



GaSe, Gallium selenide :

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GaSe gallium selenide crystal is a nonlinear optical material with a transmittance range of 0.65 to 18 μm . The terahertz oscillation of GaSe (gallium selenide) crystals can reach a very wide frequency domain, up to 41THz. GaSe is a negative uniaxial layered semiconductor crystal with a hexagonal structure of 62m spatial point groups, and a bandgap width of 2.2eV at 300K. GaSe crystal has a high damage resistance threshold, a large nonlinear coefficient (54pm/V), a very suitable transparent range, and an ultra-low absorption coefficient, making it a very important solution for mid infrared broadband electromagnetic wave oscillation. Due to the use of laser sources below 20 femtoseconds for broadband terahertz oscillation and detection, the GaSe emission detection system can achieve comparable or even better results than ZnTe. By selecting the thickness of GaSe crystals, we can achieve frequency selective control of THz waves.

Note: The cleavage surface of the GaSe crystal is (001), so a significant limitation on the use of this crystal is soft and fragile.

Main features: large nonlinear coefficient, high damage resistance threshold, wide transmission range, ultra-low absorption coefficient, broadband terahertz oscillation, and SHG conversion efficiency of CO₂ laser reaching 9%

Typical applications: terahertz time-domain systems, terahertz source crystals, mid to far infrared gas detection, CO₂ Lazer SHG and THZ experimental light sources for lasers, terahertz imaging

Materials Properties:

Material	GaSe
Transmission range(μm)	0.62 – 20
Nonlinear coefficient(pm/V)	d ₂₂ = 54 @ 10.6 μm
Syngony	Hexagonal system, 6m2 point group
Lattice parameters(Å)	a=3.74, c=15.89
Refractive index	n _o =2.6975, n _e =2.3745 @ 10.6 μm
	n _o =2.7233, n _e =2.3966 @ 5.3 μm
Damage threshold	30 MW/cm ² @1064 nm (t=10 ns)
Departure angle	4.1° @5.3 μm
Moh's hardness	2
Density	5.03g/cm ³
Band-gap width (at 300K)	2.2eV

Product Parameter:

Dimensional tolerance	±0.1mm
Optical aperture	≥90%
Wavefront distortion	≤λ/8 @ 633nm
Flatness	λ/8 @ 633nm
Finish	20/10
Parallelism	≤30"
Verticality	≤15 '
Angular deviation	Δθ≤0.25°, Δφ≤0.25°