

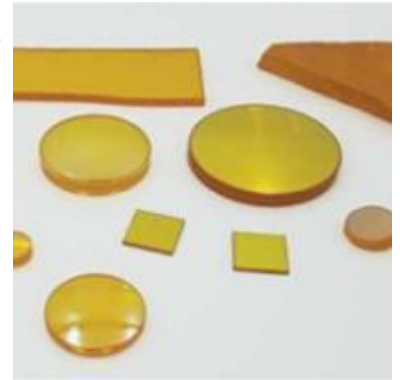
INFRARED MATERIALS

Zinc Selenide (ZnSe)

Zinc Selenide (ZnSe) is a revolutionary II-VI compound semiconductor material with exceptional optical and electrical properties. ZnSe is used for cutting-edge applications in optics, electronics, and energy technologies.

In the realm of optics, ZnSe's wide transparency window, spanning from the visible to the far-infrared spectrum, makes it an ideal material for advanced optical components. Its high refractive index and low dispersion enable the development of superior lenses, windows, and prisms for applications in laser systems, thermal imaging, and spectroscopy.

ZnSe's unique properties also make it a promising material for high-performance optoelectronic devices. Its wide bandgap and high electron mobility enable efficient light-emitting diodes (LEDs), photodetectors, and solar cells.

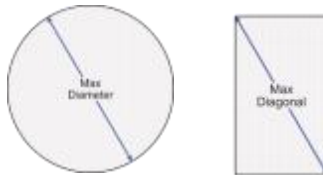


Size Availability: Our ZnSe substrates and finished parts are available in the following sizes

