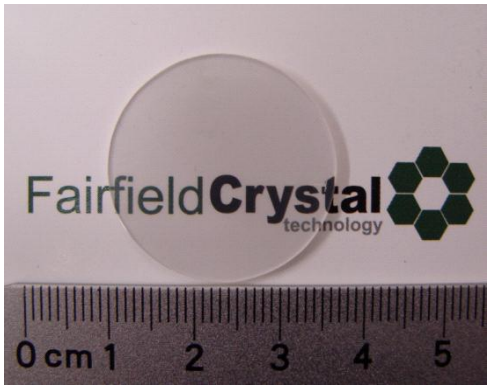
Single Crystal Zinc Sulfide (ZnS)



Fairfield Crystal Technology uses a unique process to produce single crystal Zinc Sulfide (ZnS). Our single crystal material is a very high crystalline quality material with dislocation densities less than $50cm^{-2}$. ZnS is part of a group of II-VI large bandgap semiconductors with a band gap of 3.6eV that is useful for fabricating a variety of semiconductor devices for commercial and military applications. II-VI-based UV detectors that are visible or solar-blind, with high detection efficiencies, have many important applications that require detection of weak UV radiation against a strong visible or infrared background. These UV detectors have a wide range of civil and defense applications, such as chemical and biological analysis (ozone, pollutants, and chemical and biological agents), flame detection, UV exposure control in photo-lithographic and binder curing processes, UV communications in space, imaging of UV-emitting objects in astronomy.

Substance	Form	Diameter Range	Thickness Range	Surface Finish
Zinc Sulfide (ZnS)	**Single Crystal**	5 to 25 mm*	0.250 – 0.500mm*	Optical polish**

*Special orders available

**Standard finish – other finish available upon request

ELECTRICAL/OPTICAL PROPERTIES	
Bandgap (eV)	3.6
Transmission Range (thickness = 6.0mm)	0.36 to 12.0 microns
Bulk Absorption Coefficient (@ 10.6µm)	$<0.15\ cm^{-1}$
Refractive Index Homogeneity (@ 632.8nm)	<5ppm
Bubbles & Inclusions	none
Crystal Structure	Hexagonal (2H)

PHYSICAL PROPERTIES	
Chemical Purity (%)	99.999
Lattice Constant (Å)	a-axis = 3.814 c-axis = 6.258
Knopp Hardness (kg/mm^2)	180 – 205
Density (gm/cm^3)	4.09
Poisson Ratio (µ)	0.270
Young's Modulus [GPa]	82.0

THERMAL PROPERTIES	
Thermal Conductivity (@ 20°C - W/cm/°C)	0.272
Specific Heat (J/g/°C)	0.525
Thermal Diffusity (m^2s^{-1})	1.3×10^{-5}

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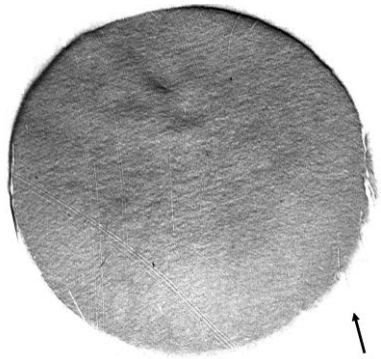

Typical Synchrotron x-ray topography result from a 25mm single crystal of ZnS shows that there are no polytype inclusions in our ZnS single crystals. Also the synchrotron X-ray topography result confirmed that the crystalline quality of Fairfield Crystal's ZnS single crystals are extremely high.

Single Crystal ZnS x-ray image

Fabrication/Polishing

ZnS crystal material is a softer material that can be easily be sliced and polished to an epi-ready surface using standard diamond and pitch polish techniques. Fairfield Crystal provides these slicing and polishing services. Our expertise in crystal growth and understanding of the crystal structure gives us an advantage and enables us to offer superior polished surfaces and surface figure to customers' rigorous specifications. For other specifications or specific requirements please contact our sales team.

Hazard Labeling: Not regulated by Department of Transportation (DOT)
Shipping Classification: UPS or FedEx: Ground, Air
Fairfield Crystal Technology will be pleased to quote you price and delivery.

Contact us
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