AgGaSe2 crystals

AGSe AgGaSe2 crystals have band edges at 0.73 and 18 μm. Its useful transmission range (0.9–16 μm) and wide phase matching capability provide excellent potential for OPO applications when pumped by a variety of different lasers. Tuning within 2.5–12 μm has been obtained when pumping by Ho:YLF laser at 2.05 μm; as well as non-critical phase matching (NCPM) operation within 1.9–5.5 μm when pumping at 1.4–1.55 μm. AgGaSe2 (AgGaSe2) has been demonstrated to be an efficient frequency doubling crystal for infrared CO2 lasers radiation.

Dimensions:
Standard cross sections are 8x 8mm, 5 x 5mm, Crystal length range from 1 to 30 mm. Custom sizes are also available on request.

AgGaSe2 crystals

Applications:

- Generation second harmonics on CO and CO2 - lasers
- Optical parametric oscillator
- Different frequency generator to middle infrared regions up to 18 um.
- Frequency mixing in the middle IR region

Basic properties	
Crystal Structure	Tetragonal
Cell Parameters	a=5.992 Å, c=10.886 Å
Melting Point	851 °C
Density	5.700 g/cm3
Mohs Hardness	3-3.5
Absorption Coefficient	<0.05 cm-1 @ 1.064 μm<0.02 cm-1 @ 10.6 μm
Relative Dielectric Constant @ 25 MHz	ε11s=10.5ε11t=12.0
Thermal Expansion Coefficient	||C: -8.1 x 10-6 /°C⊥C: +19.8 x 10-6 /°C
Thermal Conductivity	1.0 W/M/°C

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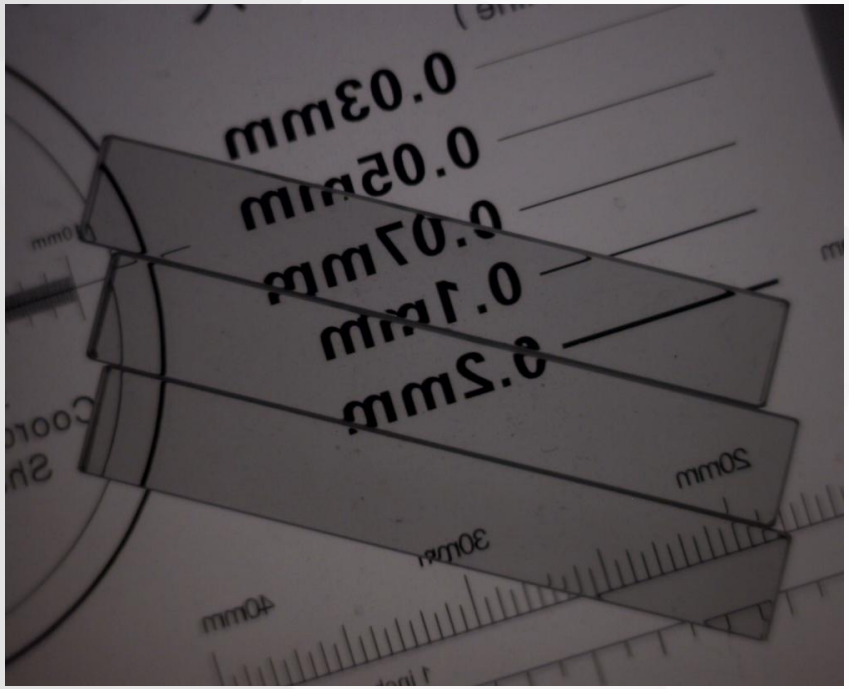

Interal quality under IR camera

Linear Optical Properties		
Transparency Range	0.73-18.0 um	
Refractive Indices@ 1.064 um@ 5.300 um@ 10.60 um	no2.70102.61342.5912	ne2.67922.58082.5579
Thermo-Optic Coefficient	dno/dt=15.0 x 10-5/°Cdne/dt=15.0 x 10-5/°C	
Sellmeier Equations(λ in um)	no2=4.6453+2.2057/(1-0.1879/λ2)+1.8577/(1-1600/λ2)ne2=5.2912+1.3970/(1-0.2845/λ2)+1.9282/(1-16007/λ2)	

Nonlinear Optical Properties	
NLO Coefficients @ 10.6 um	d36=d24=d15=39.5 pm/V
Linear Electro-optic Coefficients	Y41T=4.5 pm/VY63T=3.9 pm/V
Damage Threshold @ ~ 10 ns, 1.064 um	20-30 MW/cm2(surface)

AgGaSe2 crystals

Technical Properties	
Dimension tolerance	(W +/-0.1 mm) x (H +/-0.1 mm) x (L + 1 mm/-0.5 mm)
Clear aperture	> 90% central area
Surface quality	30-20 before coating 60-40 after coating
Flatness	λ/8 @ 633 nm for T>=1 mm
Surface Quality	Scratch/dig 60-40 after coating
Parallelism	better than 30 arc seconds
Perpendicularity	10 arc minutes
Orentation accuracy	<30''