

ceratec®

TECHNICAL CERAMICS BV

Ceramics		Al ₂ O ₃ 92	Al ₂ O ₃ 99,7	Al ₂ O ₃ 99,8	Sapphire/ Ruby	B ₄ C	AlN	BN	SiC	Si ₃ N ₄	ZrO ₂ TZP	ZrO ₂ PSZ
Material Properties												
Main Content		aluminium oxide				boron carbide	aluminium nitride	boron nitride	α-silicon carbide	silicon nitride	zirconium oxide	
Amount	%	92	99,7	99,8	99,99/ doped Cr ₂ O ₃			>98,5	>98,5		95 +Y ₂ O ₃	97 +MgO
Colour	-	white	white	white	transparent/ red	black	grey/ translucent	white	black	grey	white	white
Density	g/cm ³	3,64	3,85	3,95	3,99	2,51	3,30	2,05	3,1	3,26	6,05	5,74
Porosity	Vol %	<0,2	<0,2	0	0	<0,1		<5	0	<0,1	0	0
Average Grain Size	μ	5-10	30-50	20	mono crystal			0,5-1			0,4	20
Mechanical Properties												
Vickers Hardness	HV 0.5	1560		2100	2300	3800	1100		2800	1450	1200	1120
Mohs' Hardness	-	9	9	9	9	>9,7		1-2	9,7	8	8	8
Modulus of Elasticity	GPa	300	370	380	430	450		30/25	410	275	200	205
Flexural Strength	4pt. MPa	240	300	350	390	400	300	70/30	410	750	1000	820
Compressive Strength	MPa	>3000	2500	3500	2100	2800			2200	>2500	2000	1990
Fracture Toughness	MPa√m	4,9		4	1	3			3,2	7	10	12
Weibull Modulus	-	15		>10		10			10	15	15	>30
Poisson's Ratio	-	0,24				0,15		0,13	0,17	0,25		0,31
Ceramics												
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Thermal Properties												
	Inert, C	1400	1700	1950	1800	2000	1800	2600	2000	1300	1000	900
Thermal Expansion 20-100°C	10 ⁻⁶ /K	6,5		5,3				2/7,5				
20-300°C	10 ⁻⁶ /K	7,0			7,0		4,4		4	2,5	10	10,2
20-600°C	10 ⁻⁶ /K	7,2			7,8	4,5					10	10,2
20-1.000°C	10 ⁻⁶ /K	7,5	8,5		8,0							
500-1.000°C	10 ⁻⁶ /K								5,8	3,6		
1.000-1.500°C	10 ⁻⁶ /K								6,0			
Specific Heat	J/g.K	0,960	0,9	0,755		1			0,6	0,7		
Thermal Conductivity 20°C	W/m.K	21	30	36	26	40	180	65/45	110	35	2,5	3
1.000°C	W/m.K								45			
Electrical Properties												
Electrical Resistivity 20°C	Ω.cm	>10 ¹¹	>10 ¹⁴	10 ¹⁶	10 ¹¹	0,1-2	10 ¹²	10 ¹²	10-100	10 ¹¹		>10 ¹¹
200°C	Ω.cm	>10 ¹¹										
500°C	Ω.cm		10 ¹¹									33
600°C	Ω.cm	>10 ⁹										5
900°C	Ω.cm		10 ⁷									0,1
Dielectric Strength	kV/mm	>20	22		17		15					

*values measured perpendicular/parallel to pressing direction

All data measured at room temperature unless specified. All data obtained from a series of standard test pieces. Actual properties of components may vary from those stated due to the physical nature of ceramic materials.



CERAMIC ON THE RIGHT SPOT!



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