

optoSiC-plus® - Material-Features



Density [ρ]	> 3.16	g/cm ³	[DIN EN 623-2]	rev-12
Vickers Hardness	25.5	HV 1 (GPa)	[DIN EN 843-4]	
Knoop Hardness	24.5	HK 0.1 (GPa)	[DIN EN 843-4]	
Flexual Strength [σ_B]	510	MPa	[DIN EN 843-1]	
Young's Modulus [E]	420	GPa	[DIN EN 843-2]	
Weibull Modulus [m]	15		[DIN EN 843-5]	
Poisson's Ratio [ν]	0.17			
Fracture Toughness [SENB]	4	KIC [MPa*m ^{0.5}]		
Microporosity [ρ]	< 1.0	$\mu\text{m Typ } 0.4 \%$	[DIN EN 623-2]	
Open Porosity	0%			
Mean Grain Size	< 2.5	$\mu\text{m Typ } 1,5\mu\text{m}$		
CTE [α] TEC	4.1	[10 ⁻⁶ /°K] 20-500°C	[DIN EN 821-1]	
Coefficient Thermal Expansion	2.5	[10 ⁻⁶ /°K] 15-25°C		
Thermal Stress [R_i]	246 37	R_1 [K] R_2 [W/mm]	$R_1 = \sigma_B \cdot (1-\nu) / (\alpha \cdot E)$ $R_2 = R_1 \cdot \lambda$	
Specific Electrical Resistance [ρ]	10 ⁶ - 10 ⁸	$\Omega \cdot \text{cm}$	[DIN EN 50359]	
Heat Capacity [c_p]	20°C 1000°C	0.67 1.27	J/g * K	Specific heat c_p (dynamic DSC, DIN EN 821-3)
Heat Conductivity [λ] Thermal Conductivity [TC]	20°C 1000°C	150 54	W/m K kJ/m * h * K	Calculation of thermal conductivity TC based on thermal diffusivity a (Laser-Flash, DIN EN 821-2), specific heat c_p (dynamic DSC, DIN EN 821-3), and density (corrected for the termal expansion TEC, DIN EN 821-1)