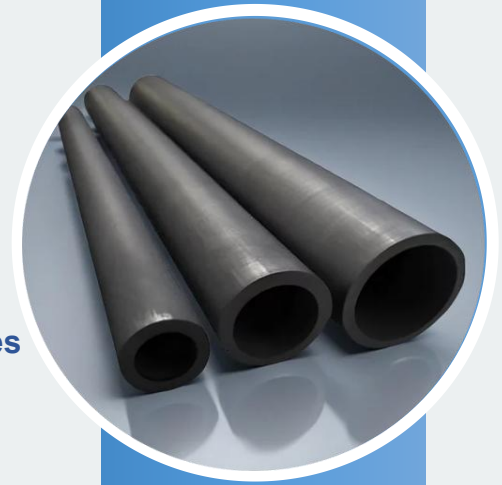
ADCERAX
ADVANCED CERAMICS

Silicon Carbide Protection Tube



Thermo-Stable Silicon Carbide Protection Tubes for Industrial Heating Lines

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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 silicon carbide Tube, 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 Silicon Carbide Protection Tube?

A Silicon Carbide Protection Tube is a dense, high-temperature ceramic tube used to protect thermocouples, sensors, or internal components in harsh industrial environments. It acts as a barrier between the instrument and the process media, helping the system resist heat, wear, oxidation, molten metal attack, and corrosive gases.

Typical applications

- Molten aluminum and non-ferrous metal processing
- High-temperature furnaces and kilns
- Sulfur-bearing or corrosive gas lines
- High-velocity burner and heat-treatment zones

Silicon Carbide Protection Tube Process

Raw Material Preparation

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

Forming

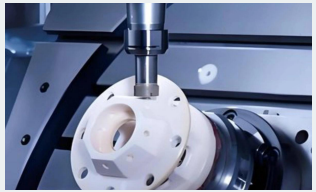
Extrusion: Alumina slurry is extruded through a die into continuous tubular shapes.
Isostatic Pressing: Powder is molded under high pressure to form high-density, uniform tubes.
Slip Casting: Liquid slurry is cast into a mold and solidified.

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.

Silicon Carbide Tube Properties

Item	Unit	RBSiC (SiSiC)	SSiC	NBSiC
Full Name	—	Reaction Bonded Silicon Carbide	Sintered Silicon Carbide	Nitride Bonded Silicon Carbide
SiC Content	W%	80	99	80
Free Si	W%	20	0	0
Si_3N_4 Content	W%	0	0	20
Max. Service Temperature	°C	≤1380	≤1600	≤1550
Density	g/cm³	3.02	3.1	2.8
Apparent Porosity	%	<0.1	<0.1	12
Flexural Strength (20°C)	MPa	250	380	160
Flexural Strength (1200°C)	MPa	280	400	180
Elastic Modulus	GPa	330	420	220
Thermal Conductivity (1000°C)	W/m·K	45	74	15
Thermal Expansion Coefficient	$K^{-1} \times 10^{-6}$	4.5	4.1	5
Hardness	kg/mm²	2600	2800	2600

Why Silicon Carbide Protection Tube

Engineered for temperature measurement points that fail under combined heat, corrosion, erosion, and cycle shock.

1600-1650 C
Maximum service temperature in air

Up to 1900 C
Controlled atmosphere capability

90-120 W/m.K
Thermal conductivity for lower thermal lag

HV > 2200
Hardness against particle erosion

Where buyers usually need it

Molten aluminum degassing and refining, sulfur-bearing gas heating lines, burner zones, and continuous process heating systems where tube life and reading stability both matter.

What it protects against

Wetting, gas penetration, oxidation, abrasion, thermal lag, crack initiation under rapid cycling, and drift caused by unstable heat transfer to the sensing core.

Why buyers move away from conventional options

In severe-duty lines, conventional oxide or metallic sheaths may require frequent replacement, cause unstable readings, or fail early from erosion and corrosive attack. SiC is chosen when lifecycle reliability matters more than lowest first-piece cost.

