GLAVERBEL SODALIME GLASS

MATERIAL

CHEMICAL ANALYSIS

Typical float glass composition in % of weight is:

SiO2	Na2O	K2O	CaO	MgO	Al2O3	SO3
70.8	13.9	0.4	8.2	4.4	1.9	0.3

MECHANICAL PROPERTIES

- Specific weight : 2.49 0.01 103 K/m3
- Young's Modulus : E= 702 G.Pascals or GN/m2
- Poisson's ratio : 0.230.01
- Hardness:
  - Vickers scale: 6.35 G Pascals or G N/m2
  - Moh's scale: 6.50.5 (between orthoclase and quartz)

THERMAL PROPERTIES (General tolerances 10 °C)

In discussing the thermal behaviour of glass,the melting point is not a characteristic temperature so as for crystalline substances;various empirically defined temperatures and particular points on the viscosity/temperature curves,have been proposed to replace this important constant.

Annealing range

To prevent strain in the glass,exact control of temperature is important d uring processing and especially during an interval the annealing range between 480 and 585 °C .Above the upper part of the annealing range,the glass is so fluid that it yields practically instantaneously to stress,and a stress cannot persist

Strain Point

The strain point is the temperature from which a piece of glass can be more quickly cooled without introducing permanent strain.The strain point is 490 °C with a corresponding viscosity of $10^{14.5}$poises.

Transformation point:Tg

The transformation point is the temperature at which a sudden change in the coefficient of extension takes place;the change can be located with fair precision and is a characteristic temperature for a given glass composition.The Tg of Vertec is about 555 °C with a viscosity of $10^{13.4}$poises.

Softening point

The softening point,corresponding to a viscosity $10^{7.6}$poises, is the maximum point reached on the complete thermal expansion curve for glass.The softening point of Vertec is about 585°C.

Mean linear coefficient of thermal expansion

measured with the dilatometer.This value expresses the expansivity of the material;it is the increase in length of the specimen devided by the original length when heated over the considered temperature interval.

0 to 100 °C: 8.00.2 10-6 per °C or °K
0 to 200 °C: 8.1
0 to 300 °C: 8.4
0 to 400 °C: 8.7
0 to 500 °C: 9.0
A typical value used is $8.5x10^{-6}$ per °C or °K

Specific heat

1.10^{3}J/Kg*K

Thermal conductivity

at 20 °C:0.95 0.05 W m-1 K

CHEMICAL PROPERTIES

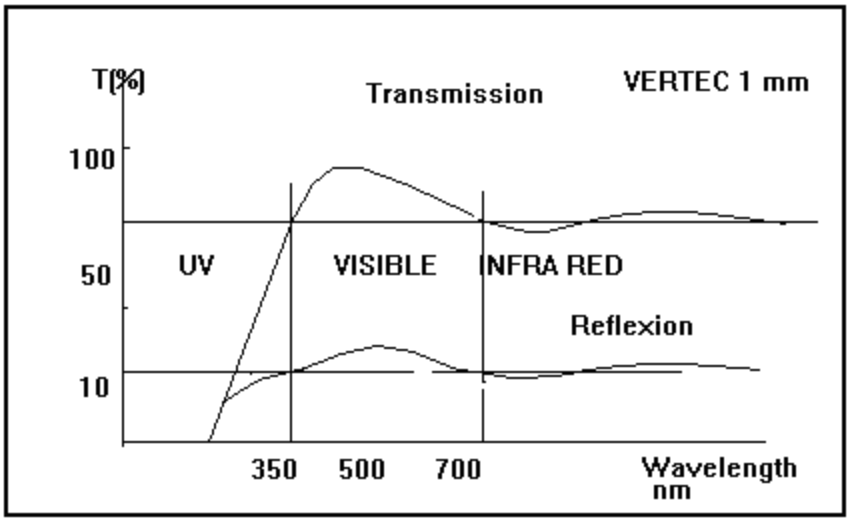
Hydrolytic class

- according to standard DIN 12.111 :class 3
- according to standard ISO 719 :class 3

Once installed for use,glass can withstand large amount of water without significant surface damage.However,water accumulated between lites in storage,even if only small amount is trapped,can cause surface deterioration.Storage areas for glass should be maintained at degrees of temperature and humidity that will prevent water vapor deposition on the glass.Waters and chemicals should not be allowed to harden on glass surfaces because it is always difficult to remove the residue after a too long time.

One can advise:

Relative humidity HR<= 60% ideally 40%
Temperature T<=20°C ideally 15°C
Temp variation T<=5°

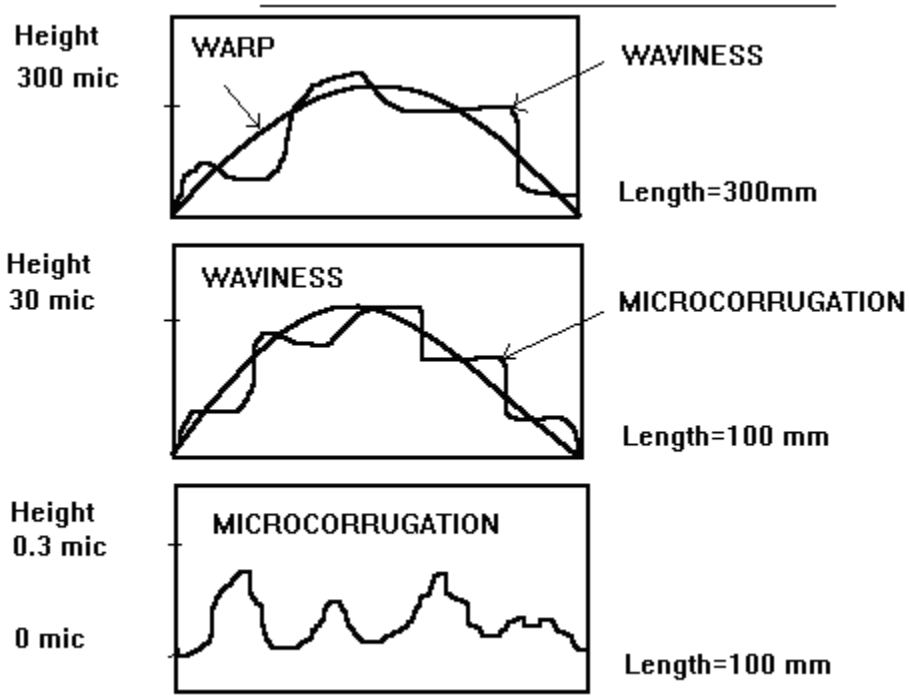


Vertec thick=1mm
- Refractive index n = 1.520.005 in visible range
- Reflexion for one face $=(n-1/n+1)^2$ with =0.04 for n=1.5 i.e. reflection is about 8% for the 2 faces of one sheet of glass
Example: Light (375-700 nm) -thickness 1 mm
Reflection 8.1%
Absorption 0.8%
Transmission 91.1%

ELECTRICAL PROPERTIES

- Specific resistivity
(at 1000 Hz)
log R ohms cm 25°C = 9.7
100°C = 9.1
250°C = 6.5
(at 65 Hz)
25°C = 11
- Dielectric constant at 25°C/1MHz=7.75

FLATNESS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