

High Purity Alumina Ceramic Combustion Boat For Tube Furnaces And Material Synthesis

Item Number: KT-CZ



Introduction

Engineered for demanding thermal processing and vapor deposition this high purity ceramic boat provides superior thermal stability complete chemical inertness and zero cross contamination under extreme temperatures ensuring reliable sample containment across tube furnace synthesis calcination and advanced materials research

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Application	Description	Key Benefit
Chemical Vapor Deposition (CVD)	Serves as an inert solid precursor carrier inside horizontal quartz tube furnaces during 2D material synthesis, such as graphene and transition metal dichalcogenide growth.	Prevents precursor contamination and provides predictable vapor generation rates through controlled evaporation surfaces.
Solid-State Battery Synthesis	Accommodates sulfur-based solid electrolytes and precursors exposed to aggressive phosphorus pentasulfide vapors at elevated sintering temperatures.	Exhibits zero chemical reactivity against volatile sulfide species, maintaining phase purity and ionic conductivity targets.
Catalyst Preparation & Calcination	Holds heterogeneous catalyst supports and impregnated metal salts during high-temperature oxidation, reduction, and activation stages under gas flow.	Chemically neutral substrate ensures no leaching of catalyst poisons or interference with precious metal active sites.
Thermal Gravimetric & Combustion Analysis	Acts as a rigid sample vehicle for organic combustion, ash determination, and residual volatile matter quantification in carbonaceous fuels and minerals.	Zero baseline mass loss and non-hygroscopic fired matrix ensure analytical balance reproducibility and trace precision.
Rare Earth & Phosphor Annealing	Contains rare earth oxide powders and dopant mixtures subjected to long-duration dwell cycles within controlled hydrogen or inert atmospheres.	Resists high-temperature reduction and grain boundary diffusion, ensuring luminous efficiency and spectral consistency.
Metallurgy & Metal Powder Sintering	Supports reactive metal powders, magnetic alloys, and specialized braze alloys during sintering and heat treatment in high-vacuum or inert environments.	Eliminates alloy adhesion to the boat surface, facilitating clean part release and preserving stoichiometric ratios.

Specification Parameter	Standard Formulation (95% Al ₂ O ₃)	Premium High-Purity Formulation (99.7% Al ₂ O ₃)
Main Chemical Composition	≥ 95.0% Al ₂ O ₃ , balance SiO ₂ /CaO	≥ 99.7% Al ₂ O ₃ , trace MgO dopant
Maximum Continuous Operating Temperature	1450°C	1700°C
Maximum Intermittent Operating Temperature	1550°C	1800°C
Bulk Density	≥ 3.65 g/cm ³	≥ 3.92 g/cm ³
Apparent Porosity	< 0.5%	< 0.1% (Gas-tight)
Flexural Strength (Room Temperature)	≥ 280 MPa	≥ 360 MPa
Coefficient of Thermal Expansion (20-1000°C)	7.5 × 10 ⁻⁶ / °C	8.2 × 10 ⁻⁶ / °C
Thermal Conductivity (100°C)	22 W/(m·K)	30 W/(m·K)
Acid & Alkali Corrosion Resistance	Excellent	Outstanding
Vacuum Outgassing Rate	Negligible	Zero measurable volatile organic / water content

Model Identifier	Length (mm)	Width (mm)	Height (mm)	Wall Thickness (mm)	Nominal Capacity (mL)
KT-CZ-6015	60 ± 1.0	15 ± 0.5	10 ± 0.5	2.0	5.5
KT-CZ-8820	88 ± 1.0	20 ± 0.8	12 ± 0.5	2.2	12.0
KT-CZ-10025	100 ± 1.2	25 ± 0.8	15 ± 0.5	2.5	22.0
KT-CZ-12030	120 ± 1.5	30 ± 1.0	18 ± 0.8	2.8	40.0
KT-CZ-14040	140 ± 1.5	40 ± 1.0	22 ± 0.8	3.0	75.0
KT-CZ-16050	160 ± 2.0	50 ± 1.2	25 ± 1.0	3.5	130.0