Germanium (Ge)

Custom sizes and specifications are available

CRYSTALLOGRAPHIC

Syngony	Cubic
Symmetry Class	m3m
Lattice Constants, Angstrom	a=5.657 c=a
Cleavability	(111), non-perfect

OPTICAL

Refractive Index at $\mathbf{n}_{10.6}$	4.0034
Refractive Index $\mathbf{n}_{8.0}$ -$\mathbf{n}_{12.5}$	0.0036
Thermal Coefficient of Refractive Index at 3.39 microns for +/–60 deg C	35-40 x 10^{-5}
Transmission Range, microns	2-17

THERMAL

Thermal Linear Expansion, deg C^{-1} for +/–60 deg C	(5.1...5.8) x 10^{-6}
Thermal Conductivity, W/(m•deg C) at 27 deg C	59.8
Specific Heat Capacity, J/(kg•deg C)	0.310
Melting Point, deg C	937
Absorbance $\mu(\lambda)$, cm^{-1} at 10.6 microns	0.027

MECHANICAL

Density, g/cm^3 at 25 deg C	5.33
Mohs Hardness	6
Vickers Microhardness, Pa	900 x 10^7
Constants of Elastic Compliance, Pa^{-1}	S_{11}=9.69 x 10^{-12} S_{12}=-2.65 x 10^{-12} S_{44}=14.89 x 10^{-12}
Young Modulus (E), Pa	
in <100> direction	10.32 x 10^{10}
in <111> direction	15.56 x 10^{10}
Shear Modulus (G), Pa	
in <100> direction	6.72 x 10^{10}
in <111> direction	4.67 x 10^{10}
Poisson Ratio	0.278

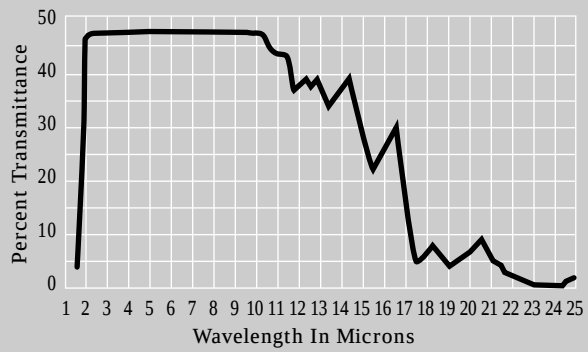
CHEMICAL

Molecular Weight	72.61
Solubility in water, gram/100 cm^3	insoluble

Refr. Index n vs. Wavelength λ

WAVELENGTH, MICRONS	REFRACTIVE INDEX
2.0	4.1079
3.0	4.0446
4.0	4.0242
5.0	4.0153
6.0	4.0106
7.0	4.0076
8.0	4.0053
9.0	4.0047
10.0	4.0040
11.0	4.0031
12.0	4.0029
12.5	4.0024
15.0	4.0017

Internal Transmittance $\tau_i(\lambda)$ vs. Wavelength λ

WAVELENGTH, MICRONS	INTERNAL TRANSMITTANCE
3.0	0.97
5.0	0.97
6.0	0.97
7.0	0.97
8.0	0.97
9.0	0.97
10.0	0.96
12.0	0.70
15.0	0.56

Transmittance τ (λ) vs. Wavelength λ