

LG-760 Phosphate Laser Glass

For High Energy Applications

Neodymium Laser Properties

Emission Peak, λ [nm]	1054
Emission Width, $\Delta\lambda_{em}$ [nm]	24.3
Radiative Lifetime, τ_{rad} [μ sec]	323
Emission Cross Section + σ_{em} [10^{-20} cm ²]	4.5
*Quenching Constant-Zero Concentration Lifetime, τ_0 [μ sec]	330
*Quenching Constant-Q Factor, Q [10^{20} cm ⁻³]	10.0

* Lifetime as a function of neodymium content is approximated by:
 $T = \tau_0 / (1 + (Nd/Q)^2)$, Nd = Nd concentration in 10^{20} ions/cm³

Optical Properties

n_d	1.5190
V_d	69.20
$n_{633\text{ nm}}$	1.5140
$n_{1054\text{ nm}}$	1.5080
Nonlinear Refractive Index at 1054 nm, n_2 [10^{-13} esu]	1.02
Stress-Optic Coefficient, K (588 nm, 22°C) [10^{-6} mm ² /N]	2.00
Stress-Optic Coefficient, $-K_{par}$ (632.8 nm, 25°C) [10^{-6} mm ² /N]	2.02
Stress-Optic Coefficient, $-K_{per}$ (632.8 nm, 25°C) [10^{-6} mm ² /N]	4.02
Temperature Coefficient of Refractive Index, dn/dT_{rel} (1060 nm, 20-40°C) [$10^{-6}/^\circ$ C]	-6.8
Temperature Coefficient of Optical Pathlength, $W = \alpha_{20-40^\circ\text{C}}(n-1) + dn/dT$ [$10^{-6}/^\circ$ C]	-0.4

Sellmeier Coefficients

B1	C1
B2	C2
B3	C3

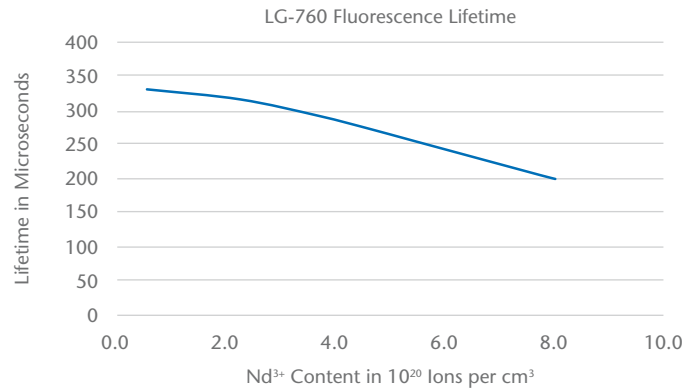
Attenuation Coefficient [cm⁻¹]

400 nm	≤ 0.20	3000 nm	≤ 0.80
1054 nm	≤ 0.0015	3333 nm	≤ 2.00

Chemical Properties

Weight Loss in 50°C Water [mg/(cm ² •day)]	0.028
Acid Resistance SR pH = 0.3 at 25°C	4.0
Alkali Resistance AR pH = 12 at 50°C	4.0
Staining Resistance FR pH = 4.6 100h at 25°C	1
Climatic Resistance CR Water Vapor at 40–50°C for 30 h	2

LG-760 is a potassium-barium-aluminum-phosphate based glass with a high cross section for stimulated emission, low nonlinear refractive index, and the best athermal characteristics.



