Silicon

Silicon is the second most abundant element in the earth’s crust. Commonly used as substrate material in optical applications for infrared reflectors and windows for IR transmission in the 1.5 - 8 μ region. It is frequently used for laser mirrors because of its high thermal conductivity and low density making it ideal for systems with weight constraints. It is also useful as a transmitter in the 20μ range. Silicon as used within the advanced semiconductor process tools requires consistent high purity materials and tight control of resistivity ranges.

ERPOC produces a range of material grades, from solar grade material to defect free ultra-high purity. We specialize in growing crystals to meet unique characteristics for advanced applications in multiple markets. Our standard optical silicon has a transmission over 53% in the range of 2 - 8 microns and 50 - 100 microns.

Material Characteristics

Growth Method
- Czochralski (CZ) grown material

Purity
- Semiconductor applications (>99.9999999%)
- Optical applications (>99.9999999%)
- Solar applications (>99.9999%)
- Custom application (please specify)

Crystalline Form
- Single crystal
- Poly-crystal

Orientation
- <100>
- <111>

Type
- P-type (boron)
- N-type (phosphorous)

Resistivity
- Customer specific (0.005—500 Ω-cm)
- Undoped
- Typical semiconductor ranges
- Standard & custom optical ranges
- Solar applications

Shapes & Sizes
- Full ingots, blanks, flats, wedges up to Ø250 mm
- Custom machined part dimensions available

Optical Properties

Transmission Range
- 1.2μm to 10μm
- 48 to >100 μm

Refractive Index
- 3.42 at 10 μm

Reflection Loss
- 46% at 10 μm (2 surfaces)