



## Guardian Total Performance Calculator

April 30, 2008  
Thermal 5.2.4

### OUTDOORS

Lite	Clear Thickness = 1/4" = 6 mm	#1 ----- #2 SunGuard® SuperNeutral 68
Gap	Air Space = 1/2" = 12 mm	
Lite	Clear Thickness = 1/4" = 6 mm	#3 40% White dots #4 -----
Total Unit = .942" = 23.9mm		Slope = 90°

### INDOORS

Visible Light		Solar Energy (Direct)		Winter	Summer				
				U-Factor	U-Factor	Shading Coef.	SHGC	Relative Heat Gain	
% Trans- mittance	% Reflectance		Night-time	Day-time					
		Indoor	Outdoor						
<b>50</b>	<b>21</b>	<b>21</b>	<b>24</b>	<b>36</b>	<b>.29</b>	<b>.28</b>	<b>.36</b>	<b>.318</b>	<b>77</b>

ASHRAE NFRC 2001

The performance values shown above represent NOMINAL VALUES for the center of glass (no spacer or framing). Slight variations may occur due to manufacturing tolerances, point of manufacture, and type of instrumentation used to measure the optical properties.

#### EXPLANATION OF NFRC 2001 STANDARD TERMS

**Visible Light** = radiant energy in the wavelength range of 380 nm to 780 nm with Ill. D65 and CIE 2° observer

% Transmittance = percentage of visible light at normal incidence (90° to surface) directly transmitted through the glass

% Reflectance Indoors = percentage of visible light at normal incidence directly reflected from the glass back indoors

% Reflectance Outdoors = percentage of visible light at normal incidence directly reflected from the glass back outdoors

**Solar Energy (Direct)** = radiant energy from the sun having a wavelength range of 300 nm to 2500 nm at ASTM air mass of 1.5

% Transmittance = percentage of solar energy at normal incidence (90° to surface) directly transmitted through the glass

Reflect % Out = percentage of solar energy at normal incidence directly reflected from the glass back outdoors

**U-Factor** = (also called U-Value) air-to-air thermal conductance of 39" high glazing and associated air films. Units are Btu/hr.ft².F.

Winter-night = 12.3 mph wind at -0.4°F & 69.8°F indoors. Summer = 0 sun, 6.15 mph wind at 89.6°F & 75.2°F still indoor air.

**Shading Coef.** = (SC) fraction of solar heat, direct (300 to 4500 nm) plus indirect (5 to 40 μm), transferred indoors through the glass. For reference, 1/8" (3.1 mm) clear glass has a value of 1.00 (SC is an older term being replaced by the SHGC).

**SHGC** = (Solar Heat Gain Coefficient) fraction of solar energy incident on the glazing that is transferred indoors both directly and indirectly through the glazing. The direct gain portion equals the direct solar transmittance, while the indirect is the fraction of the solar energy absorbed to the energy reradiated & convected indoors. No heat gain from warmer outdoor air is included.

SHGC = (Direct Solar Trans) + {[Indirect Solar Heat Gain] - (Summer U-Value)(89.6°F - 75.2°F)} / (248.209 Btu/hr.ft²)

**Relative Heat Gain (RHG)** = total net heat gain to the indoors due to both the air-to-air thermal conductance and the solar heat gain. The units are Btu/hr.ft². RHG = [(Summer U-Value)(89.6°F - 75.2°F) + (Shading Coef.)(200 Btu/hr.ft²)]

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