



## ALKOR TECHNOLOGIES

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Chemical Formula	$\text{Al}_2\text{O}_3$
Crystal Class	Trigonal
Molecular Weight	101.94
Density, $\text{g/cm}^3$ (20 °C)	3.98
Reflection Loss, % for two surfaces at 4 $\mu\text{m}$	12
Sapphire Dielectric Constant for $10^3$ - $10^9$ Hz at 298 K	11.5
parallel to C-axis	9.3
perpendicular to C-axis	
Dielectric Strength, KV/mm	17
Resistivity at 20°C, Ohm cm	$> 10^{16}$
Melting Temperature, K	2300
Sapphire Thermal Conductivity, W/(m K) at 300 K	35.1
parallel	33.0
perpendicular	
Thermal Expansion, 1/K at 293 K	$5.6 \times 10^{-6}$
parallel	$5.0 \times 10^{-6}$
perpendicular	
Specific Heat, cal/(g K) at 298 K	0.18
Bandgap, eV	9.9
Solubility in water	None
Mohs Hardness	9
Knoop Hardness, $\text{kg/mm}^2$	1370
Young's Modulus, GPa	335
Shear Modulus, GPa	148
Bulk Modulus, GPa at 273 K	240
Apparent Elastic Limit, MPa	275
Poisson's Ratio	0.25

### Sapphire refractive index for ordinary ray

Wavelength, mkm	0.3	0.4	0.7	1.0	2.0	3.0	4.0	5.0
Refractive index	1.814	1.785	1.763	1.757	1.740	1.713	1.677	1.623