Technical Datasheet 100

optoSiC+

ultra-high performance optical grade Silicon Carbide

optoSiC GmbH have developed the *optoSiC*+ ultra-high performance optical grade of Silicon Carbide for use in applications where very high central rotational torque loadings will commonly affect the dynamic flatness of a high speed mirror.

By ultra-high pressure primary compaction, and then secondary, fast in-sintering compaction, the homogeneity of *optoSiC*+ enhances flexural stiffness and therefore dynamic flatness, at far higher resonant frequencies under high torque loadings, and can be engineered to produce ultra-low Moment of Inertia for applications where processing speed and optical performance is paramount.

optoSiC+ can be produced up to a maximum 600 x 300 x 50mm, or ø300mm piece size by CNC milling, or up to ø80mm by die-stamping or up to 50mm^2 by injection moulding, and then polished to 1/8λ PV* to give a consistent optical surface quality of <Ra. 0.4nm.

Due to the nature of production, *optoSiC*+ becomes cost-effective with higher production volumes, but is not recommended for production quantities of less than 10 pieces.

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optoSiC+ Material Specifications:

Density	>3.16g/cm^3
Vickers Hardness	25.5 HV 1 (GPa) [DIN EN 843-4]
Knoop Hardness	24.5 HK 0.1 (GPa) [DIN EN 843-4]
Flexural Strength	510 MPa [DIN EN 843-1]
Compressive Strength	2200 MPa
Young's Modulus [E]	420 GPa [DIN EN 843-2]
Weibull Modulus	15 m [DIN EN 843-5]
Poisson's Ratio	0.17 n
Fracture Toughness [SENB]	4 K_{Ic} [MPa·m$^{0.5}$]
Surface Roughness	Ra. ≥0.3262nm (post-polished, pre-coated)
Polished Flatness	to 1/8λ PV @632.8nm
CTE	4.1 α [10^{-6}/°K] 20-500°C [DIN EN 821-1]
	2.5 α [10^{-6}/°K] 15-25°C [DIN EN 821-1]
Specific Heat	125 λ (W/m K) 20°C [DIN EN 821-3]
Thermal Stress	246 R1[K] (R1 = σ_B·(1-ν)/(α·E)
	31 R2[W/mm] ($R_2 = R_1$·λ)
Specific Electrical Resistance	$10^6 - 10^8$ ρ (Ω cm) [DIN EN 50359]

**Over 90% of the reflective surface from the centre point*