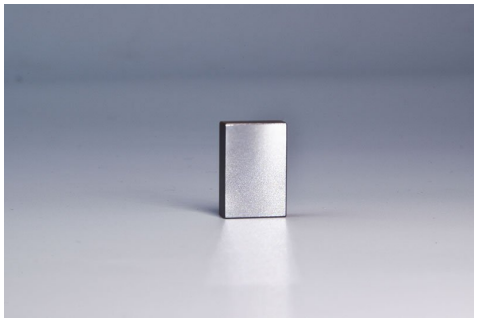
AGGSe (AgGaGe5Se12) Nonlinear Crystal for 1 µm-Pumped Mid-IR, 0.63–16 µm

Model WQ-NLC-AGGSE · waveqvanta.com/products/aggse-aggage5se12-nonlinear-crystal

AGGSe (AgGaGe5Se12) is a newer nonlinear optical crystal for shifting 1 µm solid-state lasers into the 2–12 µm mid-infrared range. Compared with AgGaS2 and AgGaSe2 it offers a higher damage threshold, larger birefringence and band gap, and more phase-matching options, which suits it to higher-power and specialised frequency conversion. It is transparent from 0.63 to 16 µm with a nonlinear coefficient d31 = 28 pm/V.



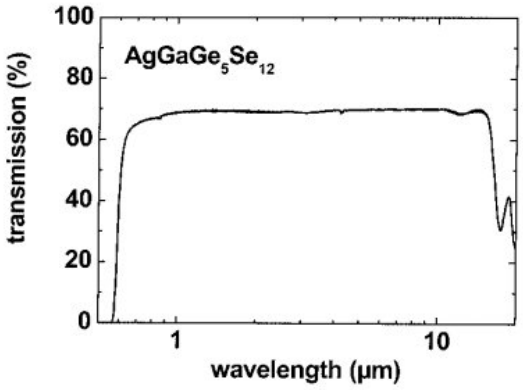
Key features

- Transparency range 0.63–16 µm
- Nonlinear coefficient d31 = 28 pm/V
- Higher damage threshold than AgGaS2 and AgGaSe2
- Larger birefringence and band gap, giving a wider choice of phase-matching schemes
- Coated elements up to 18.55 mm long, with HT coatings at 1064 nm, 1550 nm and 5–14 µm
- Flatness λ/8 @ 633 nm, parallelism better than 30 arc sec, orientation accuracy below 30 arc sec

Specifications

Chemical Formula	AgGaGe5Se12
Transparency Range	0.63–16 µm
Nonlinear Coefficient	d31 = 28 pm/V
Mid-IR Output Range (1 µm Pump)	2–12 µm
Dimension Tolerance	(W ±0.1 mm) × (H ±0.1 mm) × (L +1/−0.5 mm)
Clear Aperture	> 90% of central area
Flatness	λ/8 @ 633 nm (T ≥ 1 mm)
Surface Quality	60-40 scratch/dig after coating
Parallelism	Better than 30 arc sec
Perpendicularity	10 arc min
Orientation Accuracy	< 30 arc sec

Measured data (typical)



Standard sizes

Size	Cut / orientation	Surface / coating	Mount
5.25 × 5.5 × 18.55 mm	θ = 63°, φ = 0°	S1: HT @ 800–1500 nm (R < 1%); S2: HT @ 1064 nm (R < 1%) + 1550 nm (R < 1%) + 5–14 μm (R < 3%)	—
5.71 × 5.29 × 13.68 mm	θ = 61°, φ = 0°	S1: HT @ 800–1500 nm (R < 1%); S2: HT @ 1064 nm (R < 1%) + 1550 nm (R < 1%) + 5–14 μm (R < 3%)	—
5.72 × 5.58 × 13.7 mm	θ = 61°, φ = 0°	S1: HT @ 800–1500 nm (R < 1%); S2: HT @ 1064 nm (R < 1%) + 1550 nm (R < 1%) + 5–14 μm (R < 3%)	—
5 × 5 × 0.35 mm	θ = 65°, φ = 0°	Polished, uncoated	—
5 × 5 × 1.5 mm	θ = 65°, φ = 0°	Blank (unpolished)	—
5.5 × 5.5 × 3.5 mm	θ = 67°, φ = 0°	Blank (unpolished)	—

Typical applications

- Frequency down-conversion of 1 μm solid-state lasers into the 2–12 μm range
- Higher-power mid-IR frequency conversion as an alternative to AgGaS2 and AgGaSe2
- Specialised nonlinear interactions that need phase-matching schemes not available in AgGaS2 or AgGaSe2