no spacer system or framing.

Laminated products:
The Performance Calculator allows the user to model a wide variety of laminated glass makeups using different float glass substrates, coatings and interlayer material, including those makeups where the coating faces the interlayer.   It is the user's responsibility to assess whether the laminated glass makeup meets relevant regional standards and complies with applicable laminated glass safety regulations.

In addition, when the laminated glass makeup includes a coating facing the interlayer material, there may be a loss of thermal insulation performance and a color change compared to non-embedded coated class.

Non-specular products (translucent or diffuse):
The performance measurement for non-specular (translucent or diffuse) materials such as translucent interlayers or acid etched glass surface, or surface with ceramic frit is limited by the current experimental technologies. Since measurements capture physically only a part of the resulting radiation, calculated performance results provided herein and based on such measurements are not compliant with any standard (including EN 410) and may only be used as a general reference. Actual values may vary significantly based upon exact fabrication process, as well as type, thickness and color of used non-specular material.

Please note that the Thermal Stress Guideline is only a general guide to the thermal safety of a glazing, and it is not a replacement for detailed thermal stress analysis.

Explanation of Terms

Visible Light Transmittance (Tv, %) is the percentage of incident light in the wavelength range of 380 nm to 780 nm that is transmitted by the glass.

Ultraviolet (UV) Transmittance (Tuv, %) is the percentage of the incident solar radiation transmitted by the glazing in the 300 nm to 380 nm range.

Solar Energy Direct Transmittance (Te, %) is the percentage of incident solar energy in the wavelength range of 300 nm to 2500 nm that is directly transmitted by the glass.

Visible Light Reflectance Outdoors/Indoor (Rv out/in, %) is the percentage of incident visible light directly reflected by the glass.

Solar Direct Reflectance Outdoors/Indoors (Re out/in, %) is the percentage of incident solar energy directly reflected by the glass.

Solar Energy Absorptance (Ae, %) is the percentage of the sun's energy that is absorbed by glass.

U-Value is the glazing parameter that characterizes the heat transfer through the central part of the glazing, i.e. without edge effects, and expresses the steady-state density of heat transfer rate per temperature difference between the environmental temperatures on each side. US Standard units are Btu/hr·ft²·F and SI / Metric units are W/m2 K.

Relative Heat Gain (RHG) is the total net heat gain to the indoors due to both the air-to-air thermal conductance and the solar heat gain. US Standard units are Btu/hr.ft² and SI / Metric units are W/m².

Shading Coefficient (sc) is Solar Factor divided by 0.87. It is a measure of the solar heat gain referenced to 3 mm clear glass which has the designated value of 1.00.

Solar Heat Gain Coefficient (SHGC) is the sum of the solar direct transmittance and the secondary heat transfer factor of the glazing towards the inside, the latter resulting from heat transfer by convection and longwave IR-radiation of that part of the incident solar radiation which has been absorbed by the glazing.

Light-to-Solar Gain (LSG) is the ratio of visible light gain to solar gain. LSG = (Visible Transmittance) / (SHGC)

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

Weighted Sound Reduction Index (Rw) is a single-number quantity which characterizes the airborne sound insulation of a material or building element over a range of frequencies.

Sound Transmission Class (STC) is a single-number quantity which characterizes the airborne sound insulation of a material or building element over a range of frequencies.

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 or CE Initial Type Testing and subject to variations due to manufacturing and calculation tolerances. Spectral data for products not manufactured by Guardian were derived from the LBNL International Glazing Database and have not been independently verified by Guardian. Guardian recommends a full-size mock-up be approved.

The values provided herein are generated according to established engineering practices and applicable calculation standards. Many factors may affect glazing characteristics, including glass size, building orientation, shading, wind speed, type of installation, production process 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 the responsibility of the users of the analysis to ensure that the intended application is appropriate and complies with all relevant laws, regulations, standards, codes of practices, processing guidelines and other requirements. Guardian makes no guarantee that any glazing modeled herein 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.

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Program Version: 4.1.0.9177
Database Version: 20210826