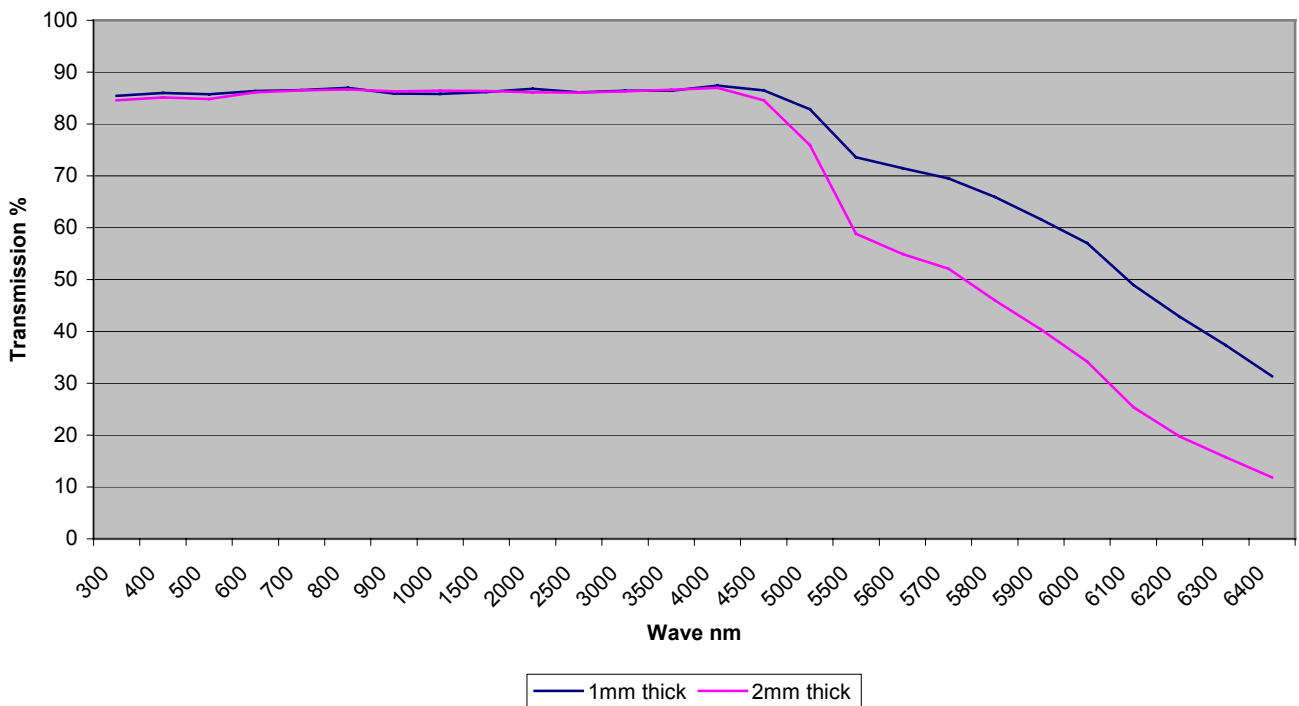




DATA SHEET

SAPPHIRE

Sapphire Windows - Typical Transmission



OPTICAL PROPERTIES

Transmission Range	0.17 to 5.5 microns
Refractive Index (table below)	1.75449 (o) 1.74663 (e) at 1.06 microns
Reflection Loss	14% at 1.06 microns (2 surfaces)
Absorption Coefficient	$0.3 \times 10^{-3} \text{ cm}^{-1}$ at 2.4 μm
Reststrahlen Peak	13.5 μm
dN/dT	13.7×10^{-6} at 5.4 μm
dN/d $\mu = 0$	1.5 μm

PHYSICAL PROPERTIES

Density	3.97 gm/cc
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Melting Point	2040°C
Thermal Conductivity	27.21 Wm ⁻¹ K ⁻¹ at 300K
Thermal Expansion	5.6 (para) & 5.0 (perp) x 10 ⁻⁶ /K *
Hardness	Knoop 2000 with 2000g indenter
Specific Heat Capacity	419 J Kgm ⁻¹ K ⁻¹
Dielectric Constant	11.5 (para) 9.4 (perp) at 1MHz
Youngs Modulus (E)	335 GPa
Shear Modulus (G)	148.1 GPa
Bulk Modulus (K)	240 GPa
Elastic Coefficients	C11=496 C12=164 C13=115 C33=498 C44=148
Apparent Elastic Limit	300 MPa (45,000 psi)
Poisson Ratio	0.25

CHEMICAL PROPERTIES

Solubility	98 x 10 ⁻⁶ g/100g water
Molecular Weight	101.96
Class/Structure	Trigonal (hex), R3c

REFRACTIVE INDEX

µm	No	Ne	µm	No	Ne	µm	No	Ne
0.193	1.92879	1.91743	0.442	1.78038	1.77206	1.064	1.75449	1.74663
0.213	1.88903	1.87839	0.458	1.77843	1.77015	1.320	1.75009	1.74227
0.222	1.8754	1.86504	0.488	1.7753	1.76711	2.703	1.719	1.711
0.226	1.87017	1.85991	0.515	1.77304	1.76486	2.941	1.712	1.704
0.244	1.85059	1.84075	0.532	1.7717	1.76355	3.333	1.701	1.693
0.248	1.84696	1.83719	0.694	1.76341	1.75542	3.704	1.687	1.679
0.257	1.83932	1.82972	0.755	1.76141	1.75346	4.000	1.674	1.666
0.266	1.83304	1.82358	0.780	1.76068	1.75274	4.348	1.658	1.65
0.337	1.80082	1.79206	0.800	1.76013	1.7522	4.762	1.636	1.628
0.351	1.79693	1.78825	0.820	1.75961	1.75168	5.000	1.623	1.615
0.355	1.79598	1.78732	0.980	1.75607	1.74819			

WHILE EVERY ATTEMPT HAS BEEN MADE TO VERIFY THE SOURCE OF THE INFORMATION, NO RESPONSIBILITY IS ACCEPTED FOR ACCURACY OF DATA.

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