

MgF₂ – Magnesium Fluoride

CRYSTALLOGRAPHIC

Syngony	Tetragonal
Symmetry Class	4/mmm
Lattice Constants	a = 4.64 Å c = 3.06
Cleavability	(100),(110) perfect

OPTICAL

Refractive Index at n_e	1.3786
Refractive Index at n_{F'} - n_{C'}	1.3904
Refractive Index at n_{10.6}	0.0034
Refractive Index at n_{8.0} - n_{12.5}	0.0110
Thermal Coefficient of Refractive Index at 3.39 microns for Δ60 °C	Δ _o = (0.15 ... 0.10) x 10 ⁻⁵ Δ _e = (0.15 ... 0.10) x 10 ⁻⁵
Transmission Range, microns	0.13 - 7.0

THERMAL

Thermal Linear Expansion, °C⁻¹ for Δ60 °C	
ΔΔ to c-axis	(6.23 ... 9.25) x 10 ⁻⁶
to c-axis	(10.86 ... 14.54) x 10 ⁻⁶
Specific Heat Capacity, J/(kg * °C)	0.9200 x 10 ³
Melting Point, °C	1255

MECHANICAL

Density, g/cm³ at 20 °C	3.18
Mohs Hardness	6
Vickers Microhardness, Pa	
ΔΔ to c-axis	441 x 10 ⁷
to c-axis	289 x 10 ⁷
Constants of Elastic Compliance, Pa⁻¹	S ₁₁ = 12.45 x 10 ⁻¹² S ₁₂ = -7.16 x 10 ⁻¹² S ₁₃ = -1.66 x 10 ⁻¹² S ₃₃ = 5.94 x 10 ⁻¹²



$$S_{44} = 17.54 \times 10^{-12}$$

$$S_{66} = 10.53 \times 10^{-12}$$

Young Modulus (E), Pa

⊗⊗ to c-axis 16.91 x 1010

|| to c-axis 7.97 x 1010

Shear Modulus (G), Pa

⊗⊗ to c-axis 5.71 x 1010

|| to c-axis 9.52 x 1010

Poisson Ratio

|| to c-axis 0.577

CHEMICAL

Molecular Weight 62.32

Solubility

in water, gram/100 cm³ 0.0076

in acids soluble

REF. INDEX VS. WAVELENGTH λ

Wavelength, Microns	Refractive Index no	Refractive Index ne
0.2	1.4231	1.4367
0.5	1.3797	1.3916
1.0	1.3736	1.3852
2.0	1.3686	1.3797
3.0	1.3618	1.3724
4.0	1.3525	1.3622
5.0	1.3400	1.3487
6.0	1.3242	1.3315
7.0	1.3044	1.3101
0.2	1.4231	1.4367
0.5	1.3797	1.3916
1.0	1.3736	1.3852
2.0	1.3686	1.3797
3.0	1.3618	1.3724
4.0	1.3525	1.3622
5.0	1.3400	1.3487



INTERNAL TRANSMITTANCE $\zeta_i(\lambda)$ VS. WAVELENGTH λ

Wavelength, Microns	Internal Transmittance
0.2	0.95
0.5	0.97
1.0	0.97
3.0	0.97
5.0	0.97
6.0	0.91
7.0	0.54
8.0	0.12

Custom sizes and specifications are available on request.

