



## Glass physical properties

General physical characteristics of soda, lime, silica glass for building purposes

- ◆ Density – 2500 kg/m<sup>3</sup>
- ◆ Specific gravity – 2.5 at 21°C
- ◆ Coefficient of linear thermal expansion –  $88 \times 10^{-7}/^{\circ}\text{C}$ . Glass has a much lower coefficient of linear thermal expansion than most metals
- ◆ Thermal conductivity – (K value) 1.05W/m°C. The difference between various types of flat glass is small enough to be negligible
- ◆ Thermal endurance – 6mm glass heated to a higher temperature and plunged into water at 21°C will rupture at approximately 55°C differential. Toughened 250°C differential
- ◆ Softening point – 737°C
- ◆ Annealing range – 480°C to 560°C
- ◆ Strain point – 523°C
- ◆ Mean specific heat – 1162 J/kg°C (25°C to 850°C)
- ◆ Modulus of elasticity –  $73 \pm 1 \times 10^9$  Pa (High Frequency Resonance at 20°C)
- ◆ Poisson's ratio float glass – 0.22 to 0.33  
Glass conforms to the elastic theory to the point of fracture
- ◆ Compressive strength – 25mm cube: of the order of 248 Mpa (not to be used for design purposes, refer to local standards for glass design)
- ◆ Tensile strength – for sustained loading 19.3 to 28.4 Mpa. Determined as modulus of rupture (glass strength is highly variable so this information is not to be used for design purposes. Refer to local standards for glass design)
- ◆ Impact strength – highly variable depending on shape, hardness and velocity of impacting object. Establish performance by specific testing
- ◆ Hardness scale – Moh's scale 5.5 to 6.5. Knoop hardness 575
- ◆ Dielectric constant – 6mm glass at 21°C temperature

1,000,000,000	cycles per sec	6.0
10,000,000	cycles per sec	6.5
1,000	cycles per sec	7.4
10	cycles per sec	30.0
- ◆ Volume electrical resistivity –  $31 \times 10^{11} \Omega\text{m}$
- ◆ Refractive index – 1.52 (at 590 nanometers). Refractive index varies for light of different wavelengths
- ◆ Thermal conductive (U Value) – 5.9 W/m<sup>2</sup>°K 6mm glass. Determined under AFRC 100-2001 environmental conditions (varies slightly with thickness)
- ◆ Visible light transmission – 87% 6mm Clear Float glass. Varies with glass thickness and type
- ◆ Infra-red transmission – relatively transparent to short wave infra-red but opaque to long wave infra-red (varies with glass type and thickness)
- ◆ Ultraviolet transmission – float glass transmits very little in the short wave length of the ultraviolet band but transmission increases as the boundary with the visible spectrum is approached (transmission varies with glass type and thickness)
- ◆ Chemical resistance – glass will resist most acids except hydrofluoric and at high temperatures, phosphoric. Alkalis will attack the surface of glass. Water born materials from surrounding surfaces may leave deposits on the glass. These should be removed as soon as possible



### Did you know?

Viridian's founding glass company opened its first office in Australasia in 1879.