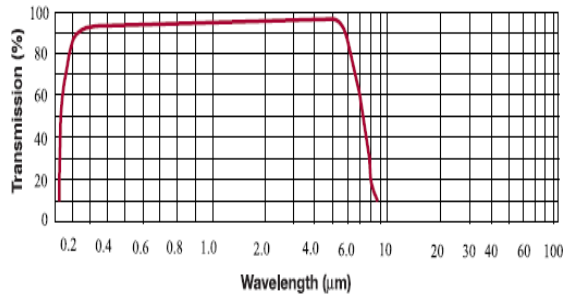


Magnesium Fluoride



Wavelength (μm)	Index of Refraction (n)
0.114	1.7805
0.118	1.6800
0.130	1.5560
0.150	1.4800
0.170	1.4470
0.190	1.4310
0.300	1.4000
0.700	1.3760



# Magnesium Fluoride (MgF<sub>2</sub>)

## Features

Magnesium Fluoride is used for optical elements in both the infrared and ultraviolet. Its useful transmission range is from 0.19μm to 6.5μm. The refractive index varies from about 1.48 to 1.3. Magnesium Fluoride is a bi-refrindex material and this aspect should be taken into consideration before selection of this material in an optical design. PHOTONIK uses only VUV grade material, with the C-axis oriented to minimize birefringence. Irradiation does not lead to color centers. This VUV material is the least susceptible to radiation induced color centers.

Magnesium Fluoride is one of the lowest index infrared materials, second only to Lithium Fluoride. It is resistant to thermal and mechanical shock. The material is twice as hard as Calcium Fluoride but only half as hard as Germanium. Magnesium Fluoride is significantly more expensive than Calcium Fluoride and Barium Fluoride, but usually not more expensive than Lithium Fluoride. Magnesium Fluoride is similar to Calcium Fluoride in its resistance to water.

Parameter	Specifications
Transmission Range	0.121μm ~ 7.0μm
Density	3.177 g/cm <sup>3</sup>
Thermal Expansion	13.7 x 10 <sup>-6</sup> /°C Parallel to C-axis
Co-Efficient	8.48 x 10 <sup>-6</sup> /°C Perpendicular to C-axis
Surface Quality	Polishes of 10-5, or 20-10 scratch-dig are achieved at extra costs respectively mainly for UV applications. Typical specifications for surface quality in the visible & near infrared regions are a 40-20 & 60-40 scratch dig in the 3 to 7μm range. MgF <sub>2</sub> is diamond turnable.
Surface Figure	In the UV & Visible spectral regions, surface figure ranges from 1/10 wave to 1/2 wave @ 632.8nm. In the infrared, typical required surface figure ranges from 1/2 wave to 2 waves @ 632.8nm, specified depending on the system performance requirements.
AR Coating Options	Magnesium Fluoride can be AR coated for use in the infrared but generally without much improvement in transmission due to its low index of refraction & already high transmission.
Typical Applications	Thermal imaging, Astronomical, Excimer laser applications.
Products Manufactured	Lenses, Aspheric lenses, Windows, Optical Beamsplitters, Optical Filters, Wedges, Prisms.