

Alumina Ceramic Reducer Tube High Temperature Corundum Reducing Pipe

Item Number: KT-CYJ



Introduction

Engineered for demanding thermal environments our high purity corundum alumina ceramic reducer tubes deliver outstanding chemical corrosion resistance exceptional electrical insulation superior mechanical strength and minimal thermal expansion to optimize gas flow transitions and protect high temperature laboratory furnace systems reliably

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Application	Description	Key Benefit
Tube Furnace Atmospheric Transitions	Serves as the structural adapter between main process work tubes and gas exhaust or cooling flanges.	Eliminates thermal bypass, preserves chamber hermeticity, and prevents thermal degradation of metallic end seals.
Chemical Vapor Deposition (CVD/PECVD)	Couples reactant gas injection manifolds into high-temperature process chambers under vacuum.	Delivers zero volatile outgassing and prevents trace metal contamination in delicate thin-film deposition.
Molten Metal and Glass Melt Sampling	Directs and funnels molten alloy streams or slag samples during refining, extraction, and casting analysis.	Resists chemical attack, wetting, and slag adhesion while surviving continuous direct contact with molten phases.
Analytical Instrument Protection	Adapts thermocouple protective sheaths, optical pyrometer sight tubes, and gas analysis sampling probes.	Provides reliable electrical isolation and mechanical protection against aggressive furnace atmospheres.
Semiconductor Crystal Growth & Annealing	Connects variable-diameter quartz and ceramic conduits within wafer annealing and epitaxy chambers.	Guarantees high-purity integrity and prevents cross-contamination under sustained thermal processing.
Pilot-Scale Vacuum Metallurgy	Interfaces primary vacuum pumping lines to secondary thermal processing manifolds.	High mechanical strength maintains structural stability under negative pressure differential at elevated heat.
Catalyst Testing & Microreactor Systems	Provides a gradual cross-sectional transition between catalyst fixed beds and analytical transport tubing.	Minimizes flow turbulence, maintains uniform velocity profiles, and resists aggressive catalytic flue gases.

Specification Parameter	KT-CYJ-95 (Industrial Grade Alumina)	KT-CYJ-99 (High-Purity Corundum)	KT-CYJ-997 (Ultra-Purity Research Grade)
Base Material	Al2O3 (Alumina)	Al2O3 (Corundum Alumina)	Al2O3 (Recrystallized Corundum)
Aluminum Oxide Content (Al2O3)	≥ 95.0%	≥ 99.0%	≥ 99.7%
Maximum Continuous Operating Temperature	1500°C	1650°C	1800°C
Maximum Intermittent Operating Temperature	1600°C	1750°C	1850°C
Bulk Density	≥ 3.65 g/cm³	≥ 3.85 g/cm³	≥ 3.92 g/cm³
Apparent Porosity	< 0.5% (Gas-tight)	0% (Fully impervious)	0% (Fully impervious)
Flexural Strength (Bending Strength at 20°C)	≥ 280 MPa	≥ 350 MPa	≥ 400 MPa
Compressive Strength (at 20°C)	≥ 1800 MPa	≥ 2200 MPa	≥ 2500 MPa

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Thermal Expansion Coefficient (20°C to 1000°C)	$7.2 \times 10^{-6} /K$	$8.0 \times 10^{-6} /K$	$8.2 \times 10^{-6} /K$
Thermal Conductivity (at 100°C)	20 - 25 W/(m·K)	26 - 30 W/(m·K)	30 - 35 W/(m·K)
Dielectric Strength	15 kV/mm	18 kV/mm	22 kV/mm
Volume Resistivity (at 20°C)	$> 10^{14} \Omega \cdot \text{cm}$	$> 10^{14} \Omega \cdot \text{cm}$	$> 10^{15} \Omega \cdot \text{cm}$
Volume Resistivity (at 1000°C)	$> 10^7 \Omega \cdot \text{cm}$	$> 10^8 \Omega \cdot \text{cm}$	$> 10^9 \Omega \cdot \text{cm}$
Hardness (Mohs / Vickers)	9 Mohs / 1400 HV	9 Mohs / 1650 HV	9 Mohs / 1800 HV
Corrosion Resistance	Resistant to neutral & dilute acids	Excellent resistance to acids, alkalis, molten flux	Superior chemical inertness to nearly all molten media
Standard Concentric Reduction Ratio	2:1, 1.5:1, or custom specification	2:1, 1.5:1, or custom specification	2:1, 1.5:1, or custom specification
Outer Diameter Range (Large End)	20 mm – 200 mm	20 mm – 200 mm	10 mm – 150 mm
Outer Diameter Range (Small End)	10 mm – 120 mm	10 mm – 120 mm	5 mm – 100 mm
Length Range	50 mm – 600 mm	50 mm – 800 mm	50 mm – 1000 mm
Dimensional Tolerance	$\pm 1.0\%$ (unmachined) / ± 0.05 mm (ground)	$\pm 0.8\%$ (unmachined) / ± 0.02 mm (ground)	$\pm 0.5\%$ (unmachined) / ± 0.02 mm (ground)