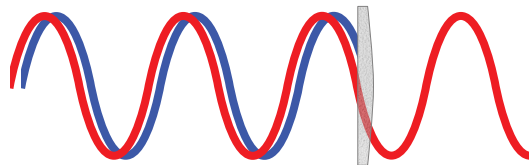


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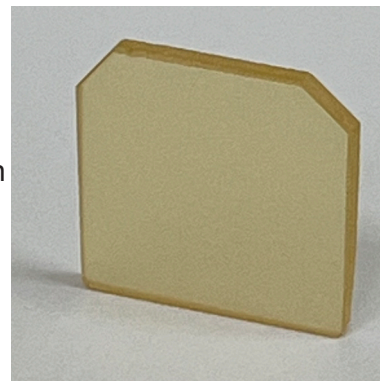
Zinc Sulfide (ZnS)



Zinc Sulfide (ZnS) is a versatile II-VI compound semiconductor with exceptional optical and mechanical properties.

In the optical domain, ZnS's wide transmission range, from the visible to the infrared spectrum, is ideal for high-performance optical components. It offers low absorption, high refractive index, exceptional hardness, abrasion resistance, and chemical inertness.

Good applications for this material are lenses, windows, and prisms, scratch-resistant displays, and corrosion-resistant coatings for demanding applications such as aerospace instrumentation, night vision systems, and laser optics.



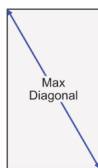
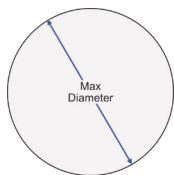
ZnS's luminescent properties make it a candidate for next-generation optoelectronic devices. Its wide bandgap and high quantum efficiency are useful for efficient light-emitting diodes (LEDs), flat-panel displays, and scintillation detectors.

Size Availability: Our ZnSe substrates and finished parts are available in the following sizes

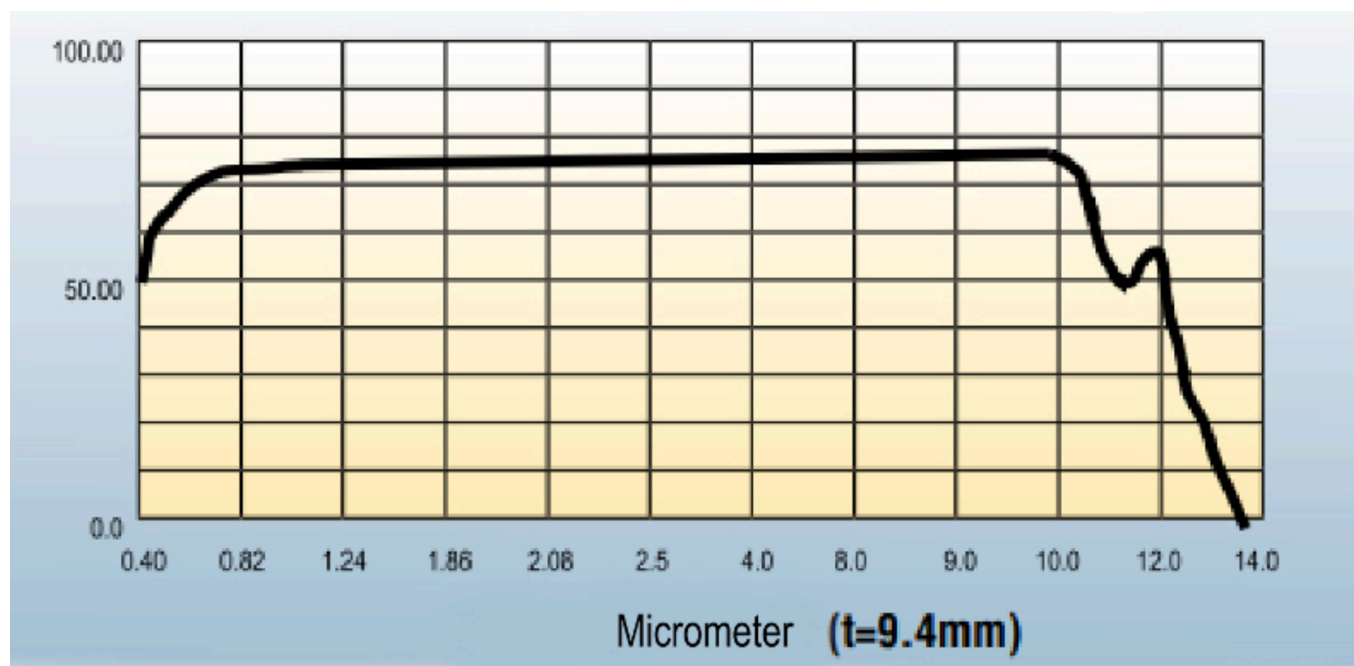
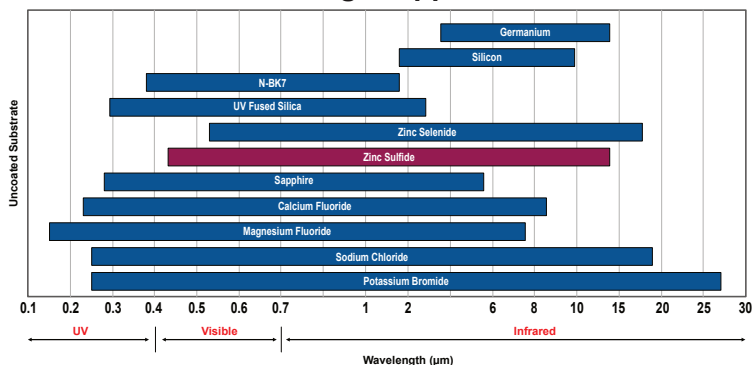
Diameter: Up to 400mm

