Material Datasheet

Alumina Tubes & Rods

Material webpage

Overview

Alumina-based tubes & rods aid monitoring the stability and performance of production processes in hostile and aggressive chemical environments at temperatures up to 1700°C. They are usually extruded and are strong, chemically inert, and well proven in a wide field of applications.

Primary Advantages

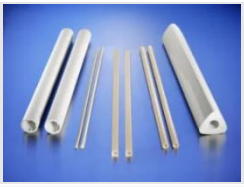
- Mechanically strong
- High Thermal Shock Resistance
- High Temperature Stability
- Low Thermal Expansion

Common Applications

Thermocouple Protection | Furnaces | High Temp Processing | Plasma Applications | University R&D | UHV Applications

Material Range

Precision Ceramics offers a range of Closed One End Tubes with internal diameters ranging from 4mm to 18mm (external diameters ranging from 6mm to 24mm) and in lengths from 530mm to 1,525mm. These are complimented with a range of Open Both End Tubes with internal diameters ranging from 0.2mm to 25mm (external diameters from 0.7mm to 31mm) and in lengths from 174mm to 1,060mm. Additional sizes are available upon request and both ranges are available for quick shipment.

Alumina C799	Mullite C 610
99.7% Al_2O_3	60% Al_2O_3
	
High temperature stability, mechanical strength, and electrical resistivity	**High temperature stability, mechanical strength, and low thermal expansion**
Manufactured in accordance with IEC 60672-1	Manufactured in accordance with IEC 60672-1
Suitable for operating temperatures up to 1700 °C	Suitable for operating temperatures up to 1500 °C
High temperature stability and chemical resistance	High temperature stability and chemical resistance
High mechanical strength	High thermal shock resistance
High electrical resistivity	Low thermal expansion

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	Properties	Unit	Test	Alumina C 799	Mullite C 610
General	Specific Gravity	kg/dm^3	ASTM C 20	3.85	2.8
	Water Absorption	%	ASTM C 373	0	0
	Hardness Rockwell	R 45 N	ASTM E 18	80	-
	Flexural Strength	N/mm^2	ASTM F 417	360	200
Thermal	Thermal Expansion 20 - 100°C	$x10^{-6}/K$	ASTM 372	5.4	4.5
	Thermal Expansion 20 - 300°C	$x10^{-6}/K$	ASTM 372	6.5	5.2
	Thermal Expansion 20 - 600°C	$x10^{-6}/K$	ASTM 372	7.7	5.8
	Thermal Expansion 20 - 1000°C	$x10^{-6}/K$	ASTM 372	8.5	6.7
	Maximum Temperature (Inert)	°C	-	1700	1500
	Thermal Conductivity @ 25°C	W/mK	ASTM F 417	28	4
Electrical	Dielectric Constant	$x10^{-6}/K$	ASTM D 150	10	8
	Dielectric Strength	kV/mm	ASTM D 116	>10	17
	Dielectric Loss Factor	$x10^{-3}$	ASTM D 150	0.2	-
	Volume Resistivity @ 200°C	ohm-cm	-	10^{15}	10^{11}
	Volume Resistivity @ 400°C	ohm-cm	-	10^{12}	-
	Volume Resistivity @ 600°C	ohm-cm	-	10^{11}	10^{4}

Material Compound

Compound Name	Chemical Formula	Alumina C 799	Mullite C 610
Aluminum Oxide	Al_2O_3	>99.7%	>60%
Silicon Oxide	SiO_2	0.05%	37%
Iron Oxide	Fe_2O_3	0.06%	0.6%
Magnesium Oxide	MgO	0.15%	0.15%
Calcium Oxide	CaO	0.025%	0.025%

Disclaimer: The values presented are mean and typical of those resulted from test samples. They are provided as an indication only to serve as guidance in the design of ceramic components and are not guaranteed in any way. The actual values can vary according to the shape and size of the envisioned component.

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