

PRODUCT DESCRIPTION

Sungate ThermL™ on Clear coated glass by Vitro Architectural Glass is a low-e coating engineered for use on the interior surface of a typical insulated glass unit (IGU) that dramatically improves U-values when paired with a Solarban® solar control low-e glass. Its colorless and non-reflective aesthetic gives it the same look and feel as clear glass.

APPROXIMATE WEIGHTS

Per m ²		Per ft ²	
thickness	weight	thickness	weight
6.0 mm	14.2 kg	1/4"	2.9 lbs.

MECHANICAL PROPERTIES

Knoop Hardness Number (indentation hardness) indenter load--500 gm	470 kgf/mm ²	
Poisson's Ratio	0.22	
Modulus of Elasticity (Young's)	73.1 GPa	10,600,000 psi
Tensile Strength (Determined as Modulus of Rupture, ultimate)	41.4 MPa	6,000 psi
Density at 21°C (70°F)	2.51 g/cm ³	157 lb/ft ³

COLOR

	6.0mm
Transmitted Color: D65, 10° L*	94.5
a*	-1.9
b*	0.3
Hue Angle (°)	171
Dominant wavelength: C, 2°	498 nm

THERMAL PROPERTIES

Hemispherical Emissivity at -18 to 66 °C (0 to 150°F)) glass / coating	0.84	
Expansion Coefficient (linear) 20 to 300°C (68 to 572°F)	8.7*10 ⁻⁶ / °C	4.8*10 ⁻⁶ / °F
Specific heat at 0 to 100°C (32 to 212°F)	858 J/kg-K	0.205 BTU/lb-°F
Thermal Conductivity (k) at 50°C (122°F)	0.937 W/m-K	0.542 Btu/hr-ft-°F
Softening Point	723°C	1333°F
Annealing Point	54°C	1011°F
Strain Point	504°C	939°F

CHEMICAL COMPOSITION

SiO ₂	73%
Na ₂ O	14%
CaO	9%
MgO and Trace elements	3%

HEAT TREATMENT GUIDELINES

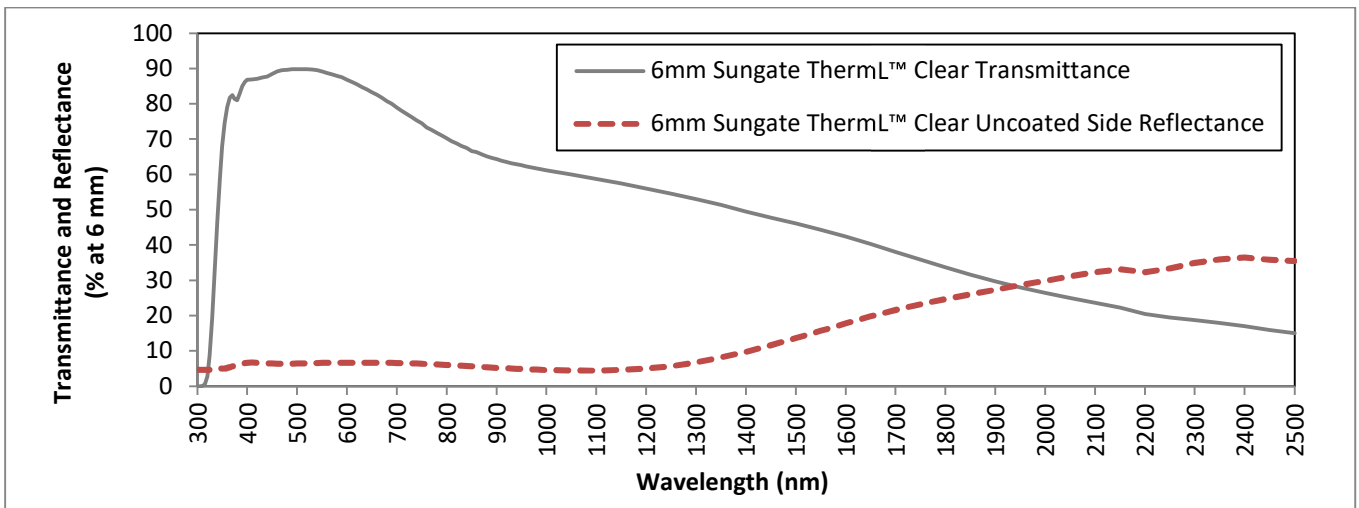
The coating on Sungate ThermL™ glass is permanent, allowing the glass to be heat treated to satisfy increased strength or safety glazing requirements. While heat treating Sungate ThermL™ coated glass, face the coating away from the furnace rolls to reduce the risk of introducing scratches to the coated surface. Process the glass the same as Solarban® coated glass. Glass heat cycle time will be reduced as compared to Solarban® solar control low-e glass. **Turn off SO₂ in the furnace.** SO₂ may cause an appreciable loss in durability of the Sungate ThermL™ coating. Degradation is the result of the SO₂ reducing the atmosphere causing potential damage to the coating.

