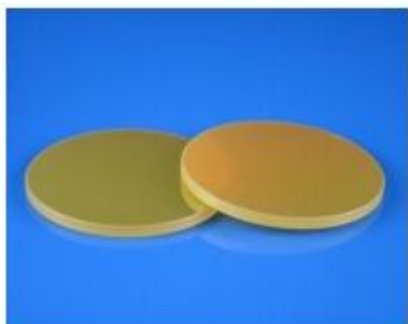


Zinc Sulfide (ZnS) Windows


Features:

- Good transmission from 0.4 to 14 μ m for multi-spectrum grade ZnS
- Good choice for aircraft applications

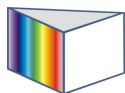
Descriptions:

ZnS or Zinc Sulphide crystals grown by chemical vapor deposition (or CVD) exhibits exceptional fracture strength and hardness leading to its frequent choice for military applications or other harsh environments. This material is often used in the LWIR 7 to 14 microns region of thermal imaging. Its high resistance to rain erosion and high-speed dust and particulate abrasion makes it particularly suitable for exterior IR windows on aircraft frames.

Hangzhou Shalom EO provides the ZnS windows of IR grade and Cleartran or multi-spectrum grade materials, the AR/AR coating is made to increase the transmission of the windows.

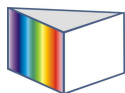
Specifications:

Materials	CVD ZnS Crystals, FLIR Grade or Cleartran	Diameter Range	~ 250mm
Aperture	>90%	Dimension Tolerance	+0.0/-0.2mm
Thickness Tolerance	+/-0.1mm	Surface Quality	60/40 S/D
Parallelism	1 arc minute	Chamfer	0.3-0.5mmx45degree
Coating	AR/AR coating@7-14 μ m		



Physical and Optical Properties:

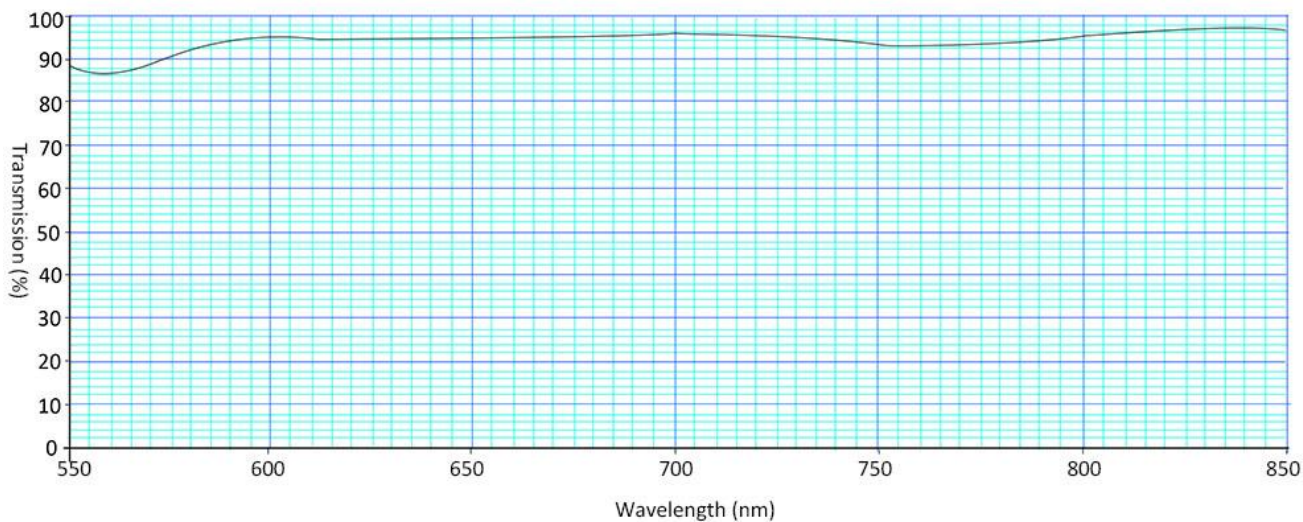
Transmission Range	0.37 to 13.5 μm	Refractive Index	2.20084 at 10 μm
Reflection Loss	24.7% at 10 μm (2 surfaces)	Absorption Coefficient	0.0006 cm^{-1} at 3.8 μm
Reststrahlen Peak	30.5 μm	dn/dT	$+38.7 \times 10^{-6} / ^\circ\text{C}$ at 3.39 μm
$dn/d\mu = 0$	n/a	Density	4.09 g/cc
Melting Point	1827 $^\circ\text{C}$ (See notes below)	Thermal Conductivity	27.2 $\text{W m}^{-1} \text{K}^{-1}$ at 298K
Thermal Expansion	$6.5 \times 10^{-6} / ^\circ\text{C}$ at 273K	Hardness	Knoop 160 with 50g indenter
Specific Heat Capacity	515 $\text{J Kg}^{-1} \text{K}^{-1}$	Dielectric Constant	88
Youngs Modulus (E)	74.5 GPa	Shear Modulus (G)	n/a
Bulk Modulus (K)	n/a	Elastic Coefficients	Not Available
Apparent Elastic Limit	68.9 MPa (10,000 psi)	Poisson Ratio	0.28
Solubility	$65 \times 10^{-6} \text{ g}/100\text{g water}$	Molecular Weight	97.43
Class/Structure	HIP poly-crystalline cubic, ZnS, F42m		



