

# MATERIAL CHARACTERISTICS

PROPERTY	MATERIAL	Alumina				Zirconia	Silicon Carbide	Low Thermal Conductivity	Electrically Conductive	R&D Material
		AR-99.6	ARW	ARK	AR-4N	AZI	ASiC	Alsim L	Corseed	Black Alumina
ASUZAC Brand	Unit									
Purity (Al <sub>2</sub> O <sub>3</sub> )	%	99.6	99.6	96.0	99.99	—	—	—	—	99.9
Color Tone	-	Ivory	White	White	White	White	Black	Gray	Black Gray	Black
Density	g/cm <sup>3</sup>	3.94	3.90	3.75	3.94	6.00	3.14	2.41	4.24	3.75
Flexural Rigidity	MPa[3points]	370	400	370	330	980	410	146	310	539
Young's Ratio	GPa	390	370	340	360	210	430	115	288	363
Vickers Hardness	GPa	14.7	14.7	14.0	15.7	11.8	28.0	6.5	10.0	10.6
Poisson's Ratio	-	0.24	0.24	0.24	0.23	—	0.17	0.29	0.27	0.23
Fracture Toughness	MPa m <sup>1/2</sup>	4.0	3.0	3.0	4.0	7.0	2~3	1.4	3.0	3.2
Thermal Expansion Coefficient	x10 <sup>-6</sup> [Ambient ~ 800°C]	7.7	7.7	7.7	7.7	10.0	4.1	2.1	8.8	8.1
Thermal Conductivity	W/(m·K)	32.0	28.0	23.0	31.0	4.0	170.0	2.9	5.5	31.2
Specific Heat	J/(kg·K)	0.78×10 <sup>3</sup>	0.78×10 <sup>3</sup>	0.78×10 <sup>3</sup>	0.78×10 <sup>3</sup>	—	0.68×10 <sup>3</sup>	0.75×10 <sup>3</sup>	0.67×10 <sup>3</sup>	0.80×10 <sup>3</sup>
Dielectric Constant	[1MHz]	10.2	9.7	9.5	9.5	—	—	4.8	—	16.7
Dielectric Loss	x10 <sup>-4</sup> [1MHz]	70	5	5	5	—	—	50	—	10
Volume Resistance	Ω·cm	>10 <sup>15</sup>	>10 <sup>15</sup>	>10 <sup>15</sup>	>10 <sup>15</sup>	>10 <sup>12</sup>	x10 <sup>6</sup>	>10 <sup>14</sup>	1	>10 <sup>14</sup>
Withstand Voltage	kV/mm	13.0	14.5	14.5	13.0	—	—	14.5	—	9.3
Reflectivity	% [Wave Length 240 thru 2600 nm, Measuring Plane : Approx. Ra0.8]	—	—	—	—	—	11.1-25.1	—	10.0~26.6	5.1~15.3
Features & Applications	* High Rigidity * High Dielectric Constant * Excellent Wear Resistance				* Excellent Thermal Resistance * High rigidity * Excellent wear resistance		* Low Thermal Expansion	* High Density	* Less Reflection	
					* High Purity * Less Contamination	* High Breakage Tenacity * High Chemical Strength (Fluorine excluded)	* High Dielectric Constant	* Excellent Thermal Resistance * Low Thermal Conduction	* High Dielectric Constant * Reduction Atmosphere at High Temperature	

\* The values listed above are typical numbers and may vary depending on the products.