HGS (HgGa2S4) Nonlinear Crystal for Mid-IR SHG and OPO, 0.55–13 µm

Model WQ-NLC-HGS · waveqvanta.com/products/hgs-hgga2s4-nonlinear-crystal

HGS (mercury thiogallate, HgGa2S4) is a negative uniaxial nonlinear crystal transparent from 0.55 to 13 µm. Its laser damage threshold and conversion efficiency support frequency doubling and OPO/OPA operation across 1.0–10 µm; a 4 mm long element has shown about 10% SHG efficiency for CO2 laser radiation (30 ns pulses, 60 MW/cm^2). Large HGS crystals are difficult to grow, so available apertures are confirmed at the time of quotation.



Key features

- Transparency range 0.55–13.00 µm
- Negative uniaxial crystal (no > ne)
- Energy gap 2.34 eV
- About 10% CO2 laser SHG efficiency in a 4 mm long element (30 ns, 60 MW/cm^2)
- Suitable for frequency doubling and OPO/OPA in the 1.0–10 µm range
- Mohs hardness 3–3.5; density 4.95 g/cm^3

Specifications

Chemical Formula	HgGa2S4
Optical Class	Negative uniaxial (no > ne)
Transparency Range	0.55–13.00 µm
Energy Gap	2.34 eV
Mohs Hardness	3–3.5
Density	4.95 g/cm^3
Operating Range (SHG, OPO/OPA)	1.0–10 µm
CO2 Laser SHG Efficiency	About 10% (4 mm length, 30 ns pulses, 60 MW/cm^2)

Typical applications

- Second harmonic generation of CO and CO2 lasers
- Optical parametric oscillators and amplifiers in the 1.0–10 µm range
- Difference-frequency generation into the mid-IR
- Frequency mixing in the mid-IR

Values are typical and subject to change. Custom sizes, cut angles and coatings are available on request.