Curves:

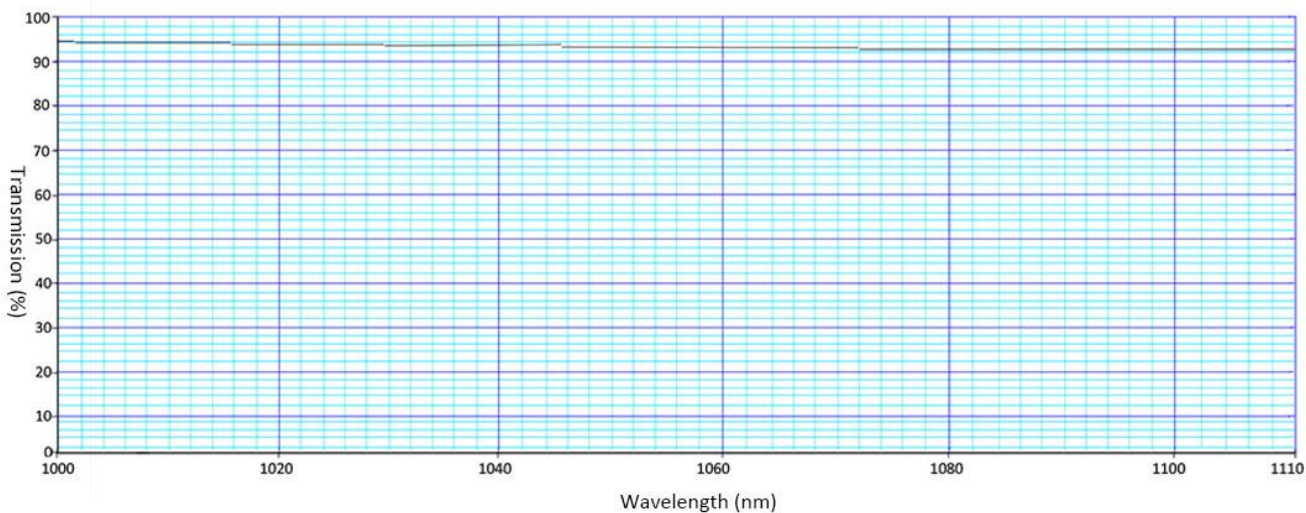
1. Transmission of 3mm Thickness ZnS Cleartran Windows at 550-850nm

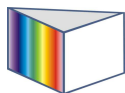
Transmission of 3mm Thickness ZnS Cleartran Windows at 550-850nm



2. Transmission of 3mm Thickness ZnS Cleartran Windows at 1000-1100nm

Transmission of 3mm Thickness ZnS Cleartran Windows at 1000-1100nm





3. Transmission of 3mm Thickness ZnS Windows at 8-12 micro

Transmission of 3mm Thickness ZnS Windows at 8-12 micro

