LG-680 Silicate Laser Glass

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

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

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

Optical Properties			
n_d	1.5600		
v_d	57.70		
n_{633nm}	1.5680		
n_{1054nm}	1.5600		
Nonlinear Refractive Index at 1054nm, n_2 [10^{-13} esu]	1.60		
Stress-Optic Coefficient, K (588nm, 22°C)[$10^{-6}mm^2/N$]	2.00		
Stress-Optic Coefficient, $-K_{par}$ (632.8nm, 25°C)[$10^{-6}mm^2/N$]	0.36		
Stress-Optic Coefficient, $-K_{per}$ (632.8nm, 25°C)[$10^{-6}mm^2/N$]	2.38		
Temperature Coefficient of Refractive Index, dn/dT_{rel} (1060nm, 20-40°C) [10^{-6}/°C]	2.9		
Temperature Coefficient of Optical Pathlength, $W=\alpha_{20-40°C}(n-1)+dn/dT$ [10^{-6}/°C]	8.1		
Sellmeier Coefficients			
B1		C1	
B2		C2	
B3		C3	
Attenuation Coefficient [cm^{-1}]			
400nm	≤0.10	3000nm	≤0.80
1054nm	≤0.0020	3333nm	≤2.00

Physical Properties	
Density, *p* [g/cm^3]	2.540
Thermal Conductivity (25°C), *K* [W/m•K]	1.19
Thermal Conductivity (90°C), *K* [W/m•K]	1.35
Young's Modulus, E [GPa]	90.10
Poisson's Ratio, *v*	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°C]	0.92
Thermal Diffusivity (25°C),σ [$10^{-7}m^2/sec$]	5.09
Thermal Expansion, $\alpha_{20-300°C}$ [10^{-7}/°C]	101.8
Thermal Expansion, $\alpha_{20-40°C}$ [10^{-7}/°C]	93.0
Transformation Temperature, T_g [°C]	468

Chemical Properties	
Weight Loss in 50°C Water [$mg/(cm^2•day)$]	0.050
Acid Resistance SR pH=0.3 at 25°C	1.0
Alkali Resistance AR pH=12 at 50°C	1.0
Staining Resistance FR pH=4.6 100h at 25°C	0
Climatic Resistance CR Water Vapor at 40-50°C for 30 h	4

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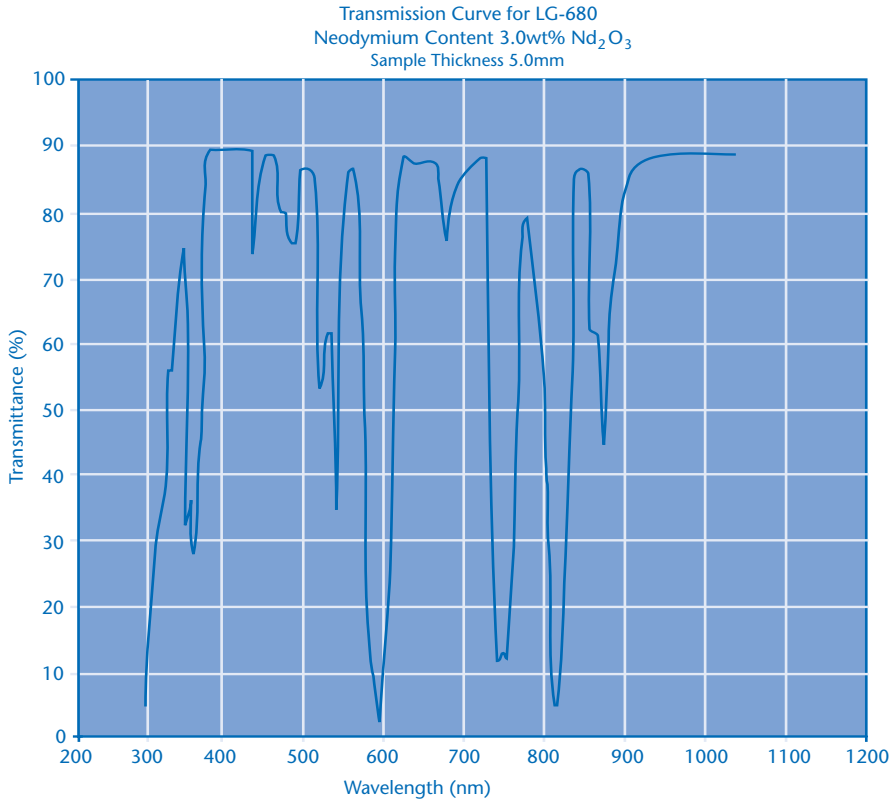

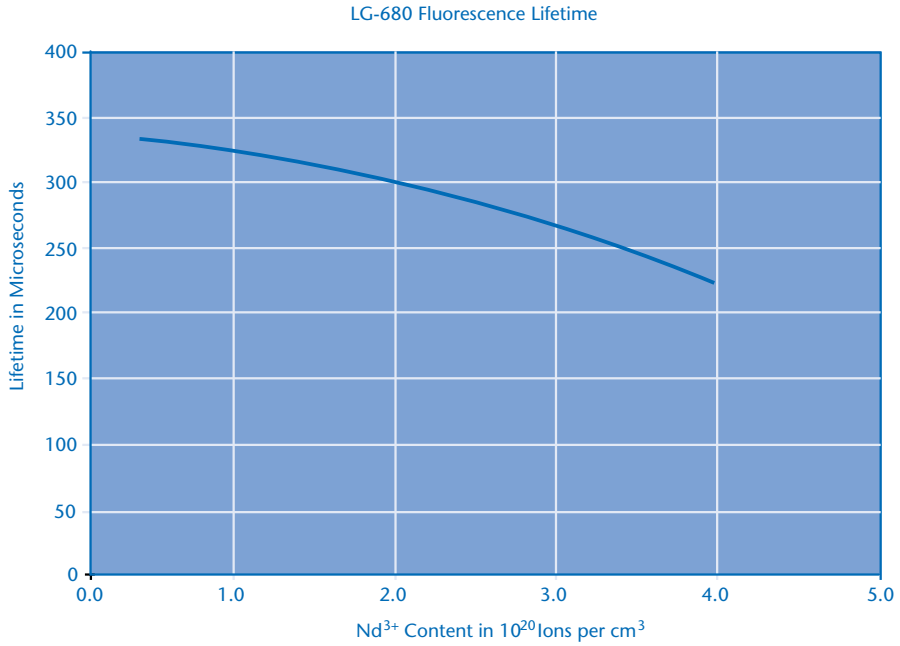

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