

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 T_{Rad} [μ sec]	361
Emission Cross Section σ_{em} [$10^{-20}cm^2$]	2.54
*Quenching Constant-Zero Concentration Lifetime, T_0 [μ sec]	337
*Quenching Constant-Q Factor, Q [$10^{20}cm^{-3}$]	5.5

*Lifetime as a function of neodymium content is approximated by: $T=T_0/(1+(Nd/Q)^2)$,
Nd=Nd concentration in 10^{20} ions/cm³

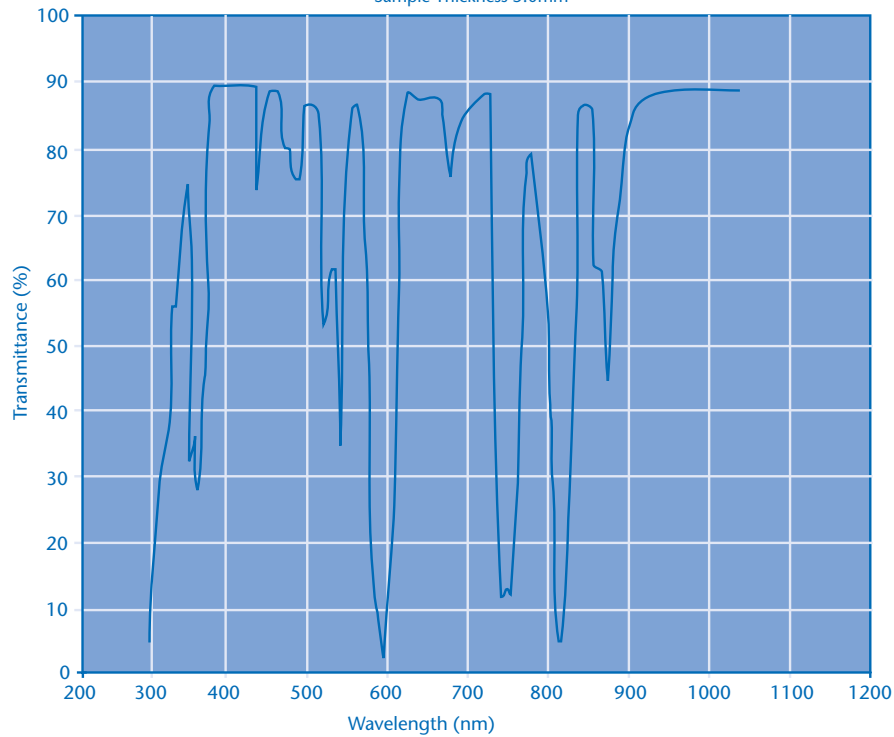
Optical Properties			
n_d	1.5600		
v_d	57.70		
n_{633nm}	1.5680		
n_{1054nm}	1.5600		
Nonlinear Refractive Index at 1054nm, n_2 [10^{-13} esu]	1.60		
Stress-Optic Coefficient, K (588nm, 22°C)[$10^{-6}mm^2/N$]	2.00		
Stress-Optic Coefficient, $-K_{par}$ (632.8nm, 25°C)[$10^{-6}mm^2/N$]	0.36		
Stress-Optic 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) [$10^{-6}/^\circ C$]	2.9		
Temperature Coefficient of Optical Pathlength, $W=\alpha_{20-40^\circ C}(n-1)+dn/dT$ [$10^{-6}/^\circ C$]	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, ρ [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, ν	0.242
Fracture Toughness, K_{Ic} [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, $\alpha_{20-300^\circ C}$ [$10^{-7}/^\circ C$]	101.8
Thermal Expansion, $\alpha_{20-40^\circ C}$ [$10^{-7}/^\circ C$]	93.0
Transformation Temperature, T_g [°C]	468

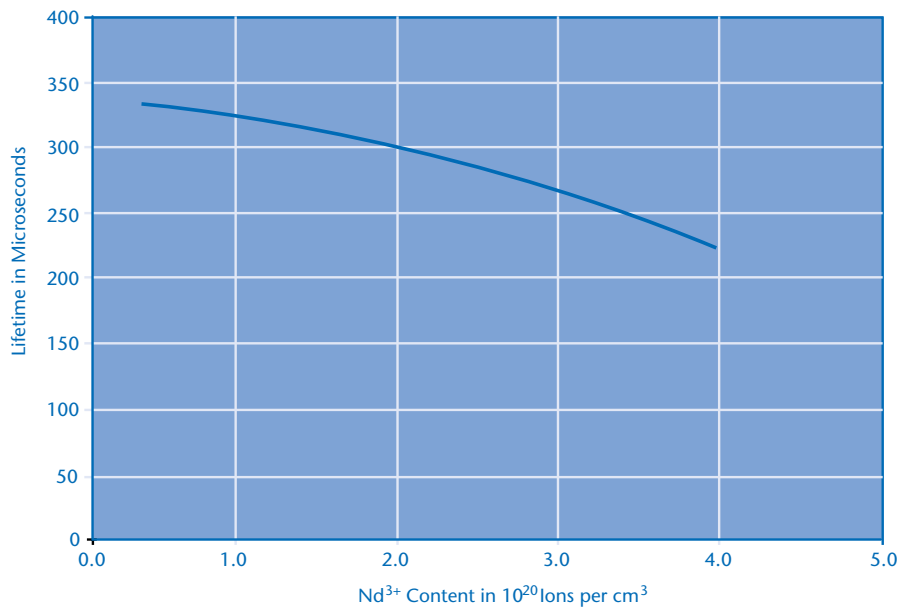
Chemical Properties	
Weight Loss in 50°C Water [mg/(cm ² •day)]	0.050
Acid Resistance SR pH=0.3 at 25°C	1.0
Alkali Resistance AR pH=12 at 50°C	1.0
Staining Resistance FR pH=4.6 100h at 25°C	0
Climatic Resistance CR Water Vapor at 40-50°C for 30 h	4

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Transmission Curve for LG-680
Neodymium Content 3.0wt% Nd₂O₃
Sample Thickness 5.0mm



LG-680 Fluorescence Lifetime



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