

Why optoSiC-plus[®] in optical systems?

Material Comparison Scanning Systems		CVD / single crystal	Be 98,5%	single crystal	Aluminium	stainless steel metal	LiAlSi Glaskeram	Standard Glas	fused silica	Si-C Ceramic
FOM (figure of merit)		Diamant	Beryllium	Silizium	Aluminium	INVAR	Zerodur	BK7	Lithosil	optoSiC+
Material Typ			S-200FH		AlZnMg-6061-T6 Cu0,5	32-45Ni	DK0	N-BK7	FS	sintered
bulk Density / Dichte / ROH	g/cm³	3,52	1,85	2,33	2,78	8,00	2,53	2,51	2,20	3,17
Total Porosität / Pt	%									< 0,4%
Pop / Porosität / Open porosity	%						dense		dense	0
Mean grain size	µm									< 5
E- elastic Modulus Youngs- GPa = 1000N/mm²		1141	295	148	70	148	90,3	82	72	420
K _{IC} Fract. Toughness	[MPa·m ^{1/2}]		12	1,5	20		0,9	1,3	1,2	4
sigma b/ Flexural strength 3pt-bend	MPa	750	261	65	270	455	490		90	510
mean specific heat Cp (20 °C) kJ/(kg·K) = J/(g·K)		0,52	1,95	0,685	0,86	0,5	0,8	0,86	0,79	0,6
Thermal conductivity / k	W/m·K	2000	216	150	120	13	1,46	1,11	1,31	150
Alpha / CTE 2 (25-100°C)	ppm/K	1	11,4	2,6	27	0,5	0,01	7	0,5	2,5
FOM (optoSiC)										
k * E / (alpha * roh * Cp)	rel units	1.248.495	1.549	5.350	130	962	6.514	6	109	13.249
specific stiffness	E / ROH	324,6	159,5	63,5	25,2	18,5	35,7	32,7	32,7	132,5
	k / alpha	2000,0	18,9	57,7	4,4	26,0	146,0	0,2	2,6	60,0