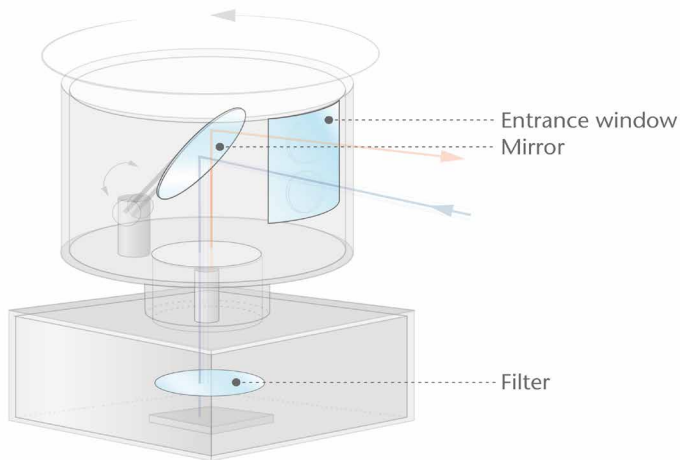


LiDAR systems inspired by BOROFLOAT® 33

In touch with the future

The reliable and consistent quality of BOROFLOAT® 33, coupled with an outstanding versatility to address the demands of even the most sophisticated applications, make BOROFLOAT® 33 a perfect specialty glass solution also for LiDAR systems. It combines superior quality and excellent flatness with outstanding thermal, optical, chemical and mechanical features.

BOROFLOAT® 33 – The sum of its properties is what makes it unique!



3 components of a traditional LiDAR unit could be made of BOROFLOAT® 33 borosilicate glass.

Entrance window

- Exceptionally high transparency
- High chemical durability
- Outstanding thermal resistance/ stability
 - Low thermal expansion even in lowest temperature ranges
- Excellent mechanical strength
 - Strong resistance to abrasion and scratches

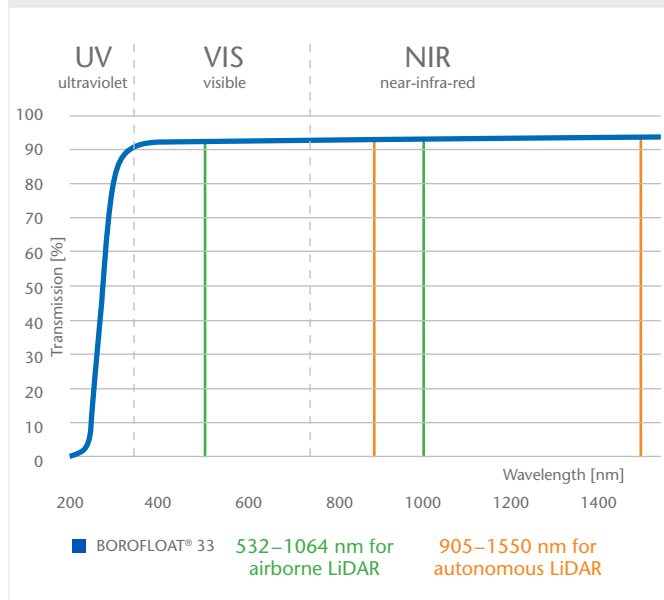
Mirror (Beamsplitter)

- Very good temperature stability
- Excellent resistance to thermal shock

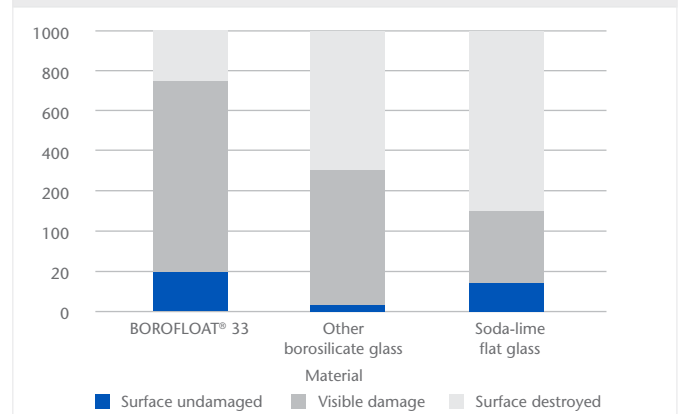
Filter

- Significantly increased transparency for colorless visual appearance
- Low color shift in VIS-Transmission
- Low Coefficient of Linear Thermal Expansion (C.T.E. $3.25 \cdot 10^{-6} \text{ K}^{-1}$)
- Excellent flatness due to unique Microfloat process

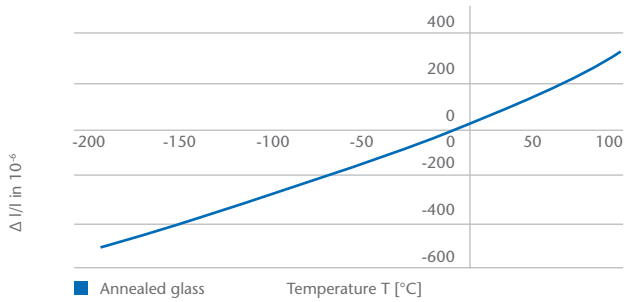
Significantly increased transparency



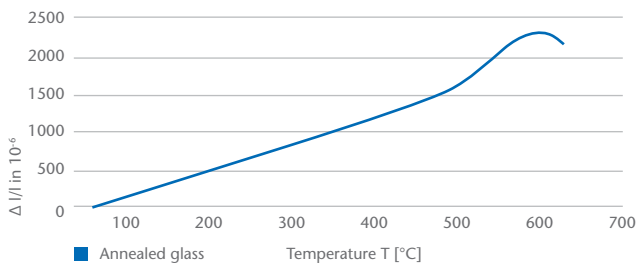
Resistance to abrasion and scratches



Expansion behavior in lowest temperature range



Thermal expansion



Thermal properties

Coefficient of Linear Thermal Expansion α (20–300 °C)	$3.25 \times 10^{-6} \text{ K}^{-1}$
Specific heat capacity c_p (20–100 °C)	$0.83 \text{ kJ}/(\text{kg}\cdot\text{K})^{-1}$
Thermal conductivity λ (90 °C)	$1.2 \text{ W}/(\text{m}\cdot\text{K})^{-1}$

Maximum operating temperatures

For short-term usage (< 10 h)	500 °C
For long-term usage (\geq 10 h)	450 °C

Viscosity of BOROFLOAT® 33

Working Point (104 dPas)	1270 °C
LITTLETON-temperatur / Softening point (107,6 dPas)	820 °C
Annealing Point (1013 dPas)	560 °C
Strain Point (1014,5 dPas)	518 °C
Transformation temperatur (T _g)	525 °C

Chemical durability

Hydrolytic resistance	(according to ISO 719 / DIN 12 111)	HGB 1
	(according to ISO 720)	HGA 1
Acid resistance	(according to ISO 1776 / DIN 12 116)	1
Alkali resistance	(according to ISO 695 / DIN 52 322)	A 2

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 glass made of ideas