

Crystaltechno Ltd. offers

New Nd: Phosphate Laser Glass LGN-0130

New Nd: phosphate laser glass LGN-0130 is the best material for high power laser systems. The Nd concentration of laser glass LGN-0130 can be changed from 1 to 5 10^{20} ion/cm³ according to customer's requirements. Stimulated emission cross section of new glass equals $\sigma = 3.5 \cdot 10^{-20}$ cm², this value is the same level of stimulated emission cross section as one of the famous laser glasses. LGN-0130 glass quantum efficiency of luminescence equals $\eta = 0,72$, it's the best value among another glasses, which have the same Nd concentration. Emission band width - 27 nm. Luminescence life time (μ s) $\tau = 286.3 \mu$ s

Thus high values of luminescence life time, stimulated emission cross section, quantum efficiency of luminescence and narrow emission band width, above-listed confirmed that new Nd: phosphate laser glass LGN-0130 is one of the best material for high power laser systems.

Let us consider thermo optical properties of new glass. LGN-0130 glass has low values of non-linear refractive index coefficient $n_2 = 1.084 \times 10^{-13}$ esu and temperature coefficient of refractive index $dn/dt = -6.0 \times 10^{-6}/K$ at (20-40) °C. It means that thermo wave front distortion will be minimized at high power pumping and high power laser radiation.

Value of the attenuation coefficient at 586nm $a_{586} = 0,326 \text{ mm}^{-1}$, which depends on Nd concentration, and low value of attenuation coefficient at 1053nm $a_{1053} = 0,00094 \text{ cm}^{-1}$ proof that new Nd: phosphate laser glass LGN-0130 is high purity material.

New Nd: phosphate laser glass LGN-0130 is platinum free due to special design of crucible and stirrer, which made from dispersion-hardened material. The glass melting technology is optimized with a view of the best glass characteristics thanks to minimum allowable temperature and short time of technological conditions. And also there is the glass fine annealing at the special chamber.

At present the available sizes of the laser active elements are the following: laser rod dia. up to 60 mm, length up to 300 mm, laser disk gabarit size up to (250x200x40) mm. New technology line makes possible to increase laser disks gabarit size up to (600÷550) mm x (300x÷250) mm x (60÷50) mm.

So new Nd: phosphate laser glass LGN-0130 is the best material for high power laser systems.

Properties of Nd: Phosphate Laser Glass

Parameter	Laser Glasses Data (parameter value)							
	LGN-0130 «Crystaltechno»	GLS22	GLS32	GLS34	KGSS 0180/35	LG-750 «SCHOTT»	LHG-5 «HOYA»	LHG-6 «HOYA»
Nd ³⁺ conc. (10 ²⁰ ions/c.c)	3.074*	2,00	2,00	5,60	3.5	3,5	3,174	3,397
Cross section for stimulated emission (10 ⁻²⁰ cm ²)	3.5	3,2	3,2	3,2	3.6	3.7	3,9	3,7
Radiative life time (μ s)	397	400	402	450	360	356	-	-
Life time (μ s)	286.3	300	270	180	300	278	290	280

Emission band width (nm)	27	28,6	27	27	27	26	18,6	18,8
Fluorescence peak (nm)	1054	1055	1060	1060	1053	1053.7	1056	1056
Attenuation coefficient at 1053nm (cm ⁻¹)	0.00094	0.0015	0.0015	0.0015	0,0015	≤0.0015	0,001	-
Refractive index, n _e	1.52912	1,596	1,595	1,595	1.532	n _d =1.5260	n _d =1,54096	n _d =1,53226
Abbe number	65.84	59,3	56,9	-	-	68.20	63,49	66,28
Non-linear refractive index coefficient n ₂ (x10 ⁻¹³ esu)	1.084	1,65	1,75	-	1,1	1.08	1,25	1,15
Temperature coefficient of refractive index, dn/dt (10 ⁻⁶ /K) (20-40°C)	-6.0	-5,7	-	-	-	-5.1	-	-
Glass transition temp. (°C)	486.6	490	490	495	460	450	486	475
Coefficient of linear thermal expansion (10 ⁻⁷ /K) (20-120°C), α ₂₀₋₁₂₀	125.7	106	103	103	116 α ₂₀₋₄₀	130.1 α ₂₀₋₃₀₀	98 α ₁₀₀₋₃₀₀	104 α ₁₀₀₋₃₀₀
Density (g/cm ³)	2.7876	3,52	3,38	3,39	2.83	2.830	2,68	2,62
Attenuation coefficient at 586nm (mm ⁻¹)	0,326	0,260	0,260	0,770	0,424	0,392	-	-
Striae	No striae							
Bubbles (size: 0.03-0.3mm)	No bubbles							

* Concentration of Nd₂O₃ would vary with the change of diameter of rods/discs (low doping for large size).
Work piece range of cast (600±550)mm X (300x±250) mm X (60±50) mm.

If you are interested please feel free to contact us! You can receive the additional information

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