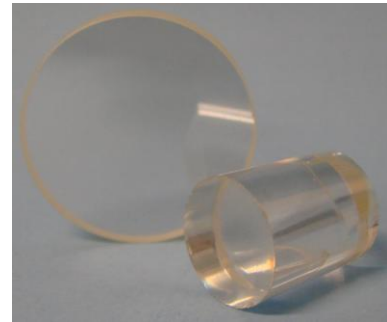


## Zinc Sulfide (ZnS)

Fairfield Crystal Technology uses a unique patented process to produce our BroadTran<sup>®</sup> clear multispectral Zinc Sulfide (ZnS) crystals. We produce large grain crystal material that reduces scatter and offers lower absorption. Our crystal material has a number of important optical properties including excellent transmittance from 0.36 to 12 $\mu$ m; very low scattering, low absorption and high refractive-index of homogeneity. BroadTran<sup>®</sup> ZnS broad wavelength spectrum make it ideal solution for FLIR and other applications such as high-performance common aperture systems in commercial and military use.



Substance	Form	Diameter Range	Thickness Range	Transmission Range ( $\mu$ m)	Surface Finish
Zinc Sulfide (ZnS)	Multigrain Crystal	5 to 50mm	1 to 50mm*	0.36 to 12.0	Fine Ground**

\*Special orders available

\*\*Standard finish – other finish available upon request

### OPTICAL PROPERTIES

Transmission Range (thickness = 6.0mm)	0.36 to 12.0 microns
Bulk Absorption Coefficient (@ 10.6 $\mu$ m)	<0.20 cm <sup>-1</sup>
Refractive Index Homogeneity (@ 632.8nm)	<18 ppm
Bubbles & Inclusions	none
Crystal Structure	Cubic
Grain Size	> 5mm (typ.)

### PHYSICAL PROPERTIES

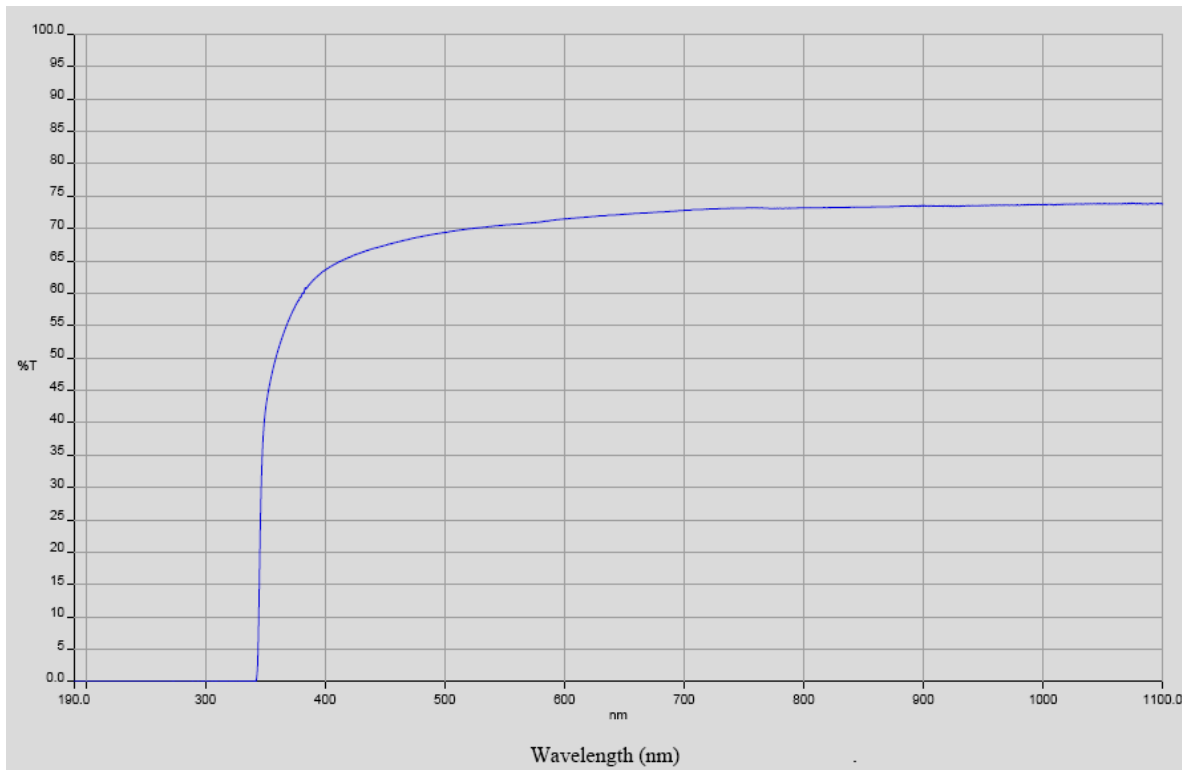
Chemical Purity (%)	99.9998
Knopp Hardness (kg/mm <sup>2</sup> )	180 – 205
Density (gm/cm <sup>3</sup> )	4.09
Poisson Ratio ( $\mu$ )	0.270
Young's Modulus [GPa]	82.0

