# Mateck Germanium (Ge)

**Category :** Pure Element

**Material Notes:**

Optical crystals

Order this product through the following link:
http://www.lookpolymers.com/polymer_Mateck-Germanium-Ge.php

| Physical Properties | Metric | English | Comments |
|---|---|---|---|
| Density | 5.33 g/cc<br>@Temperature 25.0 Â°C | 0.193 lb/inÂ³<br>@Temperature 77.0 Â°F | |
| Solubility | 0.00 ppm | 0.00 ppm | |
| a Lattice Constant | 5.657 Ã… | 5.657 Ã… | |
| Molecular Weight | 72.61 g/mol | 72.61 g/mol | |

| Mechanical Properties | Metric | English | Comments |
|---|---|---|---|
| Vickers Microhardness | 9000 | 9000 | MPa |
| Hardness, Mohs | 6.0 | 6.0 | |
| Modulus of Elasticity | 103.2 GPa | 14970 ksi | in <100> direction |
| | 155.6 GPa | 22570 ksi | in <111> direction |
| Poissons Ratio | 0.278 | 0.278 | |
| Shear Modulus | 46.7 GPa | 6770 ksi | in <111> direction |
| | 67.2 GPa | 9750 ksi | in <100> direction |

| Thermal Properties | Metric | English | Comments |
|---|---|---|---|
| CTE, linear | 5.10 - 5.80 Âµm/m-Â°C<br>@Temperature -60.0 - 60.0 Â°C | 2.83 - 3.22 Âµin/in-Â°F<br>@Temperature -76.0 - 140 Â°F | |
| Specific Heat Capacity | 0.310 J/g-Â°C | 0.0741 BTU/lb-Â°F | |
| Thermal Conductivity | 59.8 W/m-K<br>@Temperature 27.0 Â°C | 415 BTU-in/hr-ftÂ²-Â°F<br>@Temperature 80.6 Â°F | |
| Melting Point | 937 Â°C | 1720 Â°F | |

| Optical Properties | Metric | English | Comments |
|---|---|---|---|
| Refractive Index | 4.0034 | 4.0034 | n10.6 |
| | 4.0017<br>@Wavelength 15000 nm | 4.0017<br>@Wavelength 15000 nm | |
| | 4.004<br>@Wavelength 10000 nm | 4.004<br>@Wavelength 10000 nm | |
| | 4.0076<br>@Wavelength 7000 nm | 4.0076<br>@Wavelength 7000 nm | |
| | 4.1079<br>@Wavelength 2000 nm | 4.1079<br>@Wavelength 2000 nm | |
| IR Transmittance | 56 %<br>@Wavelength 15000 nm | 56 %<br>@Wavelength 15000 nm | Internal Transmittance |
| | 70 %<br>@Wavelength 12000 nm | 70 %<br>@Wavelength 12000 nm | Internal Transmittance |
| | 97 %<br>@Wavelength 3000 nm | 97 %<br>@Wavelength 3000 nm | Internal Transmittance |
| | 97 %<br>@Wavelength 9000 nm | 97 %<br>@Wavelength 9000 nm | Internal Transmittance |

| Descriptive Properties | Value | Comments |
|---|---|---|
| Cleavability | (111) | perfect |
| Constants of Elastic Compliance (Pa^-1) | 1.489E-11 | |
| | -2.65E-12 | |
| | 9.69E-12 | |
| Symmetry Class | m3m | |
| Syngony | cubic | |
| Thermal Coefficient of Refractive Index | 3.5E-4 to 4E-4 | 3.39 microns for Â± 60Â°C |
| Transmission Range (microns) | 2 - 17 | |

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