



SILICON NITRIDE COMPONENTS & FIXTURES for
ALUMINUM FOUNDRY & CASTING

Comparison list of properties between silicon nitride ceramic and other materials

Material		Si ₃ N ₄	Al ₂ O ₃	SiC	Al ₂ TiO ₅	Cast Iron	Bearing Steel
Item							
Density	g/cm ³	3.15-3.3	3.0-3.95	2.8-3.2	3.2-3.4	7.2-7.8	7.85-12
Hardness	HRC	75-80	70-80	85-90	55-70	50-60	60-66
Fracture Toughness	MPa.m ^½	7	4.2	3.9	3.5	15-20	25
Young's modulus	GPa	300	340	208	200	100	200
Compressive strength	MPa	2500	2200	1800	1600	800	1200
Bending Strength	MPa	600-900	150-300	500-800	35-60	200	280
Coefficient of linear expansion	X10 ⁻⁶ /°C	3.2	8.5	3	0-1.6	16	12.5
Thermal Conductivity	W/m.k	20-50	26	120	1-2	55	40
Max Operation Temperature	°C	1300	1600	1400	1450	200	150
Rolling fatigue failure		Flaking	Broken	Broken	Broken	Flaking	Flaking