LG-910 ‘Eye-Safe’ Laser Glass

Phosphate laser glass for laser-range finding and medical applications; operation at 1.5 µm

Product Information

The LG-910 is an Erbium - Ytterbium - Chromium doped phosphate based laser glass used in diode and flashlamp pumped solid-state laser systems. Phosphate glasses generally offer higher solubility of rare earth dopants, thus the amount of active ions can be significantly increased.

Applications

Laser-range finding applications
Medical lasers such as for dermatological use

Advantages

Good athermal properties
High transmission at the lasing wavelength
Consistent quality and high homogeneity

Quality Assurance

Quality control is based on statistical process control, as well as on rigorous final inspection of the finished component. Glass properties are measured for every melt. Measurement instruments include a broad range of interferometers, spectrophotometers, physical property test systems, vision systems, and a laser test bed.

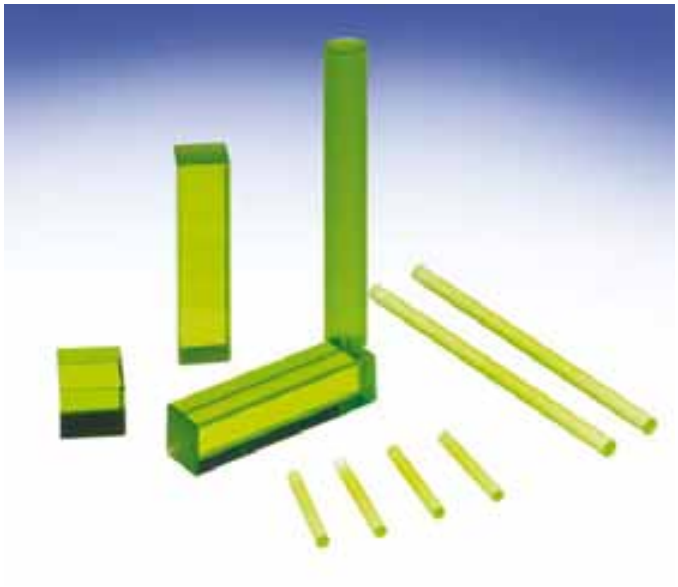
Forms of Supply

We supply fully finished laser components fabricated to custom specifications (e.g. rods, slabs and discs) with robust dielectric coatings exceeding laser damage thresholds of >1.5GW/cm^2.

Application Support

Please contact us with your requested laser glass specifications. Our experienced application team is trained to find the right solution for your application.

*This glass is suitable for “eye-safe” laser devices. Actual safety depends on product configuration.



Erbium Laser Properties

Emission Peak, λ [nm]	1533
Emission Effective Linewidth [nm]	52.2
Emission Linewidth, FWHM [nm]	26.3
Loss at Lasing Wavelength* [cm^{-1}]	0.09
Radiative Lifetime, τ_{Rad} [msec]	8.1
Emission Cross Section, σ_{em} [$10^{-20}cm^2$]	0.77
Fluorescence Lifetime [msec]	8.7

* Loss at the lasing wavelength is dominated by ground state absorption of erbium and is thus a function of erbium content in the glass

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Optical Properties

Refractive Index, n_d	1.544
Abbe Number, v_d	62.4
Nonlinear Refractive Index, n_2 [10^{-13} esu]	1.3
Temperature Coefficient of Refractive Index dn/dT_{rel} at 1540 nm [10^{-6} /°C]	-4.7
Temperature Coefficient of Optical Pathlength W $=\alpha_{20\text{-}40C}$ (n - 1) + dn/dT_{rel} [10^{-6} /°C]	0.4
Refractive Index at 1540 nm, n_{1540nm}	1.536

Chemical Properties

Acid Resistance SR pH = 0.3 at 25 °C	2.3
Alkali Resistance AR pH = 12 at 50 °C	2.3
Staining Resistance FR pH = 4.6 100h at 25 °C	1.0
Climatic Resistance CR Water Vapor at 40-50 °C for 30 h	2.0

Physical Properties

Density, ρ [g/cm³]	3.16
Thermal Conductivity (25 °C), $\kappa_{25°C}$ [W/m•K]	0.45
Thermal Conductivity (90 °C), $\kappa_{90°C}$ [W/m•K]	0.48
Young's Modulus, E [GPa]	47.3
Poisson's Ratio, ν	0.27
Fracture Toughness, K_{IC} [MPa•m$^{1/2}$]	0.59
Knoop Hardness, $HK_{0.1/20}$	315
Heat Capacity (25°C), $C_{p25°C}$ [J/g°C]	0.61
Thermal Diffusivity (25°C), $\delta_{25°C}$ [10^{-7}m²/sec]	2.33
Thermal Expansion, $\alpha_{20\text{-}300°C}$ [10^{-7}/°C]	123
Thermal Expansion, $\alpha_{20\text{-}40°C}$ [10^{-7}/°C]	95
Transformation Temperature, T_g [°C]	460
Thermomechanical Figure of Merit $FOM_{TM} = K_{IC}\kappa_{25C}$ (1-ν)/$\alpha_{20\text{-}40C}$E	4.3 x 10^{-5}

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