

Specialty Glass Products Technical Reference Document

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Borosilicate

SCHOTT Borofloat® 33 - Multi-Functional Float Glass

Description

SCHOTT Borofloat® 33 is a versatile borosilicate glass with excellent light transmission, thermal properties, and chemical resistance. Its unique properties make it desirable in many different applications, from high temperature lighting windows, view ports in extreme conditions, to the medical and semiconductor industry. Borofloat wafers are an excellent substrate for MEMS (micro-electro-mechanical systems), as its coefficient of thermal expansion is very similar to silicon and allows for anodic bonding between the two. The low density of Borofloat also makes it an excellent choice for lighter weight laminated glass systems (bulletproof glass).

Features

- Excellent flatness and surface quality
- Very good optical properties
- Low thermal expansion
- High chemical durability
- Low density

Applications

- High temperature windows for lighting
- Photovoltaics
- Optical windows, filters, and mirrors
- MEMS devices
- Chemically resistant view ports
- Bulletproof glass systems

Physical Properties

Mechanical

- | | | |
|---------------------------------------|-----------------------|----------------------------|
| • Density (25°C) ρ | 2.2 g/cm ³ | 137.3 lb/ft ³ |
| • Young's Modulus E | 64 kN/mm ² | 9.28 Mpsi |
| • Poisson's Ratio μ | 0.2 | |
| • Knoop Hardness HK _{0.1/20} | 480 | |
| • Bending strength σ | 25 MPa | 3.63 x 10 ³ psi |

Viscosity

- | | | |
|--|---------|---------|
| • Working Point (10 ⁴ poises) | 1270 °C | 2318 °F |
| • Softening Point (10 ^{7.6} poises) | 820 °C | 1508 °F |
| • Annealing Point (10 ¹³ poises) | 560 °C | 1040 °F |
| • Strain Point (10 ^{14.5} poises) | 518 °C | 964 °F |

Thermal Expansion

- 0 – 300 °C (32 – 572 °F) 3.25 x 10⁻⁶/K

Optical

- | | | |
|-------------------------|---------|--------|
| • Index of Refraction @ | 435.8nm | 1.4802 |
| | 479.9nm | 1.4768 |
| | 546.1nm | 1.4731 |
| | 589.3nm | 1.4713 |
| | 643.8nm | 1.4695 |
| | 656.3nm | 1.4692 |

Electrical

- Log₁₀ Volume Resistivity: (250°C, 482°F) 8.0
- (350°C, 932°F) 6.5

Dimensions

- Thicknesses: 0.7mm – 25.4mm
- Sizes: Up to 90" x 67"

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SCHOTT Borofloat® 33 - Multi-Functional Float Glass (cont.)