Best-fit application snapshot

Application	Primary failure risk	Why SiC is selected
Molten aluminum refining	Wetting, erosion, measurement drift	Non-wetting surface + fast heat transfer
SO2 / H2S heating lines	Gas attack, porous tube degradation	Low porosity + chemical stability
High-velocity burner zones	Particle erosion, flame impact	High hardness + flexural strength

Silicon Carbide Protection Tube

High-Temperature Silicon Carbide Protection Tube

SPECIFICATIONS

Material	**SSiC (Sintered Silicon Carbide) / RBSiC (Reaction-Bonded Silicon Carbide)**
Typical Grade	**RBSiC / SSiC / NBSiC**
Max Temperature	**Up to 1380–1600°C**
Density	**2.8–3.1 g/cm³**
Customization	**Custom size and wall thickness available**

APPLICATIONS

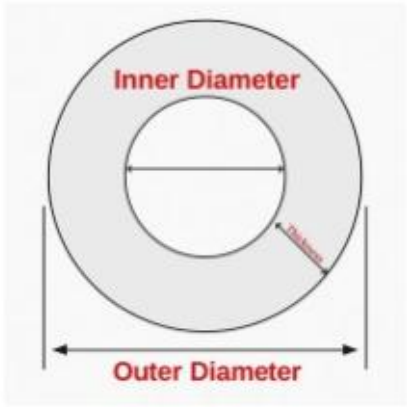
Thermocouple Protection · Furnace Monitoring · Molten Metal Service · Heat Treatment · Kiln Equipment · Corrosive Gas Handling

KEY FEATURES

1. Protects thermocouples and sensors in high-temperature and corrosive service environments.
2. Offers strong resistance to oxidation, wear, and thermal shock.
3. Maintains structural stability under continuous furnace operation.
4. Supports longer service life in demanding measurement and protection duties.

🎯 Silicon Carbide Protection Tube Size:

Type1- SIC Protection Tube One End Closed



Item	Outer Diameter(mm)	Inner Diameter(mm)	Length(mm)	Purity
AT-THG-G1001	20	10	500	92%
AT-THG-G1002	25	15	500	92%
AT-THG-G1003	30	20	500	92%
AT-THG-G1004	35	25	500	92%
AT-THG-G1005	40	30	500	92%
AT-THG-G1006	45	35	500	92%
AT-THG-G1007	50	40	500	92%
AT-THG-G1008	55	45	500	92%
AT-THG-G1009	60	50	500	92%
AT-THG-G1010	70	25	850	99%
AT-THG-G1011	70	30	850	99%
AT-THG-G1012	90	63	1000	99%
AT-THG-G1013	100	73	1250	99%
AT-THG-G1014	110	80	1200	99%
AT-THG-G1015	119	99	1050	99%
AT-THG-G1016	120	95	1200	99%
AT-THG-G1017	133	105	430	99%

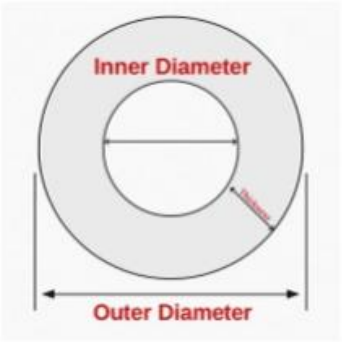
🎯 Silicon Carbide Protection Tube Size:

Item	Outer Diameter(mm)	Inner Diameter(mm)	Length (mm)	Purity
AT-THG-G1018	155	130	1040	99%
AT-THG-G1019	168	140	430	99%
AT-THG-G1020	273	243	700	99%
AT-THG-G1021	280	230	1500	99%
AT-THG-G1022	20	8	1000	99%
AT-THG-G1023	25	13	1500	99%
AT-THG-G1024	30	18	1500	99%
AT-THG-G1025	35	23	1500	99%
AT-THG-G1026	40	26	1600	99%
AT-THG-G1027	50	35	1600	99%
AT-THG-G1028	60	40	1600	99%
AT-THG-G1029	20	10	500	99%
AT-THG-G1030	25	15	500	99%
AT-THG-G1031	30	20	500	99%
AT-THG-G1032	35	25	500	99%
AT-THG-G1033	40	30	500	99%

Item	Outer Diameter(mm)	Inner Diameter(mm)	Length (mm)	Purity
AT-THG-G1034	45	35	500	99%
AT-THG-G1035	50	40	500	99%
AT-THG-G1036	55	45	500	99%
AT-THG-G1037	60	50	500	99%

🎯 Silicon Carbide Protection Tube Size:

