ADCERAX
ADVANCED CERAMICS

Zirconia Porous Filter Tube

For Stable Filtration, Lower Downtime and Custom Process Fit

Contact Information

- Tel: +86-0731-84428843
- Whatsapp: +86-19311583352
- E-mail: info@adcerax.com
- Website: https://adcerax.com
- Address: Building 108, Industrial Park, Liling city Hunan Province, China

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 zirconia 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

CNAS ISO 水圆认证 CQM CERTIFICATION RoHS COMPLIANT

What is Zirconia Porous Filter Tube?

A zirconia porous filter tube is a tubular ceramic filter made from zirconium oxide with a controlled porous structure. It is designed to let gases or liquids pass through while trapping particles, contaminants, or impurities.

Typical uses:

- Hot gas filtration
- Liquid purification
- Chemical processing systems
- Laboratory and industrial separation equipment
- Harsh environments requiring ceramic filtration

Zirconia Porous Filter Tube Process

Raw Material Preparation

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

Forming

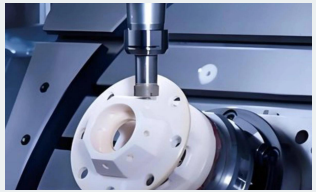
Extrusion: Alumina slurry is extruded through a die into continuous tubular shapes.
Isostatic Pressing: Powder is molded under high pressure to form high-density, uniform tubes.
Slip Casting: Liquid slurry is cast into a mold and solidified.

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.

Zirconia Porous Filter Tube Properties

Property	Specification
Density	5.6–5.9 g/cm³ (measured bulk density of stabilized zirconia)
Flexural Strength	≥900 MPa (tested under three-point bending)
Fracture Toughness	8–10 MPa·m$^{1/2}$ (higher than alumina membranes)
Thermal Expansion Coefficient	10.5 ×10^{-6} /K (25–600°C range)
Chemical Resistance	Stable in pH 2–12, >95% strength retention after 500 h acid exposure
Acid/Base Durability	Survives >200 cleaning cycles with HCl/NaOH solutions
Porosity	35–40% open porosity, enabling efficient fluid flux

Selection guidance

If the current filter element is limited by aggressive CIP chemicals, solvent exposure, or unstable flow after repeated cleaning, zirconia offers a more durable upgrade path focused on process stability, cleaning tolerance, and longer service life.

Porosity: 35–40% • Flux decline after 1000 h: <10% • Acid/base cleaning cycles: >200

Technical Advantages

Designed to keep flux stable in harsh chemistry, repeated cleaning and thermal cycling.

High mechanical margin

Flexural strength ≥900 MPa and fracture toughness 8–10 MPa·$m^{1/2}$ help the tube resist handling stress and pressure fluctuations.

Chemical durability

Stable across pH 2–12 and retains >95% strength after 500 hours in acidic media.

Thermal resilience

Continuous service up to 600°C, short-term ≤800°C, with >50 heating-cooling cycles reported without cracking.

Low lifecycle cost

Service life in wastewater applications is presented as 3–5 years, with replacement frequency reduced by over 40% versus shorter-life alternatives.

Consistent filtration performance

Uniform pore structure supports stable flow distribution and reliable particle retention, helping reduce blockage risk and maintain process consistency over extended use.

Global OEM Supply

Factory-direct pricing, 24h dispatch for standard sizes

Zirconia Porous Filter Tube

Porous Zirconia Tube for High-Temperature Filtration and Gas Distribution

SPECIFICATIONS

Material	**Yttria Stabilized Zirconia (YSZ)**
Typical Purity	**ZrO_2 + Y_2O_3 stabilized**
Max Temperature	**Up to 2200°C**
Density	**5.65-6.05 g/cm³**
Customization	**Custom OD, ID, length, and wall thickness available**

APPLICATIONS

Gas Filtration · Air Sparging · Diffusion Systems · Chemical Processing · Powder Handling · High-Temperature Industrial Equipment

KEY FEATURES

1. Engineered pore structure helps balance permeability and filtration performance
2. Good thermal and chemical stability for demanding operating conditions
3. Custom pore and size options support different process requirements
4. Designed for reliable service in filtration and gas distribution systems

Zirconia Porous Filter Tube Applications

Electroplating wastewater

Challenge

Corrosive Ni/Cr effluent, unstable polymer modules, frequent changeover.

