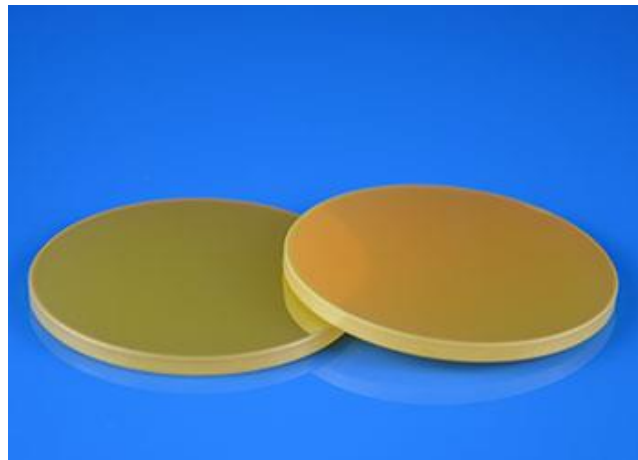


## Zinc Sulfide (ZnS) Windows

ZnS or **Zinc Sulphide** crystals grown by chemical vapor desposition (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.

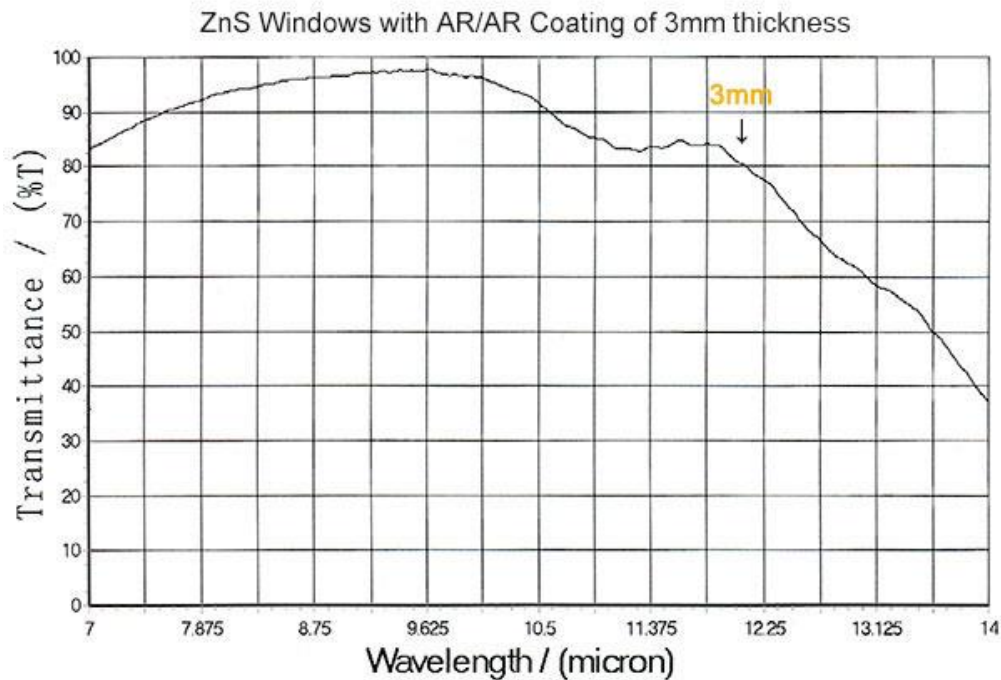
Hangzhou Shalom EO provides the **ZnS windows** of IR grade and Cleartran or multi-spectrum grade materials, the AR/AR coating is made to increase the transmission of the windows.



## Specifications

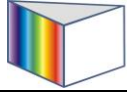
Specifications	
Materials	CVD ZnS crystals, IR grade or Cleartran grade
Diameter Range	~ 250mm
Aperture	>90%
Dimension tolerance	+0.0/-0.2mm
Thickness tolerance	+/-0.2mm
Surface Quality	60/40 S/D
Parallelism	1 arc minute
Chamfer	0.3-0.5mmx45degree
Coating	AR/AR coating@7-14 $\mu$ m

### ZnS Windows with AR/AR Coating of 3mm thickness



## Basic Properties

Physical and optical properties	
Transmission Range :	0.37 to 13.5 $\mu\text{m}$
Refractive Index :	2.20084 at 10 $\mu\text{m}$
Reflection Loss :	24.7% at 10 $\mu\text{m}$ (2 surfaces)
Absorption Coefficient :	0.0006 $\text{cm}^{-1}$ at 3.8 $\mu\text{m}$
Reststrahlen Peak :	30.5 $\mu\text{m}$
$dn/dT$ :	$+38.7 \times 10^{-6} / ^\circ\text{C}$ at 3.39 $\mu\text{m}$
$dn/d\mu = 0$ :	n/a
Density :	4.09 g/cc
Melting Point :	1827 $^\circ\text{C}$ (See notes below)
Thermal Conductivity :	27.2 W m $^{-1}$ 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 J Kg $^{-1}$ 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 :	$65 \times 10^{-6}$ g/100g water
Molecular Weight :	97.43
Class/Structure :	HIP polycrystalline cubic, ZnS, F42m



**Shalom EO**  
Crystals, optics and components

Hangzhou Shalom Electro-optics Technology Co., Ltd.

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