



**Aluminum Parts:**

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Al<sub>2</sub>O<sub>3</sub>

Material			99%Al <sub>2</sub> O <sub>3</sub>	95%Al <sub>2</sub> O <sub>3</sub>	92%Al <sub>2</sub> O <sub>3</sub>	75%Al <sub>2</sub> O <sub>3</sub>	
Material Characteristics	Density	g/cm <sup>3</sup>	3.9	3.7	3.4-3.7	3.2-3.4	
	Water Absorption	%	< 0.5	< 1	< 2	< 2	
	Sintering Temperature	°C	1,800	1,650	1,620	1520-1600	
Mechanical Characteristics	Vickers Hardness	M <sub>0</sub>	12	10	12	10	
	Flexural Strength	kg/mm <sup>2</sup>	3,000-4,000	3,500	3,000	3,000	
	Compressive Strength	kg/mm <sup>2</sup>	28,000-30,000	25,000-28,000	25,000	20,000	
Thermal Characteristics	Thermal Conductivity	25°C	31.4	21.8	15-20	6-7	
		W/m·k					
	300°C	15.9	12.6				
	Max. Use Temperature	T <sub>(C)</sub>	1,600	1,000	1,600	1,350	
Coefficient of Linear Thermal Expansion	x10 <sup>-6</sup> °C	6.4-8.2	5.5-7.5	7-7.6	7.3		
Melting Temp.	°C	1,750	1,600	1,500	1,300		
Electrical Characteristics	Dielectric Constant	(E)1MHz	9.2-11	9.4-9.8	9.2	8.3-9	
	Dielectric Loss Angle	tg 1MHz	1-1.5	2-3.1	4	5-10	
	Volume Resistivity	20°C	Ω·cm	> 10 <sup>14</sup>	> 10 <sup>10</sup>	> 10 <sup>10</sup>	> 10 <sup>10</sup>
		300°C		> 10 <sup>13</sup>			
500°C		> 10 <sup>12</sup>					
Dielectric Strength	KV/mm	25-30	17.6-20	35	25-30		

## Alumina Sagger

### Sagger for Alumina ( $\text{Al}_2\text{O}_3 > 98\%$ )

Item	OD	Height	Thickness
SCS010010-1.5	10	10	1.5
SCS020025-1.5	20	25	1.5
SCS050050-2.5	50	50	2.5
SCS120120-4.0	120	120	4
SCS150150-4.5	150	150	4.5
SCS200200-5	200	200	5
SCS240240-5.5	240	240	5.5

### Lids for Alumina ( $\text{Al}_2\text{O}_3 > 98\%$ )

Item (P/N)	OD (mm)	Height (mm)	Thickness (mm)
SCL050-5	50	-	5
SCL120-9	120	-	9
SCL150-10	150	-	10
SCL200-10	200	-	10
SCL310-15	310	-	15

### Typical Properties of 98% Alumina Liner

Item	WT%
$\text{Al}_2\text{O}_3$	>98
$\text{Fe}_2\text{O}_3$	0.11
MgO	0.44
$\text{SiO}_2$	0.19
Other	< 0.04

**98% Alumina Properties for Substrate**

<b>Item</b>		<b>&gt; 98% Alumina</b>
<b>Water Absorption</b>	%	0
<b>Bulk Density</b>	g/cm <sup>3</sup>	3.89
<b>Hardness HV 500g</b>	GP	15
<b>Fracture Toughness (K<sub>1c</sub>)</b>	MPa·m <sup>1/2</sup>	5.6
<b>Young's Modulus</b>	GPa	330
<b>Bend Strength (RT)</b>	MPa	550
<b>Thermal Expansion Coefficient</b>	x10 <sup>-6</sup>	6.4
<b>Thermal Conductivity Coefficient (RT)</b>	W/(m·k)	30.4
<b>Max. Use Temperature</b>	°C	1,700-1,750