

Global Source for IR Optics and Materials



Zinc Selenide (ZnSe)

Vital is one of a select few companies in the world producing laser grade Zinc Selenide using the Chemical Vapor Deposition (CVD) process. With professional experience and expertise, Vital has been supplying the highest quality Zinc Selenide blank material and finished optics to satisfied customers domestically and internationally. With its low absorption at 10.6 microns, Zinc Selenide is a preferred material for use in CO₂ laser systems. Zinc Selenide is used for focusing lenses, protective windows, output couplers and beam expanders. Zinc Selenide is also found in many opto-electronic applications. Its wide bandgap makes it appropriate for use in detectors as well as emitters.

Its index of refraction, homogeneity and uniformity offers excellent optical performance for use as protective windows or optical elements in high-resolution Forward Looking Infrared (FLIR) thermal imaging equipment.

Zinc Selenide Optics

Vital continues to expand its product offerings to meet the requests from CO₂ laser manufacturers, laser product distributors, defense contractors, and end-consumers for high-quality infrared optics at an affordable price. With optical design engineering, optics fabrication and thin-film coating capabilities, Vital is able to offer optics from initial design stage to finished optical elements.

This material can also be used for high power laser systems, marking/scanning laser systems, thermal imaging and defense systems, as well as thermometry and spectroscopy applications in the medical laser field.

Vital offers blanks in diameters ranging from 5.5mm to 305mm in diameter and thicknesses from 1mm to 20mm. We also offer diameter and thickness toleranced blanks, shaped/generated blanks, polished optics, and a number of different coatings for Zinc Selenide optical elements.

Specification

Physical Properties		Optical Properties		Wavelength, μm	Refractive Index
Density, (20° C)	5.27 g/cm ³	Max Transmittance 1 μm	69.2%	2	2.44672
Hardness (20° C)	105 kg/mm ²	Max Transmittance 10 μm	70.9%	3	2.43804
Flexural Strength (20° C)	750 psi	Absorption Coefficient	$\times 10^{-3} \text{ cm}^{-1}$	4	2.43363
Flexural Strength (260° C)	10,500 psi	0.63 μm	100	5	2.43001
Young's Modulus (20° C)	10.2 Mpsi	2.7 μm	1.5	6	2.42635
Young's Modulus (260° C)	8.9 Mpsi	3.8 μm	1.5	7	2.42232
Thermal Conductivity (20° C)	0.16 W/cm-k	5.3 μm	0.4	8	2.41783
Thermal Conductivity (260° C)	0.08 W/cm-k	10.6 μm	0.5	9	2.41275
Thermal Expansion (20-170° C)	7.57 ppm/K	Index of Inhomogeneity	3 ppm	10	2.40707
Specific Heat Capacity (20° C)	0.339 J/g-k	10.6 μm		11	2.40067
Grain Size	50-70 microns	Thermo-optic Coefficient	$\times 10^{-5} \text{ K}^{-1}$	12	2.39354
Dielectric Constant (20° C)	8.976	0.63 μm	10.6	13	2.38571
Loss Tangent (20° C)	0.0017	1.15 μm	7.0	14	2.37689
Poisson's Ratio (20° C)	0.28	3.39 μm	6.2		
		10.6 μm	6.1		

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