

MAGNESIUM FLUORIDE MgF2

Crystallographic MgF2 (Magnesium Fluoride)

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

Optical MgF2 (Magnesium Fluoride)

Refractive Index at n_e	n_o	1.3786
	n_e	1.3904
Refractive Index, $n_F - n_C$	n_o	0.0034
	n_e	0.0110
Thermal Coefficient of Refractive Index at $\lambda=3.39$ microns, $^{\circ}\text{C}^{-1}$ for $\pm 60^{\circ}\text{C}$	b_o	$(0.15, 0.10) \cdot 10^{-5}$
	b_e	$(0.10, 0.04) \cdot 10^{-5}$
Transmission Range, microns (thickness 10mm)	0.13 , 7.0	
Transmittance $t_i(\lambda)$ vs. wavelength λ MgF2		

Internal Transmittance $t_i(\lambda)$ vs. wavelength λ MgF2 Magnesium Fluoride	
λ, MKM	$t_i(\lambda)$
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

Refractive Index n vs. wavelength λ	
λ, MKM	n_o/n_e
0.2	1.4231 1.4376
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

Thermal MgF2 (Magnesium Fluoride)

Thermal Linear Expansion $\alpha_t, ^{\circ}\text{C}^{-1}$ for $\pm 60^{\circ}\text{C}$	\wedge to c-axis	$(6.23, 9.25) \cdot 10^{-6}$
	// to c-axis	$(10.86, 14.54) \cdot 10^{-6}$
Specific Heat Capacity, $\text{J}/(\text{kg} \cdot ^{\circ}\text{C})$ at 18°C	920.0	
Melting Point, $^{\circ}\text{C}$	1255	

Mechanical MgF2 (Magnesium Fluoride)

Density, g/cm^3 at 20°C	3.18	
Mohs Hardness	6	
Vickers Microhardness , Pa	\wedge to c-axis	$289 \cdot 10^7$
	// to c-axis	$441 \cdot 10^7$
Constants of Elastic Compliance, Pa^{-1}	S_{11}	$12.45 \cdot 10^{-12}$
	S_{12}	$-7.16 \cdot 10^{-12}$
	S_{13}	$-1.66 \cdot 10^{-12}$
	S_{33}	$5.94 \cdot 10^{-12}$
	S_{44}	$17.54 \cdot 10^{-12}$
	S_{66}	$10.53 \cdot 10^{-12}$
Poisson Ratio	// to c-axis	0.577
Young Modulus (E), Pa	// to c-axis	$16.91 \cdot 10^{10}$
	\wedge to c-axis	$7.97 \cdot 10^{10}$
Shear Modulus (G), Pa	// to c-axis	$5.71 \cdot 10^{10}$
	\wedge to c-axis	$9.52 \cdot 10^{10}$

Chemical MgF2 (Magnesium Fluoride)

Solubility	
in water at 18°C , $\text{g}/100\text{cm}^3$	in acids
0.0076	soluble

"Opto-Technological Laboratory" produces lenses, windows, prisms, wedges, cylindrical lenses and others optical components according to customers' specifications and drawings out of crystals magnesium fluoride (MgF2).