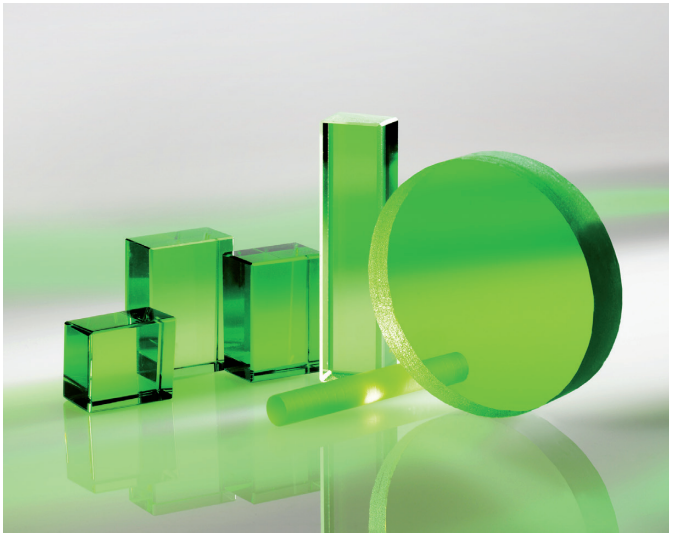
LG-940 'Eye-Safe' Laser Glass

Phosphate laser glass for rangefinding, medical and bio-photonic applications; operation at 1.5 µm

Product Information

The LG-940 is an Erbium – Ytterbium – Chromium – Cerium doped phosphate based laser glass used in flashlamp pumped and diode 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

- Medical lasers for dermatological use
- Analytical instrumentation
- Rangefinders

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 customer specifications (e. g. rods, slabs and discs) with high laser damage threshold dielectric coatings.

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.

Erbium Laser Properties	
Emission Cross Section Maxima, λ [nm]	1532.5
Effective Linewidth [nm]	39.9
Linewidth, FWHM [nm]	25.3
Loss at Lasing Wavelength* [cm^{-1}]	
Radiative Lifetime τ_{Rad} [msec]	11.1
Emission Cross Section, σ_{em} [$10^{-21} cm^2$]	7.1
Fluorescence Lifetime [msec]	9.4

*Loss at the lasing wavelength is dominated by ground state absorption of erbium and is thus a function of erbium content in the glass. This glass is suitable for "eye-safe" laser devices. Actual safety depends on product configuration.

Erbium has significant absorption at the lasing wavelength.
For further information please contact a sales representative.

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Optical Properties	
n_d	1.533
v_d	62.2
n_2 [10^{-13} esu]	1.3
dn/dT relative at 1.54 µm [10^{-6}/K]	–3.6
$n_{1540\ nm}$	1.522

Chemical Properties	
Weight Loss in 50 °C Water [mg / (cm² · day)]	0.025
Acid Resistance SR pH = 0.3 at 25 °C	4.3
Alkali Resistance AR pH = 12 at 50 °C	3.3
Staining Resistance FR pH = 4.6 100 h at 25 °C	0
Climatic Resistance CR Water Vapor at 40–50 °C for 30 h	1–2

Physical Properties	
Density, ρ [g / cm³]	3.04
Thermal Conductivity (25 °C), $\kappa_{25\,°C}$ [W / m · K]	0.51
Thermal Conductivity (90 °C), $\kappa_{90\,°C}$ [W / m · K]	0.61
Young's Modulus, E [GPa]	57.6
Poisson's Ratio, ν	0.26
Fracture Toughness, K_{1c} [MPa · m$^{1/2}$]	0.7
Knoop Hardness, $HK_{0.1/20}$	380
Heat Capacity (25 °C), $C_{p25\,°C}$ [J/g°C]	
Thermal Diffusivity (25 °C), $\delta_{25\,°C}$ [10^{-7}m²/sec]	
Thermal Expansion, $\alpha_{20-300\,°C}$ [10^{-7}/°C]	119.6
Thermal Expansion, $\alpha_{20-40\,°C}$ [10^{-7}/°C]	81.1
Transformation Temperature, T_g [°C]	456

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