SCHOTT

SCHOTT BOROFLOAT® glass - Floated Borosilicate Glass

BOROFLOAT® glass, a floated borosilicate glass, made by SCHOTT is recognized for its outstanding material properties in a wide range of applications. The micro-float technology utilized to produce BOROFLOAT® glass ensures a homogenous material with superior, mirror-like surfaces. Some of its other benefits include:

- Three times the thermal shock resistance of soda lime glasses along with a thermal expansion comparable to that of silicon.
- Excellent chemical resistance.
- Low density (approx. 10 % less than soda lime glass)
- Large sheet size and wide thickness spectrum

BOROFLOAT® glass is used wherever low thermal expansion, high transmission, excellent clarity and ruggedness are primary concerns. Even over long periods of time and at high temperatures, BOROFLOAT® glass exceeds the chemical resistance of most metals and other materials.

Chemical Data

• Hydrolytic Resistance	(ISO-719-HGB)	1
• Hydrolytic Resistance	(ISO 720-HGA)	1
• Acid Resistance	(ISO 1776)	1
• Alkali Resistance	(ISO 695-A)	2

Mechanical Properties

- Density (@ 25°C/77°F) — 2.23 g/cm³
- Modulus of Elasticity — 64 kN/mm²
- Knoop Hardness HK 0.1/20 (according to E DIN/ISO 9385) — 480
- Poisson's Ratio — 0.2
- Bending Strength (in accordance to DIN 1288, part 5, surfaces in practical use condition, abraded with 220 grid sandpaper)
  For Normal Conditions: ≤ 30 MPa (4351 psi)
  For Safety Conditions: ≤ 7 MPa (1015 psi)

Physical Impact

The resistance of BOROFLOAT® glass to physical impact depends on the type of installation, the size and thickness of the glass panel, the type of physical impact, in addition to other parameters.

Electrical Properties

- Dielectric Constant (@ 1 MHz & 25°C) — 4.6
- Loss Tangent (@ 1 MHz & 25°C) — 37×10^{-4}
- Dielectric Strength (@ 50 Hz & 25°C) — 16 kV/mm
- Specific Volume Resistance in Ω cm
  log ρ @ 250°C — 8.0
  log ρ @ 350°C — 6.5

Optical Properties

- Refractive Index (n_d) — 1.472
- Dispersion ($n_F - n_C$) — 71.9×10^{-4}

Thermal Properties

- Linear Thermal Coefficient of Expansion α (20-300°C/ 68-572°F) — 3.25×10^{-6}/K
- Transformation Temperature T_g — 525°C/977°F
- Annealing Point (10^{13} dPa·s) — 560°C/1040°F
- Softening Point ($10^{7.6}$ dPa·s) — 825°C/1517°F
- Thermal Conductivity k
  @ 90°C — 1.2 W/(m·K)
- Mean Specific Thermal Capacity c_p
  20-100°C — 0.83 kJ/(kg·K)
- Maximum Operating Temperature (Considering RTD[1])
  Short term — 500°C/932°F
  Long term — 450°C/842°F
- Resistance to Temperature Differences (RTD[1])
  Short term exposure
  (1 hour) — 110K/198°R
  (1-100 hours) — 90K/162°R
  Long term exposure
  (>100 hours) — 80K/144°R
- Resistance to Thermal Shock (RTS[2])
  Thickness <4 mm — 175K/315°R
  Thickness 4-6 mm — 160K/288°R
  Thickness 6-15 mm — 150K/270°R
  Thickness >15 mm — 140K/252°R

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Sheet Sizes and Tolerances

1150 x 850 mm^2 (45.3 x 33.5 $in.^2$) [0.7 - 25.4 mm]
1700 x 1300 mm^2 (66.9 x 51.2 $in.^2$) [16 - 21 mm]
2300 x 1700 mm^2 (90.5 x 66.9 $in.^2$) [3.3 - 15 mm]
Tolerance for stock sizes: ± 2.0 mm

Standard Thickness

Nominal Thickness (mm)	Tolerance (mm)
0.7	±0.07
1.1	±0.1
1.75	±0.1
2.0	±0.2
2.25	±0.2
2.75	±0.2
3.3	±0.2
3.8	±0.2
5.0	±0.2
5.5	±0.2
6.5	±0.2
7.5	±0.3
9.0	±0.3
11.0	±0.3
13.0	±0.5
15.0	±0.5
16.0	±0.5
19.0	±0.5
21.0	±0.7
25.4	±1.0

[1]RTD = Resistance to Temperature Differences
Panels measuring 25 x 25 cm^2 (10 x 10 inches) are heated in the center of the panel to a defined temperature, and the edges are maintained at room temperature. The RTD value is the difference in temperature between the hot center of the panel and the cool panel edge, at which breakage occurs in less than or equal to 5% of the samples.