SOLAR PERFORMANCE VALUES COATED SURFACE ^[4]

Glass Thickness		Transmittance				Reflectance	
inches	mm	Ultra-violet (%)	Visible (%)	Infrared (%)	Total Solar (%)	Visible (%)	Total Solar (%)
1/4	6.0	63	88	0	70	6	9

^[4] Figures may vary due to manufacturing tolerances. All tabulated solar performance data are based on the methodology prescribed in ISO 9050, 2003 except Infrared, which is based on the solar irradiance data prescribed by ISO 9050, 2003 from 780 to 2500 nm. Slight changes in transmitted optical properties may occur on exposure to sunlight.

Wave-length (nm)	%T	%R	Wave-length (nm)	%T	%R	Wave-length (nm)	%T	%R	Wave-length (nm)	%T	%R	Wave-length (nm)	%T	%R
300	0.0	4.7	420	85.1	7.7	640	82.5	7.3	860	64.9	5.4	1400	40.4	15.3
305	0.0	4.7	430	85.2	7.8	650	81.7	7.3	870	64.2	5.3	1450	38.5	17.9
310	0.1	4.7	440	85.4	7.8	660	81.0	7.3	880	63.7	5.3	1500	36.6	20.6
315	0.6	4.7	450	85.9	7.9	670	80.2	7.2	890	63.1	5.2	1550	34.7	23.3
320	3.0	4.7	460	86.6	7.9	680	79.2	7.2	900	62.7	5.1	1600	32.6	25.9
325	9.4	4.7	470	86.9	8.0	690	78.5	7.1	910	62.2	5.0	1650	30.6	28.2
330	20.6	4.7	480	87.1	7.9	700	77.4	7.0	920	61.7	5.0	1700	28.5	30.1
335	34.4	4.8	490	87.3	7.9	710	76.6	7.0	930	61.3	4.9	1750	26.5	31.8
340	47.9	5.1	500	87.4	7.9	720	75.7	6.9	940	60.9	4.9	1800	24.6	33.1
345	59.3	5.4	510	87.5	7.9	730	74.7	6.8	950	60.5	4.8	1850	22.8	34.2
350	67.9	5.8	520	87.6	7.8	740	74.0	6.7	960	60.0	4.8	1900	21.2	35.3
355	74.0	6.1	530	87.5	7.8	750	73.1	6.6	970	59.6	4.8	1950	19.9	36.4
360	78.1	6.4	540	87.4	7.7	760	72.1	6.5	980	59.2	4.8	2000	18.6	37.4
365	80.3	6.6	550	87.2	7.7	770	71.2	6.4	990	58.8	4.8	2050	17.5	38.5
370	81.0	6.8	560	86.9	7.6	780	70.4	6.3	1000	58.4	4.8	2100	16.4	39.5
375	79.9	6.9	570	86.6	7.6	790	69.6	6.2	1050	56.3	5.0	2150	15.4	39.9
380	79.5	7.0	580	86.2	7.5	800	68.9	6.1	1100	54.2	5.5	2200	14.0	38.5
385	81.3	7.2	590	85.8	7.5	810	68.2	6.0	1150	52.0	6.3	2250	13.3	39.4
390	83.3	7.4	600	85.1	7.4	820	67.4	5.8	1200	49.6	7.6	2300	12.8	40.9
395	84.4	7.5	610	84.6	7.4	830	66.7	5.7	1250	47.3	9.2	2350	12.2	41.8
400	85.0	7.6	620	83.9	7.4	840	66.2	5.6	1300	45.0	11.0	2400	11.5	42.1
410	85.1	7.7	630	83.2	7.4	850	65.3	5.5	1350	42.7	13.1	2450	10.7	41.0
												2500	10.0	40.3



ADDITIONAL INFORMATION/DOCUMENTS

The following documents can be referenced for additional information regarding *Sungate ThermL™* glass.

Sungate ThermL™ Performance Data, Vitro *Sungate ThermL™* Coated Glass Warranty, Vitro MSVD Coated Glass SDS, TD-150

Note: Use of *Sungate ThermL™* coated glass in Silicone Structural Glazing (SSG) applications is only possible with the approval of the relevant SSG project principals and evaluations are required on an individual project basis