Schott AF 45 Borosilicate Glass

Glass and Polymer Technologies

AF 45 is a modified borosilicate glass with a high content of BaO and Al2O3. It is an alkali-free borosilicate that offers freedom from alkali leaching in critical coating and electrical applications.

Main AF 45 Characteristics

- Alkali-free
- Low Coefficient of Expansion, excellent thermal resistance
- High luminous transmission
- Excellent flatness
- Fire-polished surfaces

Dimensions

- Maximum dimensions: 440 mm (17.32") by 360 mm (14.17")
- Thicknesses: 0.05 mm to 1.9 mm, not all thicknesses are available from stock

Thermal Properties

- Coefficient of Thermal Expansion (Static Measurement, 20-300° C.) 4.5 x 10-6 °K

Viscosity Temperature, Designation log _ [dPas] [° C]

- Strain Point 627
- Annealing Point 663
- Softening Point 883
- Transformation Temperature 662

Optical Properties

Refractive Index
n 1.5359
Abbe Value ve 62.2

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Mechanical Properties

Density _ (annealed @ 40° C/h) 2.72 (g/cm3)
Stress Optical Coefficient C 3.2 (1.02 x 10-12 m2/N)
Young's Modulus E 66.0 (kN/mm2)
Poisson's Ratio _ 0.235
Torsion Modulus G 26.7 (kN/mm2)
Knoop Hardness HK100 555

Chemical Properties

- Hydrolytic Resistance according to DIN ISO 719, Hydrolytic Class HGB 1
- Equivalent Alkali (Na2O) per gram of glass grains 6.8 (_g/g)
- Acid Resistance according to DIN 12116, Class 4, Half surface weight loss after 6 hours >250 (mg/dm2)
- Acid Resistance according to DIN ISO 695, Class A 3, Surface weight loss after 3 hours 460 (mg/dm2)

Electrical Properties

Dielectric Constant (Permissivity) Er 6.2 (@ 1 MHz)
Dissipation Factor tan _ 9 x 10-4 (@ 1 MHz)
Electrical Volume Resistivity _D (DC)
@ _ = 250° C 6 X 1013 (_ cm);
@ _ = 350° C 3.2 X 1011 (_ cm);
@ _ = 500° C 1.6 X 109 (_ cm)
Temperature tK100 for specific electrical volume resistivity @ 108 _ cm 610°

Sources: information, data and texts origin from publicly available homepages of universities, glass fabricators etc.