Physical Properties

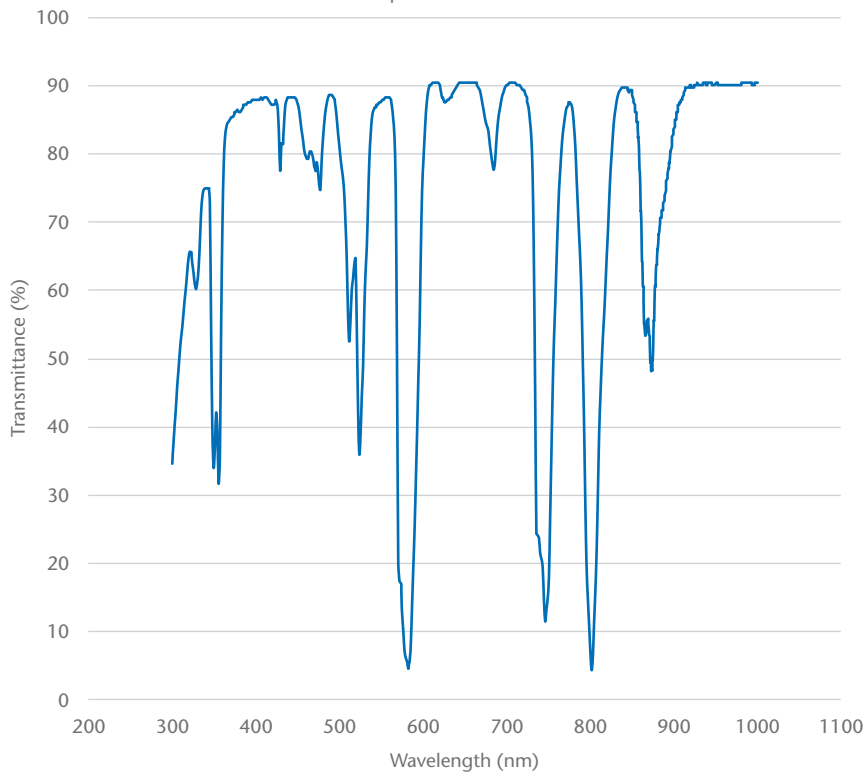
Density, ρ [g/cm ³]	2.600
Thermal Conductivity (25°C), κ [W/m•K]	0.57
Thermal Conductivity (90°C), κ [W/m•K]	0.60
Young's Modulus, E [GPa]	53.70
Poisson's Ratio, ν	0.267
Fracture Toughness, K_{Ic} [MPa•m ^{1/2}]	0.47
Knoop Hardness, $HK_{0.1/20}$	340
Heat Capacity (25°C), C_p [J/g°C]	0.75
Thermal Diffusivity (25°C), σ [10^{-7} m ² /sec]	2.92
Thermal Expansion, $\alpha_{20-300^\circ\text{C}}$ [$10^{-7}/^\circ$ C]	150.4
Thermal Expansion, $\alpha_{20-40^\circ\text{C}}$ [$10^{-7}/^\circ$ C]	125.0
Transformation Temperature, T_g [°C]	350

SCHOTT
 glass made of ideas

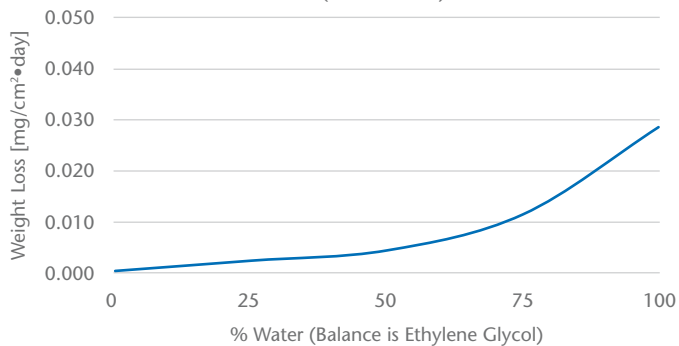
LG-760 Phosphate Laser Glass

For High Energy Applications

Transmission Curve for LG-760
Neodymium Content 2wt%Nd₂O₃
Sample Thickness 5.0 mm



LG-760 Ethylene Glycol/Water
Resistance Testing
(24hr at 50°C)



Advanced Optics
SCHOTT North America, Inc.
400 York Avenue
Duryea, PA 18642
USA
Phone +1 570/457-7485
Fax +1 570/457-7330
info.optics@us.schott.com

www.us.schott.com/advanced_optics

SCHOTT
glass made of ideas