

Gallium Arsenide (GaAs)

The rugged CO₂ alternative — six times harder than ZnSe.

PHYSICAL PROPERTIES	
Crystal structure	Cubic zincblende
Density	5.32 g/cm ³
Bulk resistivity	> 10 ⁷ Ω-cm (semi-insulating)
OPTICAL PROPERTIES	
Useful transmission range	1 – 15 μm
Refractive index	3.27 @ 10.6 μm
dn/dT	+149 × 10 ⁻⁶ /K
THERMAL PROPERTIES	
Thermal conductivity	52 W/m·K
Specific heat	0.325 J/g·K
Thermal expansion (CTE)	5.7 × 10 ⁻⁶ /K
MECHANICAL PROPERTIES	
Young's modulus	82.7 GPa
Knoop hardness	750 kgf/mm ²
Poisson's ratio	0.31

Typical Applications

CO₂ laser optics in dusty, high-spatter metal-cutting environments; IR windows requiring mechanical robustness and thermal-shock tolerance.

Fabrication & Specification Notes

No visible transmission — red aiming beams will not pass. Slightly higher absorption than laser-grade ZnSe; often outlives ZnSe several times over in harsh shops.

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