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} [µsec]	323
Emission Cross Section + σ_{em} [10^{-20} cm^2]	4.5
*Quenching Constant-Zero Concentration Lifetime, τ_o [µsec]	330
*Quenching Constant-Q Factor, Q [10^{20} cm^{-3}]	10.0

*Lifetime as a function of neodymium content is approximated by: $T=T_o/(1+(Nd/Q)^2)$, Nd=Nd concentration in 10^{20} ions/cm^3

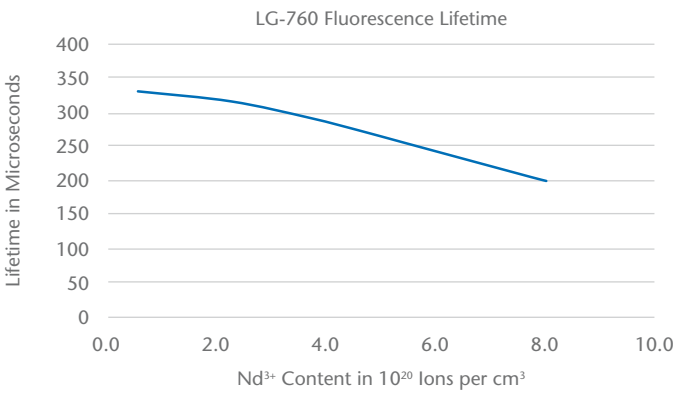
Optical Properties	
n_d	1.5190
v_d	69.20
$n_{633\ nm}$	1.5140
$n_{1054\ nm}$	1.5080
Nonlinear Refractive Index at 1054 nm, n_2 [10^{-13} esu]	1.02
Stress-Optic Coefficient, K (588 nm, 22°C) [10^{-6} mm^2/N]	2.00
Stress-Optic Coefficient, $-K_{par}$ (632.8 nm, 25°C) [10^{-6} mm^2/N]	2.02
Stress-Optic 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}/° C]	–6.8
Temperature Coefficient of Optical Pathlength, $W = \alpha_{20-40°C}$ (n-1) + dn/dT [10^{-6}/°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_{1c} [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, $\alpha_{20-300°C}$ [10^{-7}/°C]	150.4
Thermal Expansion, $\alpha_{20-40°C}$ [10^{-7}/°C]	125.0
Transformation Temperature, T_g [°C]	350

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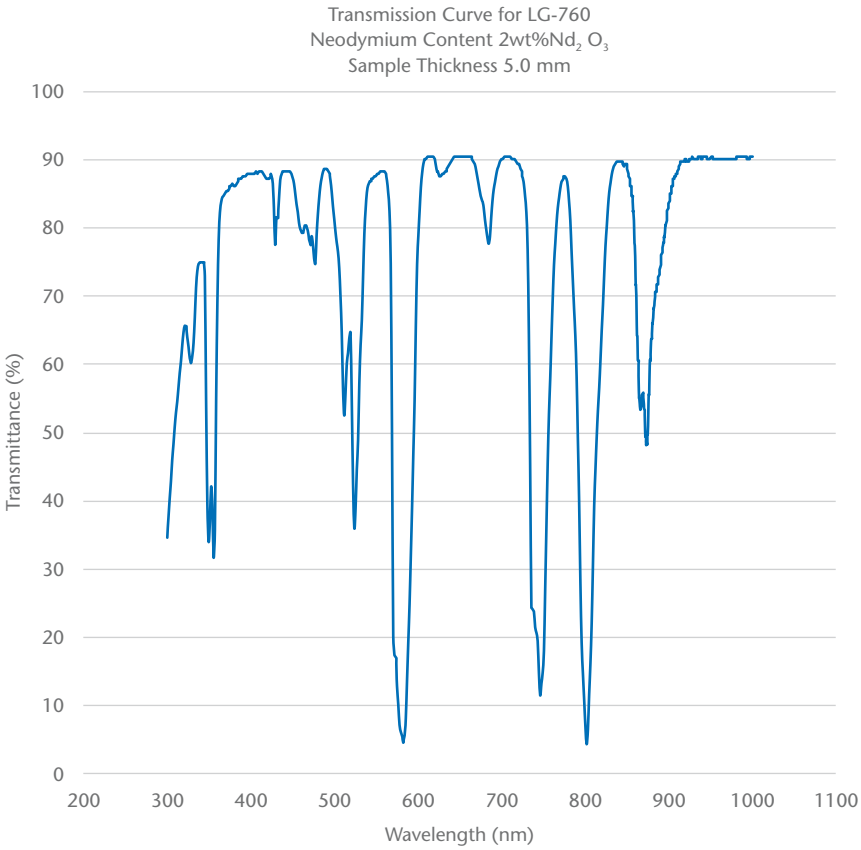

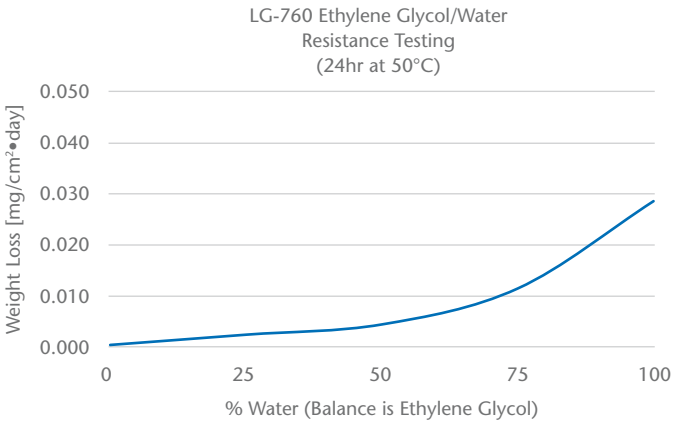

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