

# optoSiC-plus<sup>®</sup> - Material-Features – special hipped



Density [ $\rho$ ]	> 3.16	g/cm <sup>3</sup>	[ DIN EN 623-2 ] (3,18 in sim)	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 [ $\sigma_B$ ]	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 [ $\nu$ ]	0.17			
Fracture Toughness [SENB]	4	KIC [MPa*m0.5]		
Microporosity [p]	< 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 [ $\alpha$ ]    TEC	4.1	[10 <sup>-6</sup> /°K] 20-500°C	[ DIN EN 821-1 ]	
Coefficient Thermal Expansion	2.5	[10 <sup>-6</sup> /°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 [ $\rho$ ]	10 <sup>6</sup> - 10 <sup>8</sup>	$\Omega \cdot \text{cm}$	[ 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 [ $\lambda$ ] 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 thermal expansion TEC, DIN EN 821-1)