AGGS (AgGaGeS4) Nonlinear Crystal for 1 µm-Pumped Mid-IR, 0.5–11.5 µm

Model WQ-NLC-AGGS · waveqvanta.com/products/aggs-aggages4-nonlinear-crystal

AGGS (AgGaGeS4) is a solid-solution nonlinear crystal transparent from 0.5 to 11.5 µm, with a nonlinear coefficient d31 = 15 pm/V and an absorption coefficient of 0.05 cm^{-1} at 1064 nm. It is used to shift 1.064 µm Nd:YAG output into the 4–11 µm mid-infrared range. Compared with its parent compounds it has a higher laser damage threshold and a wider choice of phase-matching conditions, making it an option alongside AgGaS2 for sustained, higher-power frequency conversion.



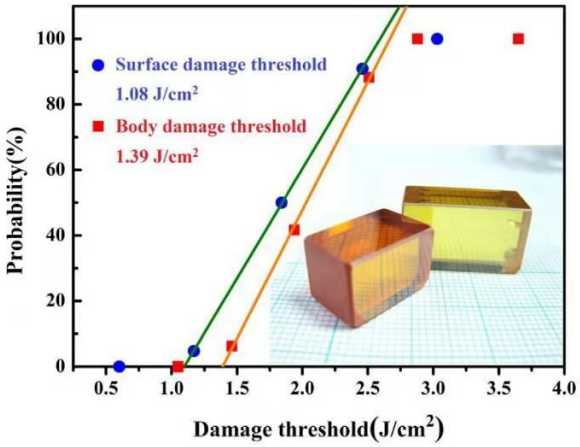
Key features

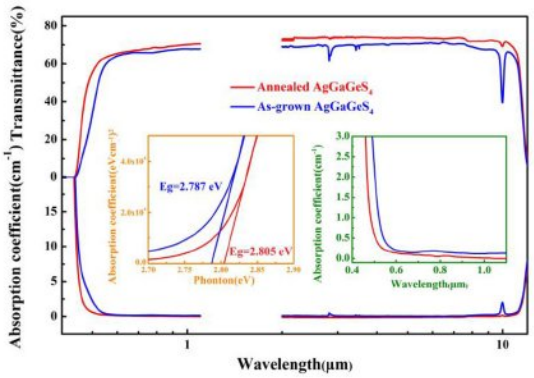
- Transparency range 0.5–11.5 µm
- Nonlinear coefficient d31 = 15 pm/V
- Absorption coefficient 0.05 cm^{-1} at 1064 nm
- Damage threshold 1.08 J/cm^2 (surface) and 1.39 J/cm^2 (bulk)
- Higher damage threshold and more phase-matching options than its parent crystals
- Standard apertures 5 × 5 mm and 8 × 8 mm, lengths 1–30 mm; custom sizes on request

Specifications

Chemical Formula	AgGaGeS4
Transparency Range	0.5–11.5 µm
Nonlinear Coefficient	d31 = 15 pm/V
Absorption Coefficient	0.05 cm^{-1} @ 1064 nm
Surface Damage Threshold	1.08 J/cm^2
Bulk Damage Threshold	1.39 J/cm^2
Standard Cross Sections	5 × 5 mm, 8 × 8 mm
Length Range	1–30 mm
Dimension Tolerance	(W ±0.1 mm) × (H ±0.1 mm) × (L +0.2/−0.1 mm)
Clear Aperture	> 90% of central area
Flatness	λ/6 @ 633 nm (T ≥ 1.0 mm)
Wavefront Distortion	< λ/6 @ 633 nm
Surface Quality	20/10 scratch/dig per MIL-O-13830A
Parallelism	Better than 1 arc min
Perpendicularity	5 arc min
Angle Tolerance	Δθ and Δφ within ±0.25°

Measured data (typical)





Standard sizes

Size	Cut / orientation	Surface / coating	Mount
5.8 × 5.7 × 1.9 mm	θ = 50°, φ = 0°	Blank (unpolished)	—
10.8 × 11.4 × 1.9 mm	θ = 50°, φ = 0°	Blank (unpolished)	—

Typical applications

- Frequency shifting of 1.064 μm Nd:YAG lasers into the 4–11 μm mid-IR
- Sustained, higher-power mid-IR frequency conversion where AgGaS2 is damage-limited
- Nonlinear interactions that need phase-matching schemes not available in AgGaS2