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**Product Description:** STARPHIRE glass is an ultra-clear soda-lime float glass product. Its high visible light transmittance (>91% at 6 mm) and its brilliant azure edge are two characteristics unique to STARPHIRE glass. This glass is a low iron composition with mechanical and physical properties similar to ordinary clear soda-lime float glass.<sup>1</sup>

**Mechanical Properties**

Knoop Hardness Number (indentation hardness) indenter load--500 gm	470 kgf/mm <sup>2</sup>	
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)	2.51 g/cm <sup>3</sup>	157 lb/ft <sup>3</sup>

**Thermal Properties**

Hemispherical Emissivity at -18 to 66 °C (0 to 150°F)	0.84	
Expansion Coefficient (linear) 20 to 300°C (68 to 572°F)	9.28*10 <sup>-6</sup> / °C	5.16*10 <sup>-6</sup> / °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	710°C	1310°F
Annealing Point	547°C	1017°F
Strain Point	513°C	955°F
Transformation temperature (Tg)	556°C	1033°F
Yield point (At), (intenerate temperature)	606°C	1123°F

**Chemical Properties**

SiO <sub>2</sub>	73%
Na <sub>2</sub> O	15
CaO	11
Trace elements	1

**Electric Properties**

Dielectric Constant (measured at 1 MHz)	5.7
Surface Resistivity	106-108 ohms/sq.

**Refractive Indices and Color**

Refractive indices: nF	486.1 nm	1.5245 +/- 0.0005
nD	589.3 nm	1.5183 +/- 0.0005
nC	656.3 nm	1.5158 +/- 0.0005
Abbe number (nD-1)/(nF-nC)	60	
Color at 6 mm : D65, 10 L*	96.5	
a*	-0.24	
b*	0.10	
Dominant wavelength	500 nm	

**Approximate weights**

Per m <sup>2</sup>		Per ft <sup>2</sup>	
thickness	weight	thickness	weight
3.3 mm	8.2 kg	1/8"	1.7 lbs
4 mm	9.9 kg	5/32"	2.0 lbs
5 mm	11.9 kg	3/16"	2.4 lbs
6 mm	14.2 kg	1/4"	2.9 lbs
8 mm	19.8 kg	5/16"	4.1 lbs
10 mm	23.8 kg	3/8"	4.9 lbs
12 mm	31.8 kg	1/2"	6.5 lbs

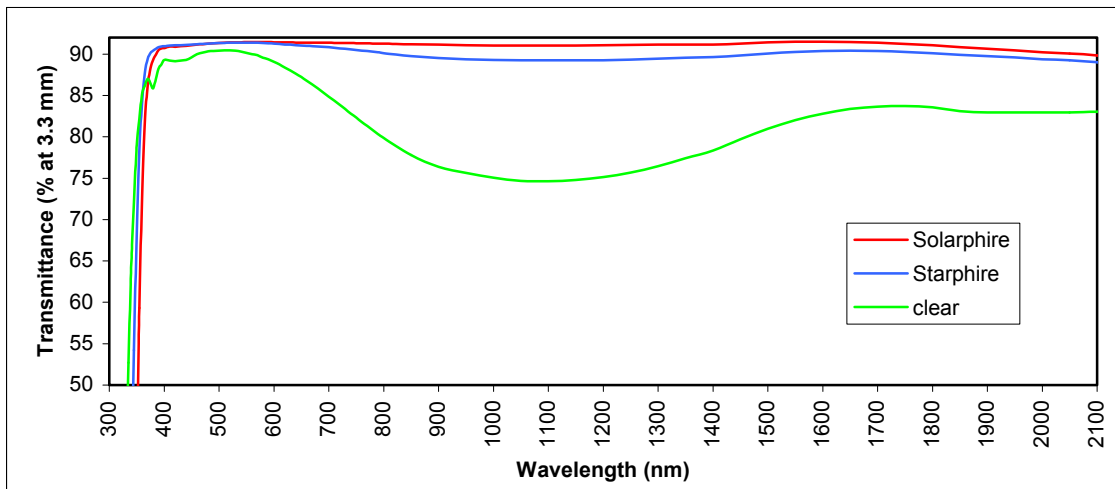
<sup>1</sup> Figures in tables may vary due to manufacturing tolerances.

Visible and Glazing Performance<sup>2</sup>

Glass Thickness		Transmittance				Reflectance		U-value BTU/hr-ft <sup>2</sup>		K-value W/hr-m <sup>2</sup>		Shading coefficient	Solar Heat Gain Coefficient
inches	mm	Ultra-violet (%)	Visible (%)	Infrared (%)	Visible (%)	Visible (%)	Visible (%)	Winter	Summer	Winter	Summer		
1/8	3.3	65	91	90	90	8	8	1.04	0.94	5.9	5.3	1.04	0.91
5/32	4	63	91	89	90	8	8	1.04	0.93	5.9	5.3	1.04	0.90
3/16	5	60	91	88	89	8	8	1.03	0.93	5.9	5.3	1.04	0.90
1/4	6	58	91	87	89	8	8	1.03	0.93	5.8	5.3	1.03	0.90
5/16	8	54	91	86	88	8	8	1.01	0.91	5.7	5.2	1.03	0.89
3/8	10	52	91	85	87	8	8	1.01	0.91	5.7	5.1	1.02	0.89
1/2	12	49	90	83	86	8	8	1.00	0.91	5.6	5.1	1.01	0.88

Transmittance (% at 3.3 mm/0.129")

Wave-length (nm)	clear	Star-phire	Solar-phire	Wave-length (nm)	clear	Star-phire	Solar-phire	Wave-length (nm)	clear	Star-phire	Solar-phire
300	0.2	0.0	0.0	590	89.4	91.3	91.5	1250	75.7	89.3	91.1
310	1.2	0.1	0.0	610	88.7	91.2	91.4	1300	76.4	89.4	91.2
320	12.9	0.2	0.0	630	88.0	91.1	91.4	1350	77.4	89.6	91.1
330	39.9	12.6	0.7	650	87.2	91.0	91.4	1400	78.4	89.6	91.2
340	64.8	38.3	10.1	670	86.3	91.0	91.4	1450	79.7	89.8	91.3
350	79.0	68.4	40.7	690	85.4	90.9	91.4	1500	81.0	90.1	91.4
360	85.3	84.4	73.3	710	84.4	90.8	91.4	1550	82.0	90.3	91.5
370	87.0	89.4	86.2	730	83.4	90.6	91.3	1600	82.8	90.4	91.5
380	85.8	90.4	89.3	750	82.3	90.5	91.3	1650	83.4	90.4	91.5
390	88.3	90.8	90.5	770	81.3	90.4	91.3	1700	83.6	90.4	91.4
410	89.2	91.0	90.9	800	79.8	90.1	91.2	1750	83.7	90.3	91.2
430	89.2	91.1	91.0	850	77.8	89.8	91.2	1800	83.6	90.1	91.1
450	89.6	91.2	91.1	900	76.4	89.5	91.1	1850	83.1	89.9	90.9
470	90.2	91.2	91.2	950	75.6	89.4	91.1	1900	83.0	89.8	90.7
490	90.4	91.3	91.3	1000	75.1	89.3	91.0	1950	83.0	89.6	90.4
510	90.4	91.4	91.4	1050	74.7	89.2	91.0	2000	82.9	89.4	90.2
530	90.4	91.4	91.4	1100	74.6	89.2	91.0	2050	83.0	89.2	90.1
550	90.1	91.4	91.5	1150	74.8	89.2	91.0	2100	83.0	89.0	89.8
570	89.9	91.4	91.5	1200	75.1	89.3	91.1	2150	82.8	88.7	89.4



<sup>2</sup> Figures may vary due to manufacturing tolerances. All tabulated glazing performance data are based on NFRC methodology using LBL Window 5.2 software. Some variations from previously published data are due to minor changes in the LBL Window 5.2 software versus Version 4.1. Slight changes in transmitted optical properties may occur on exposure to sunlight.