

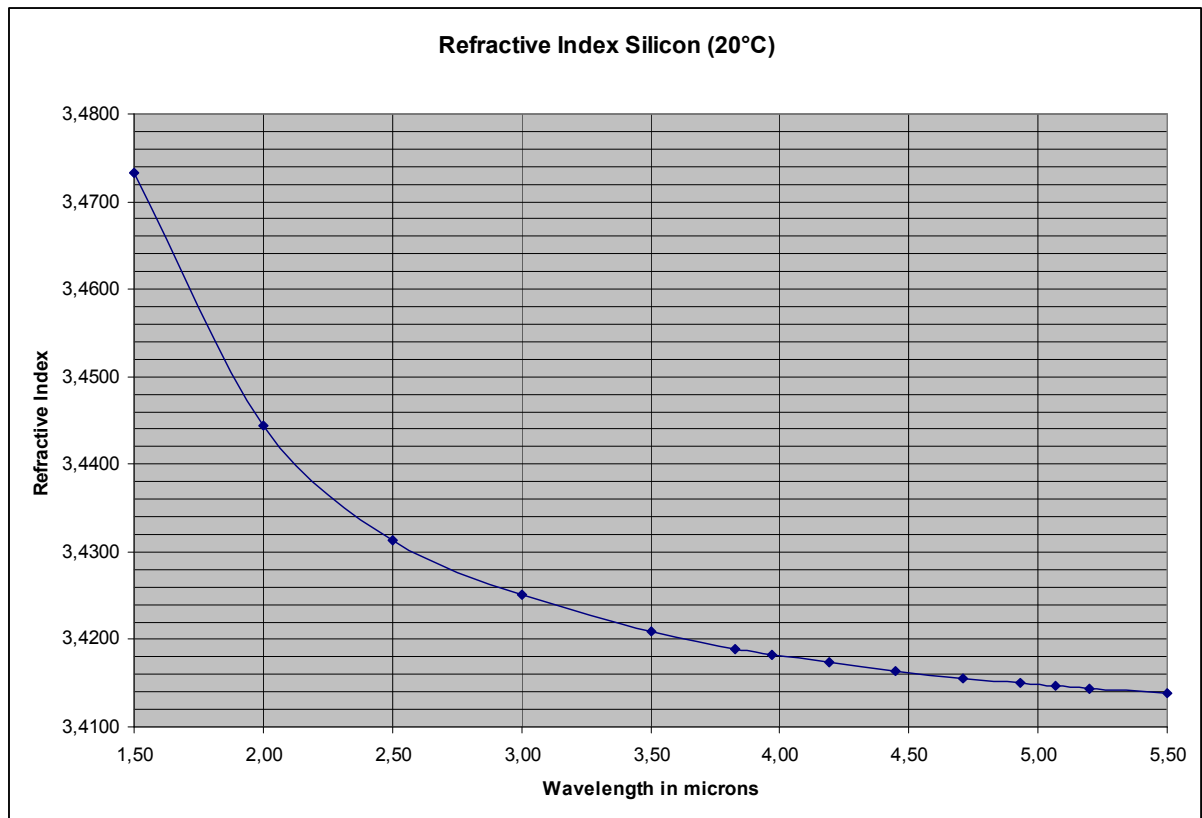
Silicon

Physical Properties^[1]

- | | |
|---------------------------------|---------------------------|
| • Melting Point | 1414°C |
| • Density | 2.329 g/cm ³ |
| • Thermal Expansion Coefficient | 2.6 x 10 ⁻⁶ /K |
| • Youngs Modulus <111> | 187 GPa |

Optical Properties^[2]

