LG-680 Silicate Laser Glass

Neodymium Laser Properties	
Emission Peak, λ [nm]	1059.7
Emission Width, $\Delta\lambda_{em}$ [nm]	35.9
Radiative Lifetime, τ_{Rad} [µs]	361
Emission Cross Section σ_{em} [10^{-20} cm^2]	2.54
*Quenching Constant-Zero Concentration Lifetime, τ_o [µs]	337
*Quenching Constant-Q Factor, Q [10^{20} cm^{-3}]	5.5

*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	1.5705
v_d	57.51
$n_{633\ nm}$	1.5684
$n_{1054\ nm}$	1.5588
Nonlinear Refractive Index at 1054 nm, n_2 [10^{-20} m^2/W]	4.3
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]	0.36
Stress-Optic Coefficient, $-K_{per}$ (632.8 nm, 25 °C) [10^{-6} mm^2/N]	2.38
Temperature Coefficient of Refractive Index, dn/dT_{rel} (1060 nm, 20–40 °C) [10^{-6}/K]	2.9
Temperature Coefficient of Optical Pathlength, $W = \alpha_{+20/+40\,°C}\,(n-1) + dn/dT$ [10^{-6}/K]	8.1

Sellmeier Coefficients			
B1	1.08521	C1	0.00626
B2	0.34218	C2	0.02100
B3	1.39921	C3	150.456

Attenuation Coefficient [cm^{-1}]			
400 nm	0.10		
1054 nm	0.0020	3333 nm	2.00

LG-680 is the classic lithium-aluminum based glass with high cross section for stimulated emission, high ultraviolet transmission and high resistance to solarization.

Physical Properties	
Density, ρ [g/cm^3]	2.540
Thermal Conductivity (25 °C), λ [W/m·K]	1.19
Thermal Conductivity (90 °C), λ [W/m·K]	1.35
Young's Modulus, E [10^3 N/mm^2]	90.10
Poisson's Ratio, µ	0.242
Fracture Toughness, K_{1c} [MPa·m$^{1/2}$]	0.86
Knoop Hardness, $HK_{0.1/20}$	620
Heat Capacity (25 °C), C_p [J/g·K]	0.92
Thermal Diffusivity (25 °C), σ [10^{-7} m^2/s]	5.09
Thermal Expansion, $\alpha_{+20/+300\,°C}$ [10^{-6}/K]	10.18
Thermal Expansion, $\alpha_{+20/+40\,°C}$ [10^{-6}/K]	9.3
Transformation Temperature, T_g [°C]	468

Chemical Properties	
Weight Loss in 50 °C Water [mg/(cm^2·d)]	0.050
SR	1.0
AR	1.0
FR	0
CR	4

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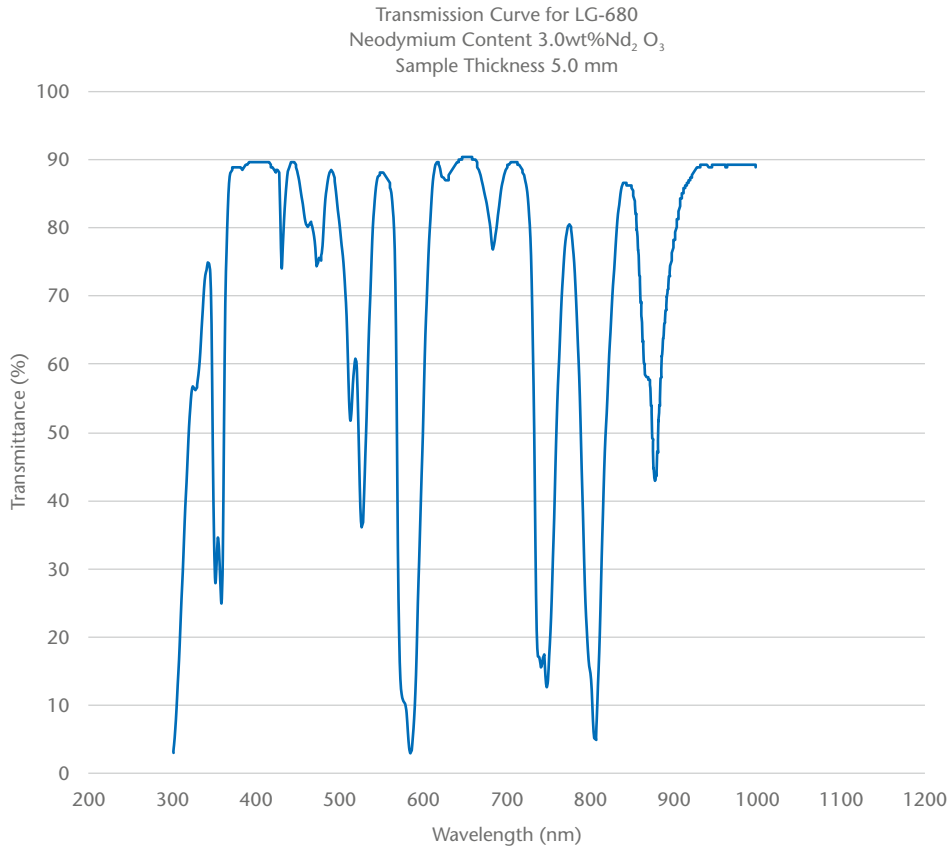

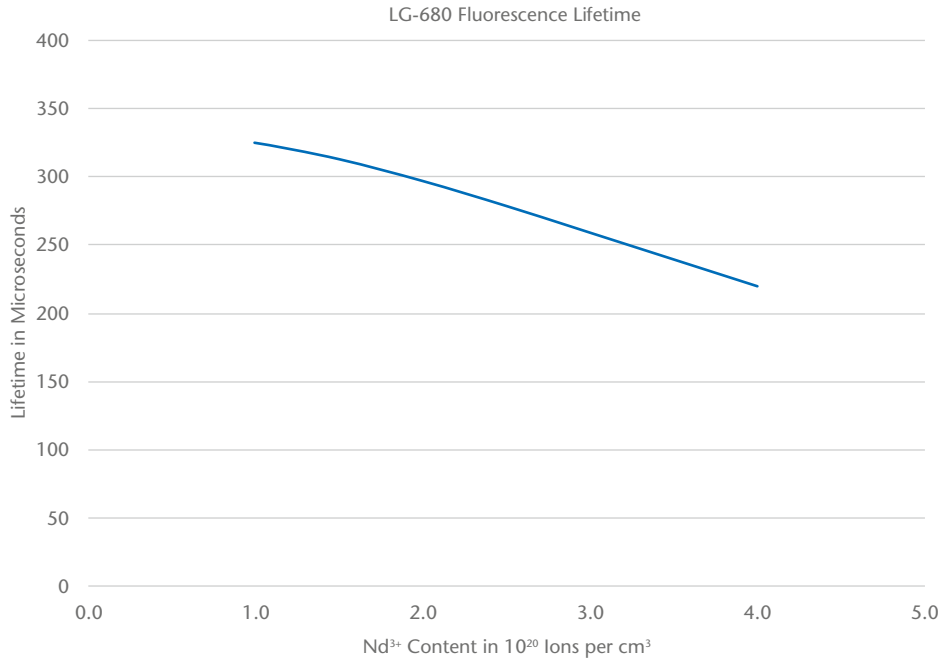

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