Type2- SIC Protection Tube



Item	OD(mm)	ID(mm)	L(mm)	Purity
AT-THG-G2001	22	12	1000	99%
AT-THG-G2002	28	18	1000	99%
AT-THG-G2003	32	10	1000	99%
AT-THG-G2004	38	28	1000	99%
AT-THG-G2005	42	32	1000	99%
AT-THG-G2006	47	37	1000	99%
AT-THG-G2007	56	46	1000	99%
AT-THG-G2008	55	45	1000	99%
AT-THG-G2009	68	56	1000	99%
AT-THG-G2010	40	20	500	99%
AT-THG-G2011	30	18	500	99%
AT-THG-G2012	40	25	500	99%
AT-THG-G2013	30	18	400	99%
AT-THG-G2014	40	40	400	99%
AT-THG-G2015	70	25	850	99%
AT-THG-G2016	70	30	850	99%
AT-THG-G2017	90	63	1000	99%

🎯 Silicon Carbide Protection Tube size:

Item	OD(mm)	ID(mm)	L(mm)	Purity
AT-THG-G2018	105	70	1250	99%
AT-THG-G2019	104	82	1200	99%
AT-THG-G2020	120	100	1050	99%
AT-THG-G2021	115	90	1200	99%
AT-THG-G2022	128	90	430	99%
AT-THG-G2023	150	140	1040	99%
AT-THG-G2024	170	140	430	99%
AT-THG-G2025	270	240	700	99%
AT-THG-G2026	285	235	1500	99%
AT-THG-G2027	22	10	1000	99%
AT-THG-G2028	25	13	1500	99%
AT-THG-G2029	30	18	1500	99%
AT-THG-G2030	35	23	1500	99%
AT-THG-G2031	40	26	1600	99%
AT-THG-G2032	50	35	1600	99%
AT-THG-G2033	60	40	1600	99%

Customization Services for SiC Protection Tube

When standard tubes do not fit the system, ADCERAX provides application-based customization for Silicon Carbide Protection Tubes to match actual installation, thermal duty, and service conditions.

Customizable Parameters

Dimensional adaptation

- Outer Diameter — Matched to mounting space and furnace layout
- Inner Diameter — Sized for thermocouple or sensor fit
- Length — Customized to immersion depth or insertion distance

Structure and End Design

- Wall Thickness — Balanced for strength, heat response, and service life
- Open or Closed End — Selected by measurement method and process exposur
- Chamfered or Special Ends — Improved fo safer installation and assembly fit

Installation and Service Matching

- Threaded Ends — Secure connection for fixed industrial mounting
- Machined Connection Area — Better fit with holders, flanges, or seals
- Application-Based Design — Adjusted for molten metal, corrosive gas, or burner-zone duty

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

Silicon Carbide Protection Tube Applications

Molten aluminum degassing and refining

Challenge

Oxide tubes can wet, erode, and drift during molten aluminum immersion, which often leads to unstable gas delivery and more frequent replacement.

Why SiC works

SiC offers low wetting behavior, strong wear resistance, and fast heat transfer, helping the tube stay more stable in continuous duty around 700–750°C.

Observed result

One plant application extended the replacement interval from about 2–3 weeks to roughly 3–4 months under the same schedule.

Sulfur-bearing gas heating lines

Challenge

SO2 and H2S gas streams can attack porous tube materials, causing internal degradation and shortening service life.

Why SiC works

Porosity below 0.1% and a chemically stable SiC matrix help limit gas penetration, reduce surface attack, and support longer-term stability.

Observed result

A cited case reported service life beyond 6 months and about 50% fewer shutdowns related to tube failure.

High-velocity burner zones

Challenge

Burner zones combine flame impact, hot particles, and thermal cycling, which can wear softer tubes quickly and reduce service life.

Why SiC works

SiC combines high hardness, good flexural strength, and strong abrasion resistance, making it suitable for demanding gas flow conditions above 30–40 m/s.

Observed result

Field feedback shows better wear resistance, longer operating life, and improved furnace temperature uniformity.

Silicon Carbide Protection Tube Usage Guide

Pre-Installation Handling Requirements

- Initial Inspection Check for cracks, chips, or surface damage before use.
- Storage Conditions Store in a dry, clean place and protect from impact.
- Handling Protection Use padded support and avoid hard contact during transport.

Installation Guidelines for High-Temperature Systems

- Gradual Heating