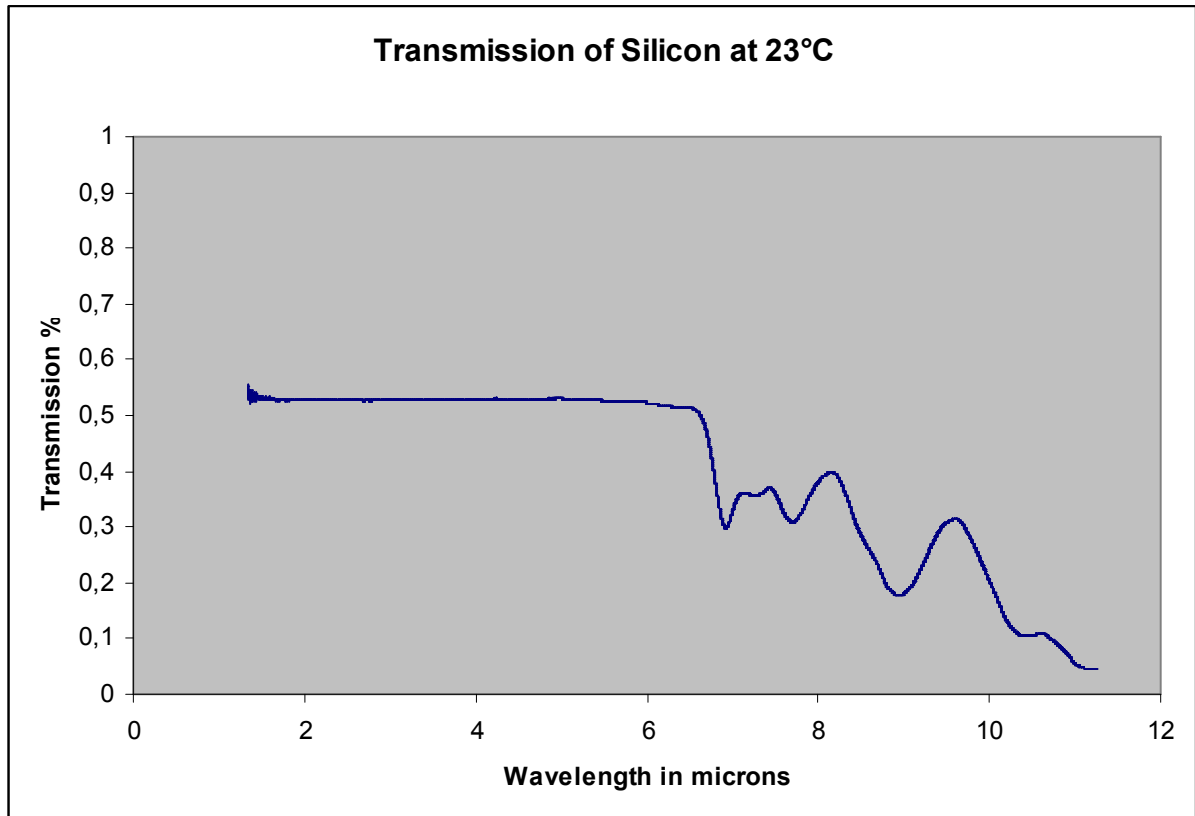
- Refractive Index



- Dn/dT 1.56 x 10⁻⁴/°K @ 5.2μ

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- Transmission



Material Specifications

- Purity > 99.999%
 - Crystal Structure Monocrystalline
 - Type/Dopant N/Phosphorous; P/Boron
 - Orientation <111>; <100>
 - Resistivity 5.0 - 40 Ω/cm
 - Standard Optical Grade > 10 Ω/cm
 - Mirror Grade 1.0 - 10 Ω/cm
 - EXT Grade > 50 Ω/cm
- EXT Grade has specific enhanced properties in transmission.

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Products

- Rods and Discs 10 - 300 mm
- Domes 50 - 250 mm
- Plano Optics 10 - 300 mm; 200 x 200 mm
- Lenses 10 - 300 mm
- Rectangular and Other Shapes 200 x 200 mm; max. 300 mm diagonal
- Witness samples and Wedges 25.4mm Ø; 1 - 10 mm thick

Tolerances

Tolerances are diameter dependent, and they are based on 10mm minimum to 300mm maximum. Fabrication is according to DIN 286-2 (1990-11) and ASME Y14.5M 1994. Tighter tolerances are available upon request.

- Diameter: ± 0.2 mm to ± 1.5 mm
- Thickness: ± 0.1 mm to ± 0.8 mm
- Flatness: $\pm 30'$
- Parallelism: ≤ 25 μm
- Perpendicularity: ≤ 30 μm
- Chamfer: 0.1 mm to 1.6 mm
- ETV: ≤ 30 μm
- Roundness: ≤ 30 μm
- Length and Width: ± 0.05 mm

Surface Quality

- As cut
 - Standard D46 Rq = 2 μm max.
 - Fine D15 Rq = 0.8 μm max.
 - Superfine D7 Rq = 0.2 μm max.
 - Polished
- S/D: 60/40 or better
Flatness: 5 fringes
Irregularity: 2 fringes
Parallelism: 0.01 mm

Rq is defined as RMS deviation of all peaks/valleys to surface.
Polishing provided for filters and witness samples only.

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Quality Assurance:

- Full traceability according to MIL 130 Standard back to Melt / Lot

[¹] Taken from NIST Database.

[²] Measured by Photonic-Sense.

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