Diagonal: Up to 400mm

Thickness: Up to 20mm

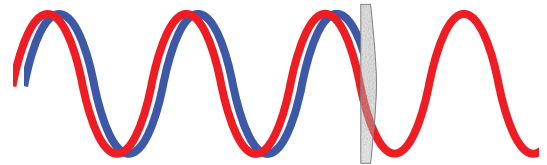


Wavelength Application



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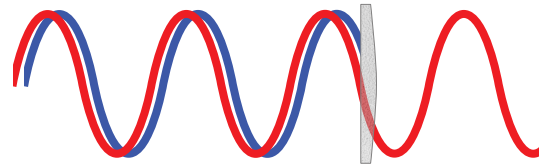
ZnS Transparent Data



Zinc Sulfide (Transparent) Properties			
Optical Properties		Flexural Strength (modulus of rupture)	
10% Transmission (t=6mm)	0.37 - 14 μm	4pt. Loading (psi)	1.09×10^3
Refr Index Inhomogeneity: ($\Delta n/n$) (ppm @0.6328 μm)	<20	4pt. Loading (Mpa)	75
Thermo-optic coefficient dn/dt (298-358K)		Disk Bursting (Mpa)	50
$K^{-1}@0.6328\mu\text{m}$	5.43×10^{-5}	Fracture Toughness (critical stress intensity factor, K_{Ic} Value)	
$K^{-1}@1.15\mu\text{m}$	4.21×10^{-5}	(Mpa/m, Vickers, 1g)	1.0
$K^{-1}@3.39\mu\text{m}$	3.87×10^{-5}	Youngs Modulus (elastic modulus)	
Bulk Absorption Coefficient		psi	10.8×10^6
$\text{cm}^{-1}@1.3\mu\text{m}$	6.0×10^{-4}	GPa	74.5
$\text{cm}^{-1}@2.7\mu\text{m}$	1.0×10^{-3}	Poisson's Ratio	0.28
$\text{cm}^{-1}@3.8\mu\text{m}$	6.0×10^{-4}	Thermal Properties	
$\text{cm}^{-1}@5.25\mu\text{m}$	6.0×10^{-3}	Coefficient Thermal Expansion	
$\text{cm}^{-1}@10.6\mu\text{m}$	2.0×10^{-1}	$K^{-1}@273K$	6.3×10^{-6}
Physical Properties		$K^{-1}@373K$	7.0×10^{-6}
Crystal Structure:	Cubic	$K^{-1}@473K$	7.5×10^{-6}
Grain Size (diameter):	20-35 μm	Thermal Conductivity	
Density (g/cm^3 @298K):	4.09	($\text{JK}^{-1}\text{m}^{-1}\text{s}^{-1}$ @298K)	28.4
Resistivity (Ωcm):	$\sim 10^{13}$	Heat Capacity	
Chemical Purity (%):	99.9996	($\text{Jg}^{-1}\text{K}^{-1}$ @273K)	0.474
Hardness Knoop: 50g load (kg/mm^2)	160	($\text{Jg}^{-1}\text{K}^{-1}$ @323K)	0.489
Hardness Vickers: 1kg load (kg/mm^2)	150	($\text{Jg}^{-1}\text{K}^{-1}$ @373K)	0.504
		Thermal Diffusion Coef (m^2s^{-1})	1.46×10^{-5}

INFRARED MATERIALS

ZnS CVD Data



Zinc Sulfide (CVD) Properties			
Optical Properties		Flexural Strength (modulus of rupture)	
10% Transmission (t=6mm)	1.0 - 14 μm	4pt. Loading (psi)	15×10^3
Refr Index Inhomogeneity: ($\Delta n/n$) (ppm @0.6328 μm)	<100	4pt. Loading (Mpa)	74.5
Thermo-optic coefficient dn/dt (298-358K)		Disk Bursting (Mpa)	84
$K^{-1}@0.6328\mu\text{m}$	4.6×10^{-5}	Fracture Toughness (critical stress intensity factor, K_{Ic} Value)	
$K^{-1}@1.15\mu\text{m}$	4.3×10^{-5}	(Mpa/m, Vickers, 1g)	0.81.0
$K^{-1}@3.39\mu\text{m}$	4.1×10^{-5}	Youngs Modulus (elastic modulus)	
Bulk Absorption Coefficient		psi	10.8×10^6
$\text{cm}^{-1}@10.6\mu\text{m}$	2.0×10^{-1}	GPa	74.5
		Poisson's Ratio	0.29
Physical Properties		Thermal Properties	
Crystal Structure:	Cubic	Coefficient Thermal Expansion	
Grain Size (diameter):	2-8 μm	$K^{-1}@273K$	6.6×10^{-6}
Density ($\text{g}/\text{cm}^3 @298K$):	4.09	$K^{-1}@373K$	7.3×10^{-6}
Resistivity (Ωcm):	$\sim 10^{12}$	$K^{-1}@473K$	7.7×10^{-6}
Chemical Purity (%):	99.9996	Thermal Conductivity	
Hardness Knoop: 50g load (kg/mm^2)	200-235	($\text{JK}^{-1}\text{m}^{-1}\text{s}^{-1}@296K$)	16.7
Hardness Vickers: 1kg load (kg/mm^2)	230	Heat Capacity ($\text{Jg}^{-1}\text{K}^{-1}@298K$)	0.469