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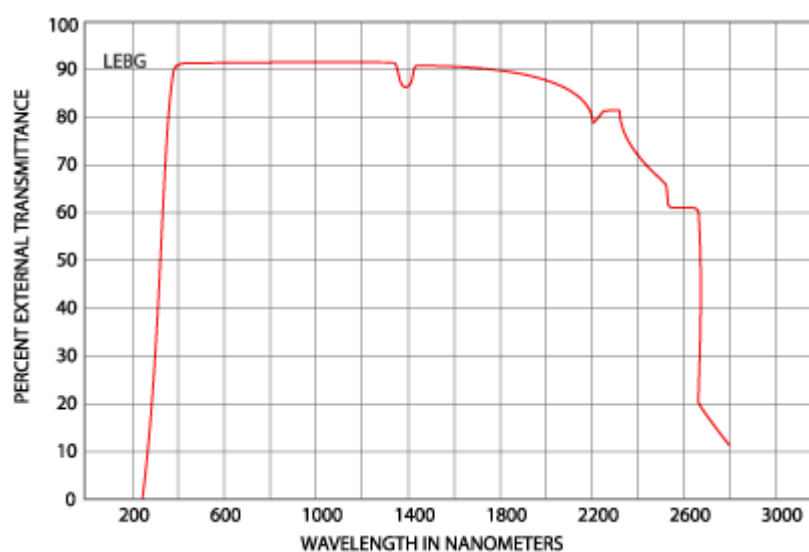
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Material Properties

Low-Expansion Borosilicate Glass

The most well-known low-expansion borosilicate glass (LEBG) is Pyrex® made by Corning. It is well suited for applications in which high temperature, thermal shock, or resistance to chemical attack are primary considerations. On the other hand, LEBG is typically less homogeneous and contains more striae and bubbles than optical glasses such as BK7. This material is ideally suited to such tasks as mirror substrates, condenser lenses for high-power illumination systems, or windows in high-temperature environments. Because of its low cost and excellent thermal stability, it is the standard material used in test plates and optical flats. As seen in the figure below, transmission of LEBG extends into the ultraviolet and well into the infrared.



External transmittance for 8-mm-thick uncoated low-expansion borosilicate glass

The index of refraction in this material varies considerably from batch to batch. Typical values are shown in the accompanying table.

Refractive Index of Low- Expansion Borosilicate Glass

Wavelength (nm)	Refractive Index, n	Fraunhofer Designation	Source	Spectral Region
486.1	1.479	F	H ₂ arc	Blue
514.5	1.477		Ar laser	Green
546.1	1.476	e	Hg arc	Green
587.6	1.474	d	Na arc	Yellow
643.8	1.472	C'	Cd arc	Red

LOW-EXPANSION BOROSILICATE GLASS CONSTANTS

Abb?Constant: $v_d = 66$ Density: 2.23 g cm^{-3} at 25°C

Young's Modulus: $5.98 \times 10^9 \text{ dynes/mm}^2$

Poisson's Ratio: 0.20

Poisson's Ratio: 0.20

Specific Heat at 25°C: 0.17 cal/g°C

Coefficient of Linear Expansion (0° to 300°C): $3.25 \times 10^{-6}/^{\circ}\text{C}$

Softening Point: 820°C

Melting Point: 1250°C

Pyrex® is a registered trademark of Corning, Inc.

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