# Germanium (Ge)

Custom sizes and specifications are available

| CRYSTALLOGRAPHIC | |
|---|---|
| Syngony | Cubic |
| Symmetry Class | m3m |
| Lattice Constants, Angstrom | a=5.657<br>c=a |
| Cleavability | (111), perfect |
| **OPTICAL** | |
| Refractive Index at $n_{10.6}$ | 4.0034 |
| Refractive Index $n_{8.0}$ -$n_{12.5}$ | 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 μ (λ), $cm^{-1}$ at 10.6 microns | 0.027 |
| **MECHANICAL** | |
| Density, g/$cm^3$ at 20 deg C | 4.83 |
| Mohs Hardness | 3 |
| Vickers Microhardness, Pa | 82 x 107 |

| | |
|---|---|
| Young Modulus €, 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 |

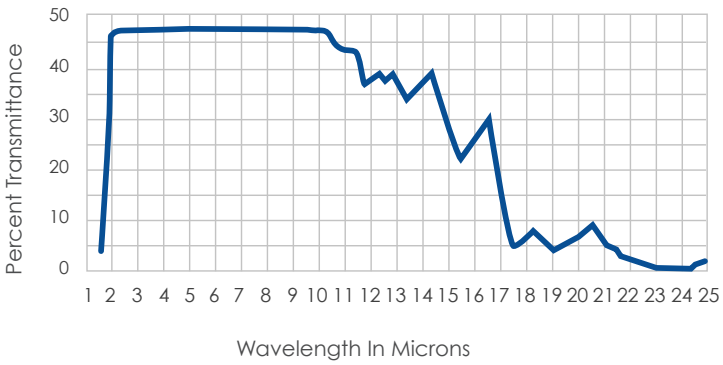
**Refr. Index n vs. Wavelength λ**

| 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 Ti (λ) 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**




**ISP Optics Corp:**
2603 Challenger Tech Court, Suite 100
Orlando, FL 32826
Tel: +800-909-4207
**www.ispoptics.com**

**ISP Optics Latvia:**
24a Ganibu Dambis, korp 13
Riga, LV-1005, Latvia
T: +371 67 323 779
**sales@ispoptics.eu**

A LightPath® COMPANY