

SAPPHIRE Verneuil corindon

ROHS & REACH COMPLIANT

Physical properties

CRYSTALLINE STRUCTURE	rhombohedral hexagonal single
COMPOSITION	Al ₂ O ₃
PURITY	99,99 %
MAIN IMPURITIES	Na ₂ O, Si, Ca, Fe, Ga, Mg, Ti, Mn, Pb, Cu, Zn, Ni
CLEAVAGE	conchoidal
DENSITY	3.99 – 3.98 g/cm ³
DISLOCATION DENSITY	10 ⁹ – 10 ⁸ /m ²

Thermal properties

MELTING POINT	2320 K
SOFTENING POINT	2070 K
SPECIFIC HEAT	7.5 · 10 ² j/kg · K at 300 K
THERMAL CONDUCTIVITY	40 W/m · K ± at 300 K
THERMAL EXPANSION	6.2 · 10 ⁻⁶ /K // C-axis 5.4 · 10 ⁻⁶ /K ± C-axis

Mechanical properties

HARDNESS	Mohs 9 Knoop 2200 face // 1800 face ± C-axis
YOUNG'S MODULUS	4.4 · 10 ¹¹ Pa at 300 K
MODULUS OF RUPTURE	4.0 · 10 ⁸ Pa at 300 K
COMPRESSIVE STRENGTH	2.1 · 10 ⁹ Pa at 300 K
TENSILE STRENGTH	1.9 · 10 ⁸ Pa at 300 K
POISSON'S CONSTANT	0.30

Chemical properties

ACIDS AND ALKALIS ATTACK	0 at 570 K
POROSITY	0

Electrical properties

DIELECTRIC CONSTANT	10.6 electric field // C-axis at 300 K
ELECTRICAL RESISTIVITY	8.6 electric field \perp C-axis at 300
	$10^9 \Omega \cdot m$ at 770 K
	$10^4 \Omega \cdot m$ at 1270 K
	$10 \Omega \cdot m$ at 2270 K

Optical properties

REFRACTIVE INDEX ND AT 0.5893 μm	1.760 face // C-axis 1.769 face \perp C-axis
DISPERSIVE POWER ($N_F - N_C$)	0.011 $\lambda_F = 0.4861 \mu m$ $\lambda_C = 0.6563 \mu m$
TRANSMISSION, DISC THICKNESS 1 MM :	
- VISIBLE LIGHT	excellent
- INFRARED	85% 0.75 – 5 μm 70% 5.5 μm
- ULTRAVIOLET	50% 6 μm 80% 0.4 – 0.3 μm 60% 0.28 μm 50% 0.2 μm

Transmission

