



## SAPPHIRE – TECHNICAL DATA

### Physical Properties

Crystal structure	single-crystal	hexagonal
Chemical composition	Al <sub>2</sub> O <sub>3</sub>	
Purity	99,99%	
Density	3,98 g/cm <sup>3</sup>	

### Thermal Properties

Melting point	2050°C	
Working temperature	1800°C	
Specific heat	750 J/kg K	@ 25°C
Thermal conductivity	40 W/(m K)	@ 25°C
Thermal expansion	5,0 × 10 <sup>-6</sup> K	@ 25°C perpendicular to C-axis
	6,6 × 10 <sup>-6</sup> K	@ 25°C parallel to C-axis

### Mechanical Properties

Modulus of elasticity	360 - 440 GPa	@ 25°C
Flexural strength	450 - 900 MPa	@ 25°C
Compressive strength	2000 MPa	@ 25°C
Hardness	1800 Knoop	surface parallel to C-axis
	2200 Knoop	surface perpendicular to C-axis
Mohs scale of hardness	9 Mohs	

### Chemical Resistance

Resistant against acidic and alkaline solutions	up to 300°C
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### Electrical Properties

Dielectric constant	9,4 – 11,4	@ 25°C
Specific resistivity	10 <sup>16</sup> Ohm cm	@ 25°C
	10 <sup>11</sup> Ohm cm	@ 500°C
	10 <sup>6</sup> Ohm cm	@ 1000°C
	10 <sup>3</sup> Ohm cm	@ 2000°C
Dielectric strength	48 kV	@ 50 Hz

### Optical Properties

Index of refraction	1,768	n <sub>o</sub> (@ 590 nm) parallel to C-axis
	1,760	n <sub>e</sub> (@ 590 nm) perpendicular to C-axis

Transmission

