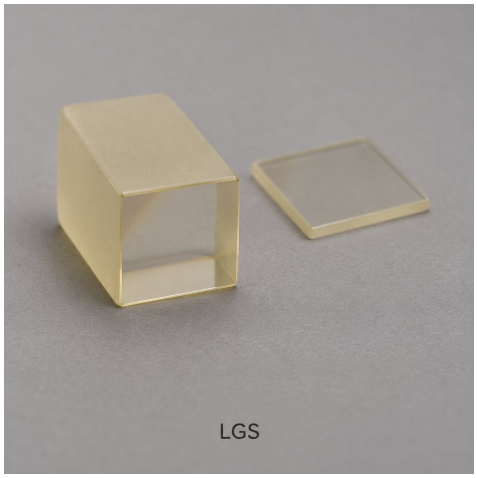
LGS (LiGaS2) Nonlinear Crystal for Mid-IR OPO and OPA, 0.32–11.6 µm

Model WQ-NLC-LGS · waveqvanta.com/products/lgs-ligas2-nonlinear-crystal

LGS (LiGaS2) is an orthorhombic mid-infrared nonlinear crystal with a wide band gap, low two-photon absorption, small group-velocity mismatch, high thermal conductivity and low thermal expansion. Its UV cut-off near 320 nm allows pumping with visible and all-solid-state near-IR lasers, and mid-IR sources based on LGS have reached tuning ranges covering 3.0–11.5 µm. It is used for OPO, OPA, DFG and SHG.


LGS

Key features

- Effective transmission range 0.32–11.6 µm
- UV cut-off at about 320 nm, allowing pumping by visible and near-IR solid-state lasers
- Damage threshold over 50 GW/cm^2 at 1030 nm, 300 fs
- Thermal conductivity 6–8 W/(m·K)
- Low thermal expansion: αa ≈ 1.5 × 10^{-6} /K, αc ≈ 2.0 × 10^{-6} /K
- Low two-photon absorption and small group-velocity mismatch
- Mid-IR output tunable over 3.0–11.5 µm has been demonstrated

Specifications

Chemical Formula	LiGaS2
Crystal System	Orthorhombic
Point Group	mm2
Lattice Constants	a = 6.513 Å, b = 7.863 Å, c = 6.218 Å
Effective Transmission Range	0.32–11.6 µm
UV Cut-off Wavelength	≈320 nm
Nonlinear Coefficients	d31 ≈ 5.8 pm/V, d24 ≈ 5.1 pm/V, d33 ≈ −10.7 pm/V
Thermal Conductivity	6–8 W/(m·K)
Thermal Expansion Coefficients	αa ≈ 1.5 × 10^{-6} /K, αc ≈ 2.0 × 10^{-6} /K
Damage Threshold	> 50 GW/cm^2 @ 1030 nm, 300 fs
Demonstrated Tuning Range	3.0–11.5 µm

Typical applications

- Mid-IR optical parametric oscillators (OPO)
- Optical parametric amplifiers (OPA)
- Difference-frequency generation (DFG)
- Second-harmonic generation (SHG)