



BOROFLOAT® 33 & Windshields

A union of technology and durability.

BOROFLOAT® 33, the world's first floated borosilicate glass, has served the market for almost three decades. It is a truly unique material with unlimited opportunities for uses where high mechanical resistance, optical clarity, and thermal or chemical resistance are required. With these unique properties, BOROFLOAT® 33 is a perfect solution for technical and smart windshields.

Truck Windshields must be tough and reliable.

Windshield replacements can be costly, especially as more technology is integrated into the glass. When cameras, sensors, or safety equipment are part of the windshield, a high-performance material keeps trucks running effectively and efficiently. Windshields containing BOROFLOAT® 33 can survive harsh road conditions and have superior stone impact and scratch resistance when compared to conventional materials. This means fewer repairs and downtime when reliability is essential to your business.

The sum of its properties is what makes it unique.



Superior
Mechanical
Strength



Scratch
Resistance



Excellent Flatness



Low Weight



Broad Thickness
Range

SCHOTT
glass made of ideas

SCHOTT BOROFLOAT® 33

Technical Information

Mechanical Properties

Density ρ (25° C)	2.23 g/cm ³
Young's Modulus E (according to DIN 13316)	64 kN/mm ²
Poisson's Ratio μ (according to DIN 13316)	0.2
Knoop Hardness HK _{0.1/20} (according to DIN ISO 9385)	480

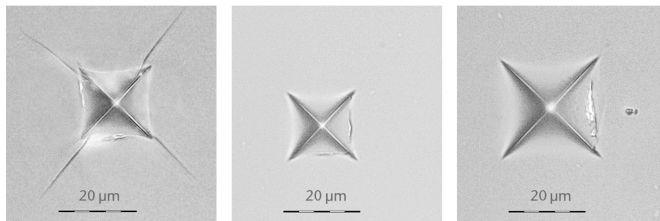
Mechanical Strength

The bending strength σ_B of BOROFLOAT® 33 with a:

- Typical float glass surface is normally 150 MPa*.
- Higher values are possible.
- Surface pre-damaged to simulate used condition is ~ 25 MPa**.

Vickers Test

Mechanical resistance to penetration by a pointed object—BOROFLOAT® 33 is particularly resistant due to its glass structure



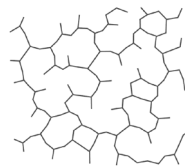
Soda-lime glass – 2N

BOROFLOAT® 33 – 2N

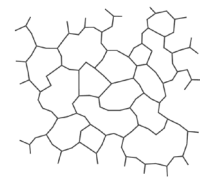
BOROFLOAT® 33 – 4N

Glass Network Structure

Soda-lime glass



BOROFLOAT® 33

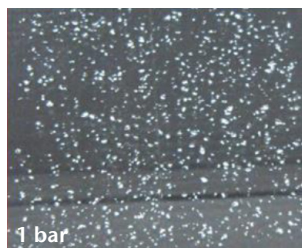


The structure of BOROFLOAT® 33 glass exhibits a highly connected network resulting in superior scratch resistance, low crack initiation, high elasticity, and reduced weight. This high resistance to crack initiation in BOROFLOAT® 33 glass plays an important role in mitigating glass chipping or, worst case, glass breakage when exposed to sharp impacts. The low density is beneficial when low weight is a consideration.

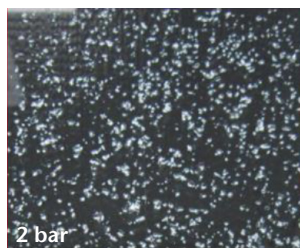
Stone Impact Tests according to DIN EN ISO 20567

Mechanical resistance to gravel shot onto the glass—BOROFLOAT® 33 is highly impact resistant.

Soda-lime glass***

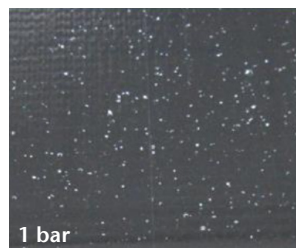


Damaged surface area 10.7%

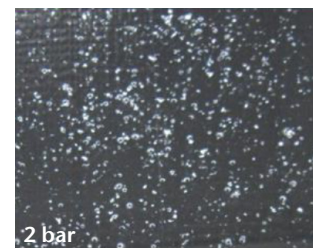


Damaged surface area 19.2%

BOROFLOAT® 33***



Damaged surface area 2.5%



Damaged surface area 5.5-10.7%

* typical value determined in accordance with DIN EN ISO 1288-5; glass thickness 2.75 mm

** Pre-damaged with 220 sandpaper; based on the former DIN 52292 Part 1

*** image section app. 75mm x 75mm

Further and detailed explanations of the technical data can be found at SCHOTT.com/BOROFLOAT or are available upon request.

SCHOTT North America, Inc., Home Tech
5530 Shepherdsville Road
Louisville, Kentucky 40228, USA
Phone +1 (502) 657-4417
Fax +1 (502) 966-4976
borofloat@us.schott.com
www.us.schott.com/borofloat

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