### THERMAL PROPERTIES

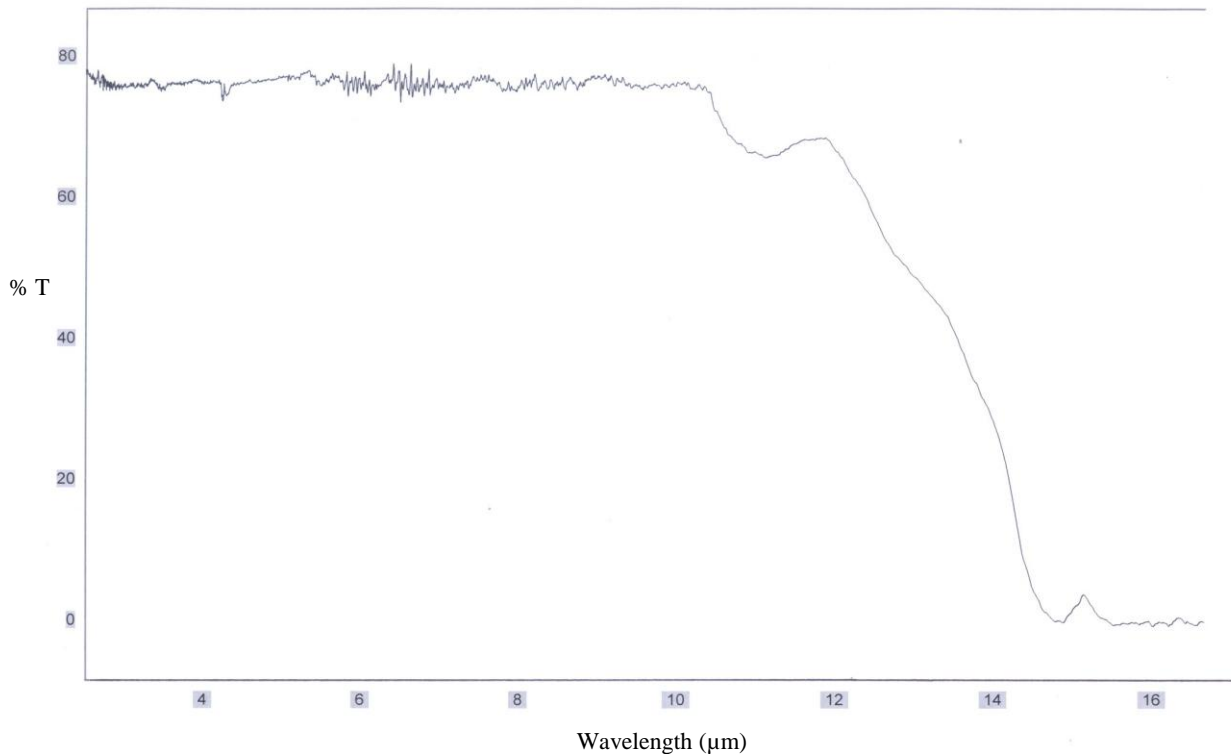
Thermal Conductivity (@ 20°C - W/cm/°C)	0.272
Specific Heat (J/g/°C)	0.525
Thermal Diffusivity (m <sup>2</sup> s <sup>-1</sup> )	1.3 x 10 <sup>-5</sup>

**REFRACTIVE INDICES**

<u>Wavelength (μm)</u>	<u>Index</u>	<u>Wavelength (μm)</u>	<u>Index</u>
0.4047	2.54515	1.1287	2.28485
0.4358	2.48918	1.5296	2.27191
0.4678	2.44915	2.0581	2.26442
0.4800	2.43691	3.0000	2.25772
0.5086	2.41279	3.5000	2.25498
0.5461	2.38838	4.0000	2.25231
0.5876	2.36789	4.5000	2.24955
0.6438	2.34731	5.0000	2.24661
0.6678	2.34033	8.0000	2.22334
0.7065	2.33073	9.0000	2.21290
0.7800	2.31669	10.000	2.20084
0.7948	2.31438	11.250	2.18317
0.8521	2.30659	12.000	2.17101
0.9843	2.30183	13.000	2.15252
1.0140	2.29165		



Broadtran® ZnS Transmission Chart for UV to NIR



Broadtran® ZnS Transmission Chart for NIR to FIR

### Fabrication

ZnS crystal material can be polished using diamond turning or standard pitch polish. Fairfield Crystal also provides 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.

### Polishing Capabilities

Surface figure:  $1/20\lambda$  @ 10.6μm  
 Surface quality: 20/10 S/D, <1 nm RMS  
 Parallelism: < 10 arc seconds  
 Sizes: 5.0 to 50.0 mm Diameter

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

Sales email: [atimmerman@fairfieldcrystal.com](mailto:atimmerman@fairfieldcrystal.com)  
 Telephone: (860) 354-2111 ext 200  
 Fax: (860) 354-3093