What changes after switching

ADCERAX reports flux within ±8% over 12 months, chemical spend reduced by about 35%, and membrane-service downtime cut from 18 h/month to below 7 h/month.

Fit indicator:

Best for acidic or metal-rich wastewater lines.

Brewery clarification

Challenge

Fouling, short runs and inconsistent final turbidity during peak demand.

What changes after switching

Run length increased to 72–96 h between CIP, turbidity stabilized at 0.4–0.6 NTU, and packaging downtime fell by about 30%.

Fit indicator:

Best for sanitary clarification requiring repeatable CIP.

Solvent-laden pigment effluent

Challenge

Weekly filter swaps, high COD carryover and time-consuming caustic cleaning.

What changes after switching

Pre-RO COD dropped by 40–60%, weekly swaps were eliminated, and filtration-step OPEX decreased by about 20%.

Fit indicator:

Best for solvent-heavy and chemically aggressive streams.

Customization Services for Zirconia Porous Filter Tube

When standard sizes do not fit the system, ADCERAX provides application-based customization to optimize dimensions, wall structure, and end finishing for the actual installation.

Customizable Parameters

Dimensional adaptation

- Outer Diameter — Matched to housing design
- Inner Channel — Optimized for flow path
- Length — Flexible to module needs

Pore Structure Options

- Pore Size — Supports precise separation
- Porosity — Balances flux and strength
- Distribution — Helps maintain stable results

Surface treatment

- Flat Ends — Easy sealing and fitting
- Machined Ends — Precise, leak-resistant connection
- Threaded Ends — Secure for industrial assembly

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

Zirconia Porous Filter Tube Usage Guide

Installation Recommendations

- Inspect Before Use — Check for cracks or surface defects before installation.
- Proper Orientation — Install in the correct flow direction to avoid early flux loss.
- Secure Fittings — Tighten seals evenly to prevent stress concentration.

Operating Guidelines

- Maintain pH Range — Operate within pH 2–12 to reduce chemical attack.
- Control Pressure — Keep pressure within the recommended limit to protect flux stability.
- Monitor Temperature — Continuous use should stay within the specified temperature range.

Cleaning and Maintenance

- Scheduled Cleaning — Clean at regular intervals to maintain stable flux.
- Use Approved Agents — Avoid aggressive solvents that may damage the pore structure.
- Record Performance — Track flux and pressure to detect fouling early.

Storage and Handling

- Dry and Cool Storage — Store in a clean, dry environment.
- Protective Packaging — Use reinforced packaging during transport and storage.
- Avoid Sudden Impact — Handle carefully to prevent hidden cracks.

Technical Support

Technical Inquiry: info@adcerax.com

Service Hotline: +86-0731-84428843

Whatsapp: +86-19311583352

Zirconia Porous Filter Tube FAQ

Q: How does the Zirconia Porous Filter Tube perform in highly corrosive wastewater?

A: The Zirconia Porous Filter Tube operates stably in pH 2–12 environments, making it suitable for electroplating or chemical wastewater. Its resistance to acids and alkalis prevents early structural failure. This feature minimizes downtime and ensures reliable long-term operation.

Q: Can the Zirconia Porous Filter Tube withstand repeated cleaning cycles?

A: Yes, the Zirconia Ceramic Porous Filter Tube has been tested for >200 CIP cycles with NaOH and HCl solutions. It maintains flux recovery above 90% after each cleaning, ensuring consistent separation. This durability reduces the frequency of membrane replacement.

Q: How does the Zirconia Porous Filter Tube handle temperature fluctuations?

A: It resists thermal shock, supports continuous use up to 600°C, and withstands 50+ heating–cooling cycles without cracking.

Q: Why is pore size uniformity important in the Zirconia Porous Filter Tube?

A: Uniform 0.1–0.2 μm pores support stable microfiltration, with flux decline below 10% after 1000 hours.

Q: How does the Zirconia Porous Filter Tube reduce fouling compared to polymer membranes?

A: Its ceramic surface helps reduce organic buildup, cutting fouling frequency by up to 40% and extending cleaning intervals.

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

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 zirconia tube solutions. Our team is dedicated to serving you with any questions or needs you may have.

Contact Information

+86-0731-84428843
info@adcerax.com
+86-19311583352
adcerax.com
Building 108, Industrial Park, Liling city Hunan Province, China

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 zirconia tube? Contact our team for personalized consultation, technical support, and competitive quotations.

Get A Quote