GERMANIUM

The most notable physical characteristics of germanium are its high index of refraction and its low optical dispersion. These make it especially useful for wide-angle camera lenses, microscopy, and for the core part of optical fibers. Germanium is the material of choice for systems operating in the far IR wavelength 8-12 microns. It is especially used as the front optic in thermal imaging cameras for passive thermal imaging and for hot-spot detection in military, night vision systems in cars, and fire fighting applications.

ER Precision Optical offers custom crystals, grown to meet your advanced optics specifications.

MATERIAL CHARACTERISTICS

GROWTH METHOD     Czochralski (CZ) grown material (purity)
                   Optical grade (>99.99999%)  
                   Solar grade (>99.999%) 
                   Custom grade—please specify

CRYSTALLINE FORM   Single crystal
                   Poly-crystal

ORIENTATION        <100>, <111>

TYPE               N-type (Antimony)
                   P-type (Gallium)

RESISTIVITY        Customer specific (0.005—500 Ω-cm)
                   Undoped
                   Standard to custom optical ranges
                   Solar applications

SIZES              Full ingots, blanks, flats, wedges up to Ø200 mm
                   Custom machined part dimensions available

PHYSICAL PROPERTIES

Melting Point       938°C
Density             5.33 g/cm³
Thermal expansion coefficient 5.7 x 10.6 per G rad Celsius
Young’s Modulus     102.7 GPa <100>
                   155.6 GPa <111>
Modulus of rupture  72.4 MPa
Hardness            780 Knoop
Intrinsic resistivity 53 Ω-cm

OPTICAL PROPERTIES

Transmission Range  2 to 12µm
                   46% at 25°C