

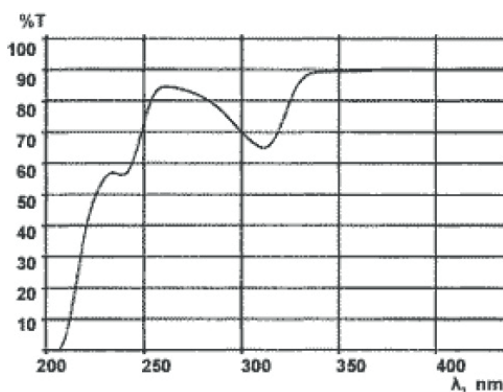
Optical material / crystals (Infrared)

Material / Specification: Calcite for 0.3µm to 2.3µm transmission

Range / Description: OPMI-CALCITE

Calcite, is used for polarisers and retardation plates. Double refraction occurs when a ray of light enters calcite crystals and due to calcite's unique optical properties, the ray is split into fast and slow beams. As these two beams exit the crystal they are bent into two different angles (known as *angles of refraction*).

Internal Transmittance



| Refractive Index n vs. Wavelength λ | | | | | | | | | | | | | | | | |
|-------------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|-----|-----|-----|-----|
| µm | 0.20 | 0.30 | 0.40 | 0.50 | 0.64 | 0.71 | 0.80 | 0.91 | 1.04 | 1.50 | 1.91 | 2.10 | --- | --- | --- | --- |
| no | 1.90 | 1.71 | 1.68 | 1.66 | 1.65 | 1.65 | 1.64 | 1.64 | 1.64 | 1.63 | 1.62 | 1.62 | --- | --- | --- | --- |
| ne | 1.57 | 1.51 | 1.49 | 1.48 | 1.48 | 1.48 | 1.48 | 1.48 | 1.47 | 1.47 | 1.47 | 1.47 | --- | --- | --- | --- |

| Optical Properties | |
|-------------------------|--------------------------|
| Transmission Range | 0.3 to 2.3 micron |
| Refractive Index | No 1.6654 at 0.51 micron |
| Refractive Loss | 11.7% at 0.51 micron |
| Crystal/Class Structure | Trigonal (hex) |
| Cleavage Plane | (1011) cleavage |

| Mechanical Properties | |
|-----------------------|-------------------------------|
| Density | 2.71 g/cc |
| Hardness (Knoop) | 155 Moh 3 |
| Youngs Modulus | 72.35 (perp) 88.19 (para) GPa |
| Shear Modulus | 35 GPa |
| Bulk Modulus | 129.53 GPa |
| Poisson Ratio | 4.83 MPa (700 psi) |
| Elastic Limit | 4.83 MPa (700 psi) |
| Molecular Weight | 100.09 |

| Thermal Properties | |
|------------------------|---|
| Thermal Expansion | 58 x 10 ⁻⁶ /°C |
| Thermal Conductivity | 0.544 W m ⁻¹ K ⁻¹ at 293K |
| Melting Point | 414.5°C |
| Specific Heat Capacity | 201 J Kg ⁻¹ K ⁻¹ |

| Chemical Properties | |
|---------------------|----------------------------|
| Solubility | 0.0014g/100g water at 25°C |