## **Optical Glasses**

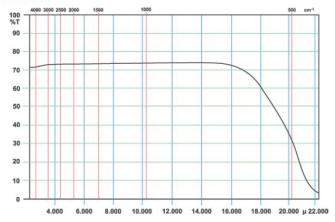


## **Optical material / crystals (Infrared)**

**Material / Specification:** Zinc Selenide for 0.6µm to 21µm transmission **Range / Description:** OPMI-ZINC SELENIDE

It is used as an infrared optical material with a remarkably wide transmission wavelength range (0.6  $\mu$ m to 20  $\mu$ m). Zinc selenide can slowly react with atmospheric moisture if poorly polished, but this is not generally a serious problem. Except where optics are use in spectroscopy or at the Brewster angle, antireflection or beamsplitting coatings are generally employed. It is one of the materials of choice for CO<sub>2</sub> laser optics operating at 10.6  $\mu$ m.

## **Internal Transmittance**



Zinc Selenide ZnSe

Internal Transmittance $t_i(\lambda)$ vs. wavelength $\lambda$											
λ,мкм	0.2	0.5	1.0	3.0	5.0	7.00	9.0	10	12	15	20
τ <sub>i</sub> (λ)	-	0.65	0.76	0.94	0.97	0.99	0.99	0.99	0.98	0.90	0.16

Refra	Refractive Index n vs. Wavelength $\lambda$															
λ, ΜΚΜ	0.2	0.5	1.0	2.0	3.0	5.0	7.0	8.0	9.0	10	11	12	12.5	15	20	30
n(λ)	-	2.67	2.48	2.44	2.43	2.43	2.42	2.41	2.41	2.40	2.40	2.39	2.38	2.36	1.38	

<b>Optical Properties</b>							
Transmission Range	0.6 to 21.0						
Refractive Index	2.4028 at 10.6						
Refractive Loss	29.1% at 10.6						
Crystal/Class Structure	HIP polycrystalline cubic, ZnS, F43m						
Cleavage Plane	n/a						
Thermal Properties							
Thermal Expansion	7.1 x 10 <sup>-</sup> /°C at 273K						
Thermal Conductivity	18 W m <sup>-1</sup> K <sup>-1</sup> at 298K						
Melting Point	1525°C						
Specific Heat Capacity	339 J Kg <sup>-1</sup> K <sup>-1</sup>						

Density	5.27 g/cc
Hardness (Knoop)	120 with 50g indenter
Youngs Modulus	67.2 GPa
Shear Modulus	n/a
Bulk Modulus	40 GPa
Poisson Ratio	0.28
Elastic Limit	2.4 MPa (350 psi)
Molecular Weight	144.33

Chemical Properties	
Solubility	0.001g/100g water

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