

CHARACTERISTICS of CAPA Fine Ceramics

PROPERTIES*			CAPA-Mg-ZrO		CAPA-SSiC		CAPA-RSiC		CAPA-SiN		CAPA-SiN		CAPA-SiN		CAPA-SiN		CAPA-SiN		CAPA-SiN	
			CAPA-Y-ZrO		CAPA-Mg-ZrO		CAPA-SSiC		CAPA-RSiC		CAPA-SiN		CAPA-SiN		CAPA-SiN		CAPA-SiN		CAPA-SiN	
MATERIAL			YTRIA-STABILIZED ZIRCONIA		MAGNESIUM-STABILIZED ZIRCONIA		SINTERED SILICON CARBIDE		REACTION BONDED SILICON CARBIDE		SILICON NITRIDE		ALUMINIUM NITRIDE		STEATITE		CORDIERITE		CORDIERITE	
UNITS			G/CM ³		G/CM ³		G/CM ³		G/CM ³		G/CM ³		G/CM ³		G/CM ³		G/CM ³		G/CM ³	
Density			6		5.9		3.2		3.2		3.2		3.2		2.8		1.8		1.8	
Water Absorption			0		0		0		0		0		0		0		15%		15%	
Color			WHITE		BEIGE		BLACK		BLACK		BLACK		GRAY		WHITE		BEIGE		BEIGE	
Main Characteristics			▶ Toughness ▶ Mechanical Strength ▶ High Heat Resistance ▶ Corrosion Resistance		▶ Hardness ▶ Variable electrical resistivity ▶ Mechanical strength ▶ Light Weight		▶ High toughness ▶ Thermal shock resistant ▶ Tight tolerances		▶ Thermally stable ▶ Electrical resistivity		▶ Excellent dielectric strength ▶ Low dielectric loss		▶ Excellent thermal shock resistance ▶ Good thermal expansion							
Mechanical Characteristics	Vicker Hardness (Load 500g)		GPa	12.7	12.0	23	22	13.9	10.4	5.8	-									
	Flexural Strength	MOR(20°C)	MPa	1000	545	540	450	580	320	140-160	30									
	Compressive Strength		MPa	5000	2400	-	-	-	-	-	-									
	Young's Modulus of Elasticity		GPa	220	-	440	430	290	310	120	140									
	Poisson Ratio		-	0.31	-	0.17	0.16	0.28	0.24	0.22	0.31									
Thermal Characteristics	Fracture Toughness		Mpa • m ^{1/2}	4-5	6.0	4-5	4-5	4-5	-	-	-									
	Coefficient of Linear Thermal Expansion	40-800°C	1x10 ⁻⁵ /°C	11.0	10.2	3.7-4.4	3.7-4.4	2.4-3.2	4.6	7.7-10.0	<0.2(22-23°C)									
	Thermal Conductivity	20°C	W/(m.K)	3	2.2	140	60	25	140	2.0-3.0	2.0-3.0									
	Specific Heat		J/(g.K)	0.46	-	0.67	0.67	0.64	0.738		0.71									
	Heat Shock Resistance(Put in water)		°C	-	-	-	-	-	-	250	1000									
Electrical Characteristics	Dielectric Strength		kV/mm	11.0	-	-	-	12	25	-	-									
	Volume Resistivity	20°C		10 ¹³	10 ¹⁴	10 ⁵	-	>10 ¹⁴	10 ¹²	-	>10 ¹⁴									
		300°C	Ω.cm	10 ⁶	-	10 ⁴	-	10 ¹²	-	-	10 ¹²									

*The values are typical material properties and may vary according to products configuration and manufacturing process.

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PROPERTIES*			CAPA95		CAPA97		CAPA99		CAPA995		CAPA997		CAPA998	
			UNITS		95%A1203		97%A1203		99%A1203		99.5%A1203		99.7%A1203	
Density			g/cm3		3.7	3.8	3.88	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Water absorption					0	0	0	0	0	0	0	0	0	0
Color					WHITE	WHITE	IVORY	IVORY	IVORY	IVORY	IVORY	IVORY	IVORY	IVORY
Main Characteristics					▶ GENERAL USE ▶ WEAR RESISTANCE ▶ ELECTRICAL INSULATOR ▶ DIELECTRIC STRENGTH ▶ LOW DIELECTRIC LOSS									
Mechanical Characteristics	Vicker Hardness (Load 500g)		GPa	13.0	14.0	15.5	16.0	17.2	17.2					
	Flexural Strength		MPa	320	350	350	370	380	380					
	Compressive Strength		MPa	1960	2200	2250	2300	2350	2350					
	Young's Modulus of Elasticity		GPa	310	320	350	360	360	360					
	Poisson Ratio		-	0.2-0.3	0.2-0.3	0.2-0.3	0.2-0.3	0.2-0.3	0.2-0.3					
	Fracture Toughness		Mpa • m ^{1/2}	3-4	3-4	3-4	4-5	4-5	4-5					
Thermal Characteristics	Coefficient of Linear Thermal Expansion	20-800°C	1x10 ⁻⁶ /°C	7.2	7.2	7.3	7.3	7.3	7.2					
	Thermal Conductivity	20°C	W/(m.K)	22	24	27	28	30	30					
	Using Temperature(Max)		°C	1600	1600	1650	1700	1700	1700					
	Specific Heat		J/(g.K)	0.78	0.78	0.79	0.78	0.79	0.78					
	Heat Shock Resistance(Put in water)		°C	200	200	200	200	200	200					
Electrical Characteristics	Dielectric Strength		kV/mm	15	15	15	15	15	15					
	Volume Resistivity	20°C		>10 ¹⁴	>10 ¹⁴	>10 ¹⁴	>10 ¹⁴	>10 ¹⁴	>10 ¹⁴					
		300°C	Ω.cm	>10 ¹²	>10 ¹²	>10 ¹²	>10 ¹²	>10 ¹²	>10 ¹²					

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