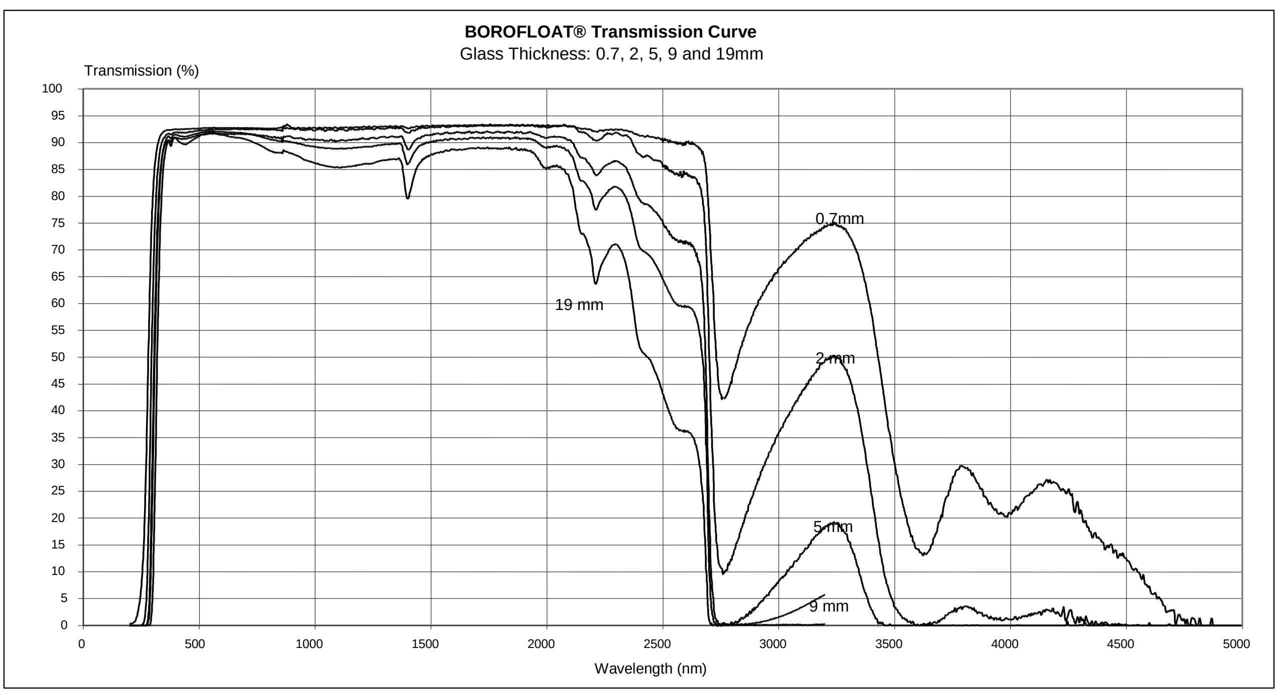
The samples are abraded with sandpaper before testing. This simulates extreme damage which is possible in usage.

[2]RTS - Resistance to Thermal Shock
Panels measuring 20 x 20 cm^2 (8 x 8 inches) are heated in an oven with circulating air and afterwards doused in the center with 50 ml of cold water (room temperature).

The RTS value is the difference in temperature between the hot panel and the cold water (room temperature), at which breakage occurs in less than or equal to 5% of the samples.

Before being heated, the samples are abraded with sandpaper. This simulates a typical state of the surface in practical use.

All data are intended to be used as guidelines, unless otherwise stated. Please contact Schott should you have additional technical questions.



Supersedes All Previous Releases