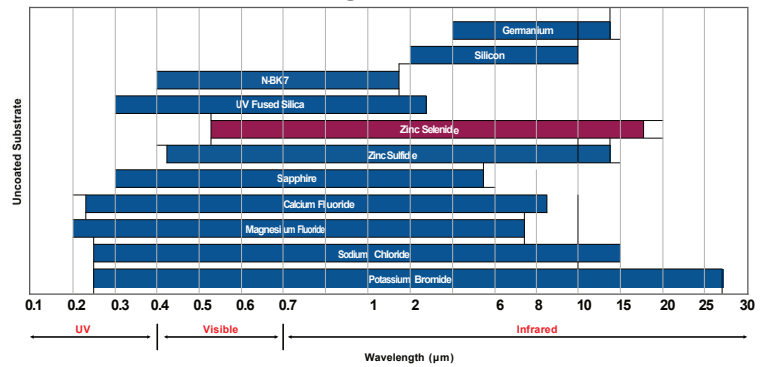
Diameter: Up to 200mm

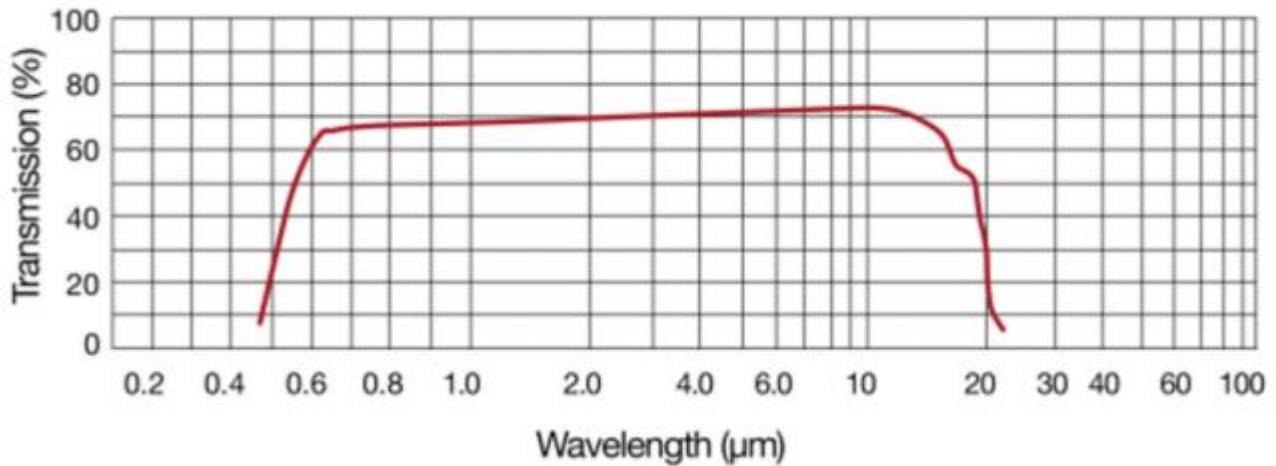
Diagonal: Up to 200mm

Thickness: Up to 20mm



Wavelength Application





Email: sales@htoptics-tech.com 1321 Upland Dr. #7017 Houston, TX 77043 USA

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Zinc Selenide (ZnSe) Data

Zinc Selenide Properties			
Optical Properties		Flexural Strength (modulus of rupture)	
10% Transmission (t=6mm)	0.50 - 22 μm	4pt. Loading (psi)	8.0x10 ³
Refr Index Inhomogeneity: (Δ n/n) (ppm @0.6328μm)	<3	4pt. Loading (Mpa)	55
Thermo-optic coefficient dn/dt (298-358K)			
K ⁻¹ @0.6328μm	1.07x10 ⁻⁴	Fracture Toughness (critical stress intensity factor, K _{1c} Value)	
K ⁻¹ @1.15μm	7.0x10 ⁻⁵	(Mpa/m, Vickers, 100g)	0.5
K ⁻¹ @3.39μm	6.2x10 ⁻⁵	Youngs Modulus (elastic modulus)	
K ⁻¹ @10.6μm	6.1x10 ⁻⁵	psi	9.75x10 ⁶
Bulk Absorption Coefficient		GPa	67.2
cm ⁻¹ @1.3μm	5.0x10 ⁻³	Poisson's Ratio	
cm ⁻¹ @2.7μm	7.0x10 ⁻⁴	0.28	
cm ⁻¹ @3.8μm	4.0x10 ⁻⁴		

cm⁻¹@5.25μm	4.0x10⁻⁴		
cm⁻¹@10.6μm	5.0x10⁻⁴	Thermal Properties	
Physical Properties		Coefficient Thermal Expansion	
Crystal Structure:	Cubic	K⁻¹@273K	7.1x10⁻⁶
Grain Size (diameter):	50-70μm	K⁻¹@373K	7.8x10⁻⁶
Density (g/cm³ @298K):	5.27	K⁻¹@473K	8.3x10⁻⁶
Resistivity (Ω . cm):	~10¹²	Thermal Conductivity (JK⁻¹m⁻¹s⁻¹@298K)	18
Chemical Purity (%):	99.9996	Heat Capacity (Jg⁻¹K⁻¹@298K)	0.339
Hardness Knoop: 50g load (kg/mm²)	110		
Hardness Vickers: 1kg load (kg/mm²)	112		



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ZnSe Thermo Optic Data

Zinc Selenide (CVD) Thermo Optic Coefficient $dn/dt (10^{-5}K^{-1})$				
Temp	Wavelength (μm)			
$^{\circ}C$	0.6328	1.15	3.39	10.6
-180	7.6	5.4	5.0	4.9
-160	8.2	5.7	5.2	5.1
-140	8.7	6.0	5.4	5.4
-120	9.1	6.3	5.6	5.5
-100	9.4	6.5	5.8	5.7
-80	9.7	6.6	5.9	5.8
-60	10.0	6.7	6.0	5.9
-40	10.2	6.8	6.1	6.0
-20	10.3	6.9	6.1	6.0
0	10.5	7.0	6.2	6.1
20	10.6	7.0	6.2	6.1
40	10.7	7.0	6.2	6.1
60	10.8	7.1	6.3	6.1
80	10.9	7.1	6.3	6.2
100	11.0	7.2	6.3	6.2
120	11.1	7.2	6.4	6.3
140	11.3	7.3	6.4	6.3
160	11.5	7.4	6.5	6.4
180	11.8	7.6	6.6	6.6
200	12.1	7.8	6.7	6.7