

Magnesium Fluoride (MgF₂)

Custom sizes and specifications are available

CRYSTALLOGRAPHIC

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

OPTICAL

Refractive Index at n_e for "o"-ray	1.3786
Refractive Index n_e for "e"-ray	1.3904
Refractive Index at n_{F-C} for "o"-ray	0.0034
Refractive Index n_{F-C} for "e"-ray	0.0110
Thermal Coefficient of Refractive Index at 3.39 microns for +/-60 deg C	$\beta_o = (0.15...0.10) \times 10^{-5}$ $\beta_e = (0.10...0.04) \times 10^{-5}$
Transmission Range, microns	0.13-7.0

THERMAL

Thermal Linear Expansion, deg C ⁻¹ for +/-60 deg C	
⊥ to c-axis	$(6.23...9.25) \times 10^{-6}$
∥ to c-axis	$(10.86..14.54) \times 10^{-6}$
Specific Heat Capacity, J/(kg•deg C)	0.9200×10^3
Melting Point, deg C	1255

MECHANICAL

Density, g/cm ³ at 20 deg C	3.18
Mohs Hardness	6
Vickers Microhardness, Pa	
⊥ to c-axis	441×10^7
∥ to c-axis	289×10^7
Constants of Elastic Compliance, Pa ⁻¹	$S_{11} = 12.45 \times 10^{-12}$ $S_{12} = -7.16 \times 10^{-12}$ $S_{13} = -1.66 \times 10^{-12}$ $S_{33} = 5.94 \times 10^{-12}$ $S_{44} = 17.54 \times 10^{-12}$ $S_{66} = 10.53 \times 10^{-12}$

Young Modulus (E), Pa	
⊥ to c-axis	16.91×10^{10}
∥ to c-axis	7.97×10^{10}
Shear Modulus (G), Pa	
⊥ to c-axis	5.71×10^{10}
∥ to c-axis	9.52×10^{10}
Poisson Ratio	
∥ to c-axis	0.577

CHEMICAL

Molecular Weight	62.32
Solubility	
in water, gram/100 cm ³	0.0076
in acids	soluble

Refr. Index n vs. Wavelength λ

WAVELENGTH, MICRONS	REFRACTIVE INDEX n_o	n_e
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

Internal Transmittance τ_i (λ) 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

