

Zinc Sulfide (ZnS) — FLIR & Multispectral Grades

Standard (FLIR) grade for rugged LWIR windows; Multispectral/Cleartran-type grade for VIS–LWIR common-aperture systems.

PHYSICAL PROPERTIES	
Crystal structure	Cubic zincblende (CVD polycrystalline)
Density	4.08 g/cm ³
Bulk resistivity	~10 ¹² Ω·cm
OPTICAL PROPERTIES	
Useful range — FLIR grade	0.4 – 12 μm (practical LWIR use 8–12 μm)
Useful range — Multispectral	0.37 – 14 μm
Refractive index	2.192 @ 10.6 μm
dn/dT @ 10.6 μm	+38.7 × 10 ⁻⁶ /K
THERMAL PROPERTIES	
Thermal conductivity	16.7 (FLIR) / 27 (MS) W/m·K
Specific heat	~0.47 J/g·K
Thermal expansion (CTE)	7.6 × 10 ⁻⁶ /K
MECHANICAL PROPERTIES	
Young's modulus	74.5 (FLIR) / ~87.6 (MS) GPa
Knoop hardness	~230 (FLIR) / ~160 (MS) kgf/mm ²
Poisson's ratio	0.29
Rupture modulus	~100 (FLIR) / ~69 (MS) MPa

Typical Applications

LWIR FLIR windows and domes exposed to sand and rain erosion (FLIR grade); dual-band and VIS-through-LWIR sensor windows and common-aperture optics (Multispectral grade).

Fabrication & Specification Notes

Choose FLIR grade for erosion resistance and strength; choose Multispectral when the band must extend into the visible or minimum scatter is required.

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