

Solar TCO for Thin-Film PV

solar



PRODUCT DESCRIPTION

Solar TCO glass is a soda-lime float glass with a transparent tin oxide coating specifically designed for use with thin-film photovoltaic cells to provide heightened transmittance and improved conductivity properties. In 3.2 mm thickness, light transmittance is 84.5% and the haze is <0.7% as measured with a haze meter. The sheet resistance for this coating is 11.5 Ω/\square .

APPROXIMATE WEIGHTS

Per m ²		Per ft ²	
thickness	weight	thickness	weight
3.2mm	8.2kg	1/8"	1.7lbs
4mm	9.8kg	5/32"	2.0lbs

ELECTRIC PROPERTIES

Dielectric Constant (measured at 1 MHz)	5.7
Coated Surface Resistivity	11.5 ohms/sq.

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	6000 psi
Density at 21°C (70°F)	2.50 g/cm ³	157 lb/ft ³

THERMAL PROPERTIES

Hemispherical Emissivity at -18 to 66°C (0 to 150°F) glass/coating	0.84/0.15	
Expansion Coefficient (linear) 20 to 300°C (68 to 572°F)	8.7*10 ⁻⁶ /°C	4.9*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)	1.00 W/m-K	0.58 BTU/hr-ft-°F
Softening Point	724°C	1335°F
Annealing Point	550°C	1022°F
Strain Point	513°C	955°F
Transformation Temperature (T _g)	552°C	1026°F
Yield Point (A _t), (intenerate temperature)	606°C	1123°F

COLOR

Transmitted Color at 3.2mm; D65, 10	L*	92.7
	a*	0.01
	b*	0.01
Dominant wavelength	575 nm	

Figures in tables may vary due to manufacturing tolerances.

CHEMICAL PROPERTIES

SiO ₂	73%
Na ₂ O	14%
CaO	10%
MgO and Trace Elements	3%



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SOLAR PERFORMANCE VALUES

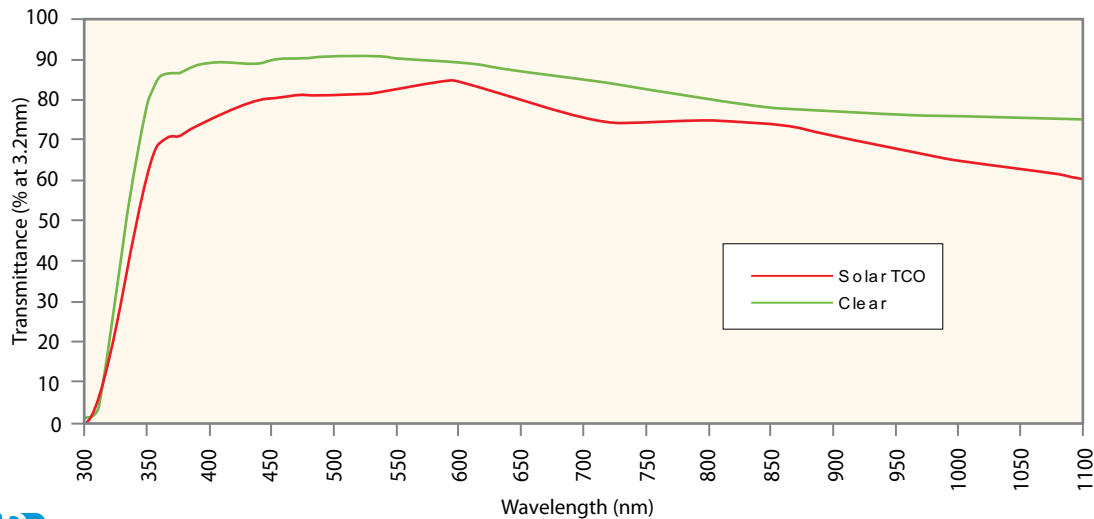
Glass Thickness		Transmittance						Coated Side Reflectance		
inches	mm	Ultra-violet (%)	Visible (%)	Infrared (%)	Total Solar (%)	PV Range Solar (%)	Haze (%)	Visible (%)	Total Solar (%)	PV Range Solar (%)
1/8	3.2	56	82	59	68	76	<0.7	11	12	10
5/32	4	54	82	57	67	75	<0.7	11	12	10

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 P. Moon solar irradiance, 800-2100 nm, PV Range, which is based on solar irradiance data in ISO 9050, 2003, 400-1100 nm. % haze is measured with a BYK Gardner Hazemeter. Slight changes in transmitted optical properties may occur on exposure to sunlight.

TRANSMITTANCE (% AT 3.2MM/0.125")

Wavelength (nm)	Clear	Solar TCO	Wavelength (nm)	Clear	Solar TCO	Wavelength (nm)	Clear	Solar TCO
300	0.2	0.3	700	85.1	75.7	1550	82.3	34.5
320	13.7	9.5	720	84.1	74.9	1600	83.1	29.5
340	65.5	48.1	740	83.1	74.6	1650	83.6	25.1
360	85.5	68.3	760	82.1	74.6	1700	83.9	21.5
380	86.0	70.3	780	81.1	74.8	1750	84.0	18.4
400	89.3	75.1	800	80.2	74.9	1800	83.8	15.8
420	89.2	77.7	850	78.2	73.8	1850	83.4	13.6
440	89.4	79.1	900	76.8	70.9	1900	83.2	11.7
460	90.0	80.5	950	76.1	67.5	1950	83.2	10.1
480	90.4	81.1	1000	75.5	64.4	2000	83.2	8.8
500	90.5	81.1	1050	75.2	62.0	2050	83.2	7.7
520	90.5	81.3	1100	75.1	60.3	2100	83.3	6.8
540	90.3	81.9	1150	75.3	59.1	2150	83.1	6.0
560	90.0	83.0	1200	75.6	57.9	2200	81.9	5.3
580	89.6	84.1	1250	76.1	56.5	2250	81.8	4.7
600	89.2	84.2	1300	76.9	54.7	2300	82.4	4.3
620	88.5	83.0	1350	77.8	52.2	2350	82.6	3.9
640	87.8	81.1	1400	78.8	48.8	2400	82.4	3.6
660	86.9	78.9	1450	80.1	44.7	2450	81.7	3.3
680	86.0	77.0	1500	81.3	39.8	2500	80.9	2.9

SPECTRAL CURVE CHART



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SOLAR-3 (3/09)