

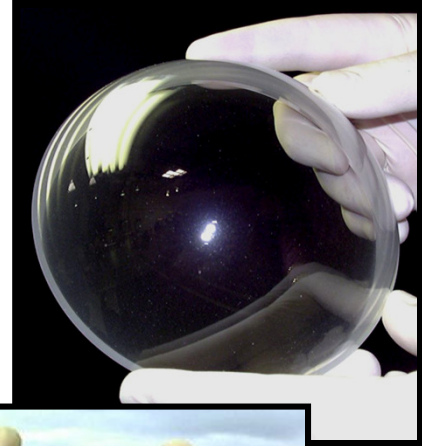


Engineering Better Material Solutions

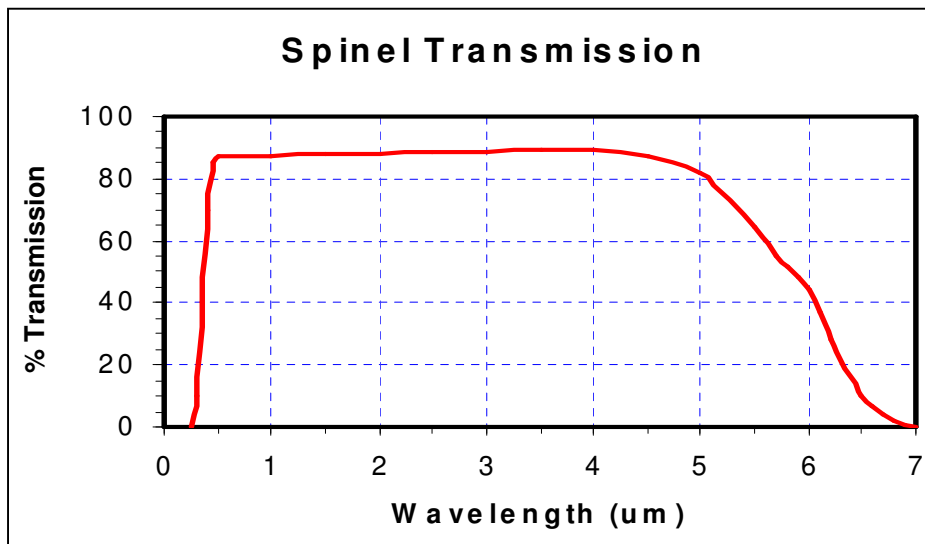
# Spinel Optical Ceramic

## Technical Data

Composition	MgAl <sub>2</sub> O <sub>4</sub>
Form	Polycrystalline
Lattice Constant	8.082 Å
Density* <sup>1</sup>	3.58 g/cc
Melting Point* <sup>1</sup>	2135°C
Grain Size (typical)	Bimodal, 25 um average and 150 um average
Crystal Structure	Cubic, Spinel
Young's Modulus* <sup>1</sup>	276 GPa
Poisson's Ratio* <sup>1</sup>	0.26
Thermal Expansion* <sup>1</sup>	6.97 x 10 <sup>-6</sup> (30-200 C)
Hardness* <sup>1</sup>	1650 kg/mm <sup>2</sup> (Knoop Indentation, 200g load)
Fracture Toughness* <sup>1</sup>	1.5 MPa-m <sup>1/2</sup>
Flexure Strength* <sup>1</sup>	170 MPa
Specific Heat* <sup>1</sup>	0.8191 J/g - °C
Thermal Conductivity* <sup>1</sup>	25 W/m-C @ 25°C
Transmission Limits* <sup>1</sup>	0.25 to 6.5 microns
Typical Transmission (@ 4 mm thickness)	76% @ 0.65 um 83% @ 1.064 um 82% @ 4.5 um
Ref. Index Homogeneity (RMS)	<5 x 10 <sup>-6</sup> over 3.0" diameter <9 x 10 <sup>-6</sup> over 4.7" diameter



\*1- Reference 1: Handbook of Optics Volume II ,McGraw Hill, Inc. (1995)



Index of Refraction	
λ(μm)	n
0.404	1.7359
0.50	1.7230
0.60	1.7155
0.70	1.7108
0.80	1.7075
1.00	1.703
2.40	1.6807
3.00	1.6677
4.00	1.6386
5.00	1.598

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