

Ceramco's Production⁴ Formulations and Corresponding Properties

Property	Unit	ZIRCONIA		ALUMINA				
		TZP (Yttria Stabilized)	MSZ (MgO Stabilized)	A998	A96	A9468	A9968	MUL6
Physical Properties								
Composition ¹	weight %	5.4 Y ₂ O ₃	3.5 MgO	99.8	95.9	94	99	72
Density ²	g/cm ³	6.1	5.5	3.89	3.67	2.6	2.9	2.1
Porosity	volume %	Impervious	Impervious	Impervious	Impervious	30%	25%	30%
Crystal Size	micron	<0.5	25-50					
Color		Off-White	Off-White	Ivory	White	White	White	Tan
Mechanical Properties								
Hardness	GPa (Knoop)	13.1 HV	10.0 HV	11.1	11.1	n/a	n/a	n/a
4-point Bend ³ Strength (MOR)	MPa	600		325	320	82	117	62
	(ksi)	100	75	47	46	12	17	9
K1C		9.3	9					
Thermal Properties								
Maximum Service Temperature	°C	800	800	1650	1550	1550	1550	1550
Thermal Expansion Coefficient	°C ⁻¹ (25-700°C)	11.2 x 10 ⁻⁶	9.8 x 10 ⁻⁶	7.5 x 10 ⁻⁶	7.2 x 10 ⁻⁶	7 x 10 ⁻⁶	7 x 10 ⁻⁶	5 x 10 ⁻⁶
Thermal Conductivity (20°C)	W/m·°K	2		35	24	15	24	4
	(Btu·in/ft ² ·hr·°F)	14		242	167	104	166	28
Electrical Properties								
Dielectric Strength	Volts/mil	51		200	210	n/a	n/a	n/a
Dielectric Constant	@1MHz @ 20°C	28		10	9.3	n/a	n/a	n/a
Volume Resistivity	Ohm·cm @ 25°C	>10 ¹³	>10 ⁸	10 ¹⁴	>10 ¹⁴	n/a	n/a	n/a
	Ohm·cm @ 300°C	n/a		2.5x10 ¹¹	1.4x10 ¹⁰	n/a	n/a	n/a
	Ohm·cm @ 1000°C	4.8 x 10 ³	200	5.5x10 ⁸	5.8x10 ⁷	n/a	n/a	n/a

1. Controlled by the Batch Composition
2. Measured by Pycnometer Immersion Technique
3. Per ASTM C 1161-02c
4. Other formulations are available. Please contact us for more information.

Properties not recorded are in testing.

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