ADCERAX
ADVANCED CERAMICS

ALUMINA TUBES

—— Four /4 Bore Alumina Tube

4 Bore Alumina Tube for Thermocouple Protection and Gas Flow in Furnaces

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About ADCERAX

Powered by **HUNAN ATCERA CO.,LTD** – A Trusted Innovator in Advanced Ceramics Since 2010 ,**HUNAN ATCERA CO. Ltd** has been deeply engaged in the field of advanced ceramics for 20 years, and has production experience of more than 2000 precision ceramic products. We focus on the material of alumina ceramics, zirconia ceramics, silicon carbide ceramics, silicon nitride ceramics, aluminum nitride ceramics and quartz, etc., and aim to provide you with advanced ceramics one-stop service.

Adcerax delivering bespoke advanced ceramic solutions for industries where precision and durability matter.And has become a leading global China supplier of alumina ceramic tubes, with products exported to the United States, Germany, Japan, South Korea, and many other countries.

Our Expertise

- **Engineering Support:** Professional product engineers providing timely technical assistance from design to production.
- **Customization Capability:** Accepting small-batch custom orders based on customer drawings or samples.
- **Rapid Delivery:** Quick shipping for custom orders and 24-hour dispatch for in-stock standard products.
- **Supply Chain Integration:** One-stop customization and procurement services leveraging China's supply chain advantages.

ADCERAX Promise

Your ROI Starts from Day One

- ↑ 37% Lifespan: Industry Standards Verified by SGS Third-Party Testing in Extreme Thermal Shock Environments
- ↓ 22% Downtime: Reduce unplanned downtime with ceramic component life enhancement
- ⚡15 days fast response: From drawing confirmation to functional prototype delivery
- 🛡️12 months warranty: Unconditional return of quality problems to factory for remanufacturing + process optimization report

Our Certifications

What is 4 bore alumina tube?

A 4 bore alumina tube is a high-temperature ceramic tube made from high-purity aluminum oxide (typically ≥95% Al2O3) that contains four parallel internal channels (bores) running along its length. These bores are evenly spaced and isolated from each other, allowing the tube to be used for multiple functions simultaneously, such as:

- Housing multiple thermocouple wires for temperature measurement
- Separating different gas flows in analytical or reaction systems
- Providing electrical insulation for multiple conductors in high-temperature environments

4 Bore Alumina Tubes Process

Raw Material Preparation

Alumina powder is selected and mixed with binders and plasticizers to form a uniform slurry or paste.

Forming

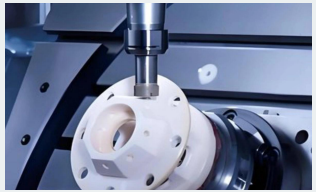
Extrusion: Alumina slurry is extruded through a die into continuous tubular shapes.
Isostatic Pressing: Powder is molded under high pressure to form high-density, uniform tubes.
Slip Casting: Liquid slurry is cast into a mold and solidified.

Drying

The formed tubes are dried slowly to remove moisture and prevent cracking or deformation.

Sintering

The dried tubes are fired in a high-temperature kiln (typically 1600–1700°C) to achieve full densification and develop the final ceramic properties.



Machining

After sintering, the tubes may be ground or machined to achieve precise dimensions, surface finish, or special features such as chamfered ends or holes.

4 Bore Alumina Tube Properties

Property	Unit	99.7% Al2O3	99.5% Al2O3	99% Al2O3	96% Al2O3
Color		Ivory White	Ivory White	Ivory White	Ivory White
Density	g/cm³	3.94	3.9	3.83	3.6-3.75
Water Absorption	%	0	0	0	0
Hardness	Mohs Hardness	9.1	9	9	8.8
Flexural Strength (20°C)	Mpa	330	320	300	260
Compressive Strength (20°C)	Mpa	2300	2300	2210	1910
Maximum Operating Temperature	°C	1730	1700	1680	1450
Thermal Expansion Coefficient (25°C to 800°C)	10^{-6}/°C	7.6	7.6	7.6	7.6
Thermal Conductivity (25°C)	W/(m·K)	29	27	24	22
Dielectric Strength (5mm thickness)	AC-kv/mm	22	21	19	15
Dielectric Loss at 25°C@1MHz	---	< 0.0001	< 0.0001	0.0003	0.0004
Dielectric Constant at 25°C@1MHz	---	9.8	9.7	9.5	9.2
Volume Resistivity (20°C)	Ω·cm³	$>10^{14}$	$>10^{14}$	$>10^{14}$	$>10^{14}$
Volume Resistivity (300°C)	Ω·cm³	$2*10^{12}$	$2*10^{12}$	$4*10^{11}$	$2*10^{11}$

Technical Advantages

Excellent High-Temperature Resistance

Maximum operating temperature up to 1730° C (99.7% Al2o3), meeting extreme high-temperature environment demands.

Superior Electrical Insulation

Volume resistivity >10^{14} Ω·cm^3, dielectric strength up to 22 AC-kv/mm (5mm thickness).

High Dimensional Accuracy

Tolerance up to ±0.2mm, ensuring precise installation and use.

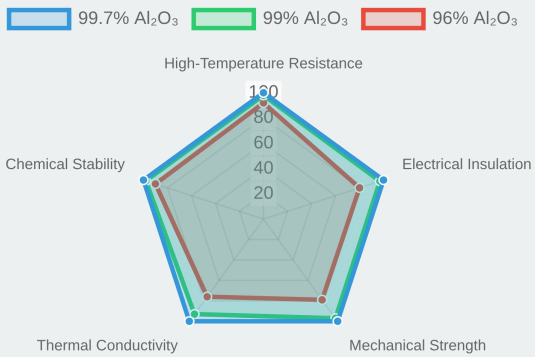
Chemical Stability

Resistant to acids, alkalis, and corrosive gases, suitable for various harsh environments.

Structural Integrity

Flexural strength 330 Mpa, compressive strength 2300 Mpa, with excellent mechanical properties.

Performance Comparison of Alumina Ceramics with Different Purity



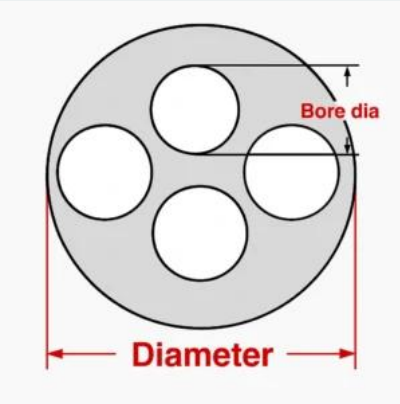
4 Bore Alumina Tube Specifications

ADCERAX 4 bore alumina tubes are engineered for high-temperature applications requiring multi-channel insulation or gas separation. Available in a range of standard sizes and customizable configurations.

Specification Parameter	Details
Product No.	TE-AT-138
Material	Al2O3(Alumina)
Purity Options	95% / 99% / 99.5% / 99.7%
Max. Working Temp.	1450° C (95%) - 1730° C (99.7%)
Bore Options	2/4/ 6 / 8 / 9 / 10 / 16 (Customizable Layout)
Standard Outer Diameter	1.5mm - 16mm
Standard Inner Diameter	0.3mm - 4.0mm
Standard Length	≤3000mm

Key Features of 4 Bore Alumina Ceramic Tubes

- High Temperature Stability
- Excellent Electrical Insulation
- High Dimensional Accuracy
- Good Chemical Stability



4 Bore Alumina Tube Size

ADCERAX offers a variety of 4-bore alumina ceramic tube specifications to meet the needs of different applications. Below is our standard dimension specification table, and all products can be customized according to customer requirements.

Item No.	Diameter (mm)	Bore Dia.(mm)	Length Available	Purity Available
TE-AT-138	1.5	0.3	≤3000mm	95%,99%, 99.5%
TE-AT-139	2.0	0.4		
TE-AT-140	2.5	0.6		
TE-AT-141	3.0	0.8		
TE-AT-142	3.5	0.8		
TE-AT-143	3.5	1.0		
TE-AT-144	4.0	1.0		
TE-AT-145	4.0	1.3		
TE-AT-146	4.5	1.2		
TE-AT-147	5.0	1.2		

Item No.	Diameter (mm)	Bore Dia.(mm)	Length Available	Purity Available
TE-AT-148	5.5	1.3	≤3000mm	95%,99%, 99.5%
TE-AT-149	6.0	1.3		
TE-AT-150	6.5	1.4		
TE-AT-151	8.0	2.0		
TE-AT-152	8.5	2.2		
TE-AT-153	10.0	3.0		
TE-AT-154	12.0	3.9		
TE-AT-155	14.0	3.9		
TE-AT-156	16.0	4.0		

Note: The table above shows only some standard specifications. For more specifications, please refer to the complete product catalog or contact us for customization.

Successful Application Cases

ADCERAX's 4-bore alumina ceramic tubes have been successfully applied in various industries, solving critical challenges for customers in high-temperature, insulation, and multi-channel applications.

Thermocouple Protection in Laboratory High-Temperature Furnaces

A research institution needed to conduct material sintering experiments at 1600°C, requiring thermocouples to measure accurately and operate stably for extended periods. Our 99.7% high-purity 4-bore alumina ceramic tubes successfully solved the thermocouple protection problem.

Result: Thermocouple lifespan extended by 37%, temperature measurement accuracy improved by 15%, reducing experiment interruptions due to thermocouple damage.

Multi-Channel Gas Delivery in Industrial Heating Systems

An industrial heating equipment manufacturer needed to simultaneously deliver multiple protective gases in high-temperature areas, requiring pipes with excellent thermal stability and chemical inertness. Our customized 4-bore alumina ceramic tubes perfectly met this demand.

Result: System stability improved by 42%, gas purity retention reached 99.8%, and equipment maintenance cycles extended to twice the original.

Electrode Isolation in Semiconductor Manufacturing Equipment

A semiconductor equipment manufacturer needed to isolate multiple sets of electrodes in a high-temperature plasma environment, requiring materials with extremely high electrical insulation and dimensional accuracy. Our 4-bore alumina ceramic tubes were recognized by customers for their excellent electrical insulation performance and precise dimensional control of ±0.2mm.

Result: Equipment stability improved by 28%, production yield increased by 8.5%, significantly reducing equipment failure rates due to insulation issues.

High-Temperature Fluid Transfer in Chemical Processing

A chemical plant required a durable solution for transferring corrosive fluids at temperatures exceeding 1000°C. Our 4-bore alumina ceramic tubes provided the necessary resistance to chemical attack and thermal shock.

Result: Reduced downtime for pipe replacement by 60%, improved process safety.

Customization Services

4 bore alumina tube is designed for high-temperature applications requiring electrical insulation and gas or wire separation. It is available in standard sizes and can also be customized in terms of length, bore configuration, and end structure

Customizable Parameters

Outer Diameter
OD 3–220 mm(±0.05-5mm), contact us for other sizes.

Inner Bore Diameter
0.25mm to 10mm (±0.05-2mm), contact us for other sizes

Length
Up to 3000mm, meeting various application needs.

Bore Count
Standard 4-bore, customizable to 2/6/8/9/10/more bores or other configurations.

End Detail
Open, closed or flanged, and other end treatments.

Cross-Sectional Shape
round, square, rectangular, or custom cavity or other shapes customized upon request.

Customization Process

1. **Inquiry & Design** — Submit your **detailed** requirements
2. **Mold & Samples** — Proceed with mold/sample creation
3. **Confirmation** — Confirm specifications and contract
4. **Delivery** — Safe and efficient shipping

Fast Response Commitment

From drawing confirmation to functional prototype delivery

15 Days

Product Usage Guide

How To Use

- Insert thermocouple wires or gas lines into each bore.
- Ensure proper sealing at both ends using ceramic caps or high-temperature sealants.
- Avoid mechanical stress during installation to prevent cracking.

Maintenance & Care

- Store in a dry, vibration-free environment.
- Avoid stacking heavy items on top of the tubes.

Cleaning

- Clean with isopropyl alcohol or deionized water.
- Avoid using metal brushes or abrasive tools.

Common Mistakes

- Over-tightening clamps may cause microcracks.
- Rapid thermal shock (>300°C/min) may lead to fracture.
- Using in reducing atmospheres may degrade alumina over time.

Safety Precautions

- **High-Temperature Protection:** - Use insulated gloves and tools, avoid direct contact.
- **Fracture Risk**- Avoid mechanical impact and excessive stress to prevent injuries.
- **Dust Protection**- Wear respiratory protection when machining or cutting.

Technical Support

Technical Inquiry: info@adcerax.com
Service Hotline: +86-0731-84428843
Whatsapp: +86-19311583352

4 Bore Alumina Tube FAQ

- **Q: Can I get a custom bore layout?**
  A: Yes, we support custom bore numbers and spacing based on your drawing.
- **Q: What is the tolerance for inner and outer diameters?**
  A: Standard tolerance is ±0.2mm for OD and ±0.1mm for ID.
- **Q: Can I use this tube for thermocouple protection?**
  A:Yes, it is widely used for K, S, and B-type thermocouples.
- **Q: Is this tube resistant to acids or alkalis?**
  A: Alumina is chemically inert to most acids and alkalis except HF.
- **Q: Is the tube glazed or unglazed?**
  A: Standard finish is unglazed; polished or sandblasted options are available.
- **Q: Do you offer technical drawing support?**
  A: Yes, our engineers can assist with CAD drawings and design optimization.

Service Support

ADCERAX is committed to providing comprehensive service support to customers, from product selection to after-sales maintenance.

Pre-Sales Support

- Expert technical team provides custom design advice
- Sample testing and performance verification
- Technical parameter consultation

Sales Support

- Order tracking and production progress updates
- Professional packaging and logistics solutions

After-Sales Service

- Product quality assurance and problem resolution
- Technical consultation and application support
- 24-hour response commitment

Quality Assurance

- Strict quality control system
- Product performance testing and verification

Related Products

- Ceramic End Caps
- Ceramic Heating Rods
- Ceramic Insulators
- Thermocouple Assemblies

Contact Our Specialist Team

Customer Service: info@adcerax.com

Service Hotline: +86-0731-84428843

Online Support: adcerax.com/support

Contact Us

ADCERAX looks forward to cooperating with you and providing high-quality 4 bore alumina tube solutions. Our team is dedicated to serving you with any questions or needs you may have.

Contact Information

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Inquiry Process

1. **Submit Inquiry**
   Submit your requirements via email, phone, or website form.
2. **Technical Evaluation**
   Our expert team evaluates your needs and provides solutions.
3. **Quotation Confirmation**
   Provide detailed quotation and delivery time based on your requirements.
4. **Order Confirmation**
   Confirm order and arrange production and delivery.

Get in touch with us

We promise to respond to your inquiry within 24 hours.

Ready to enhance your product performance with our alumina four bores tube? Contact our team for personalized consultation, technical support, and competitive quotations.

Get A Quote