

Soda Lime Glass

Soda lime glass is often referred to as float glass because it is formed by drawing glass over molten tin baths. Composition- Alkali / alkaline-earth Silicate Glasses (usually about 12-16% alkali (Na_2O), 8-16% alkaline earths ($\text{CaO} + \text{MgO}$), 0-2% Al_2O_3 and about 71-75% SiO_2).

General Chemical Composition:

Silicon dioxide (SiO_2) 69-74%

Calcium oxide (CaO) 5-12%

Sodium oxide (Na_2O) 12-16%

Magnesium oxide (MgO) 0-6%

Aluminum oxide (Al_2O_3) 0-3%

Trace amounts of impurities which include Fe_2O_3 (iron oxide) which gives soda lime glass its greenish tint

Composition varies seasonally (time of year glass is made) and location (which plant glass is made)

Mechanical and Thermal Properties:

Specific Weight: $2,483 \text{ g/cm}^3$

Hardness (Moh's Scale): 6-7

Density: 2.44 g/cm^3

Poisson's Ratio: 0.22

Modulus of Elasticity (Young's): $7.2 \times 10^{10} \text{ Pa}$

Modulus of Rigidity (Shear): $3.0 \times 10^{10} \text{ Pa}$

Bulk Modulus: $4.3 \times 10^{10} \text{ Pa}$

Thermal Coefficient of Expansion (0/300°C): $8.6 \times 10^{-6} / ^\circ\text{C}$

Softening Point: 726°C/1340°F

Annealing Point: 546°C/1015°F

Strain Point: 514°C/957°F

Optical Properties:

Index of Refraction: 1.523 @ 435nm

1.513 @ 645nm

Chemical Properties:

Hydrolytic resistance: Class 3. Not as chemically resistant as borofloat or Bk-7

Special Properties:

Less expensive than either borofloat or Bk-7. Soda lime glass can be fully tempered whereas borofloat cannot. Soda lime has a slight greenish tint due to its iron content.