

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 g/cm³

Hardness (Moh's Scale): 6-7

Density: 2.44 g/cm³

Poisson's Ratio: 0.22

Modulus of Elasticity (Young's): 7.2 x 10¹⁰ Pa

Modulus of Rigidity (Shear): 3.0 x 10¹⁰ Pa

Bulk Modulus: 4.3 x 10¹⁰ Pa

Thermal Coefficient of Expansion (0/300°C): 8.6 x 10⁻⁶/°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®33 or N-BK7

Special Properties:

Less expensive than either Borofloat®33 or Bk-7. Soda-lime glass can be fully tempered whereas Borofloat®33 cannot. Soda-lime has a slight greenish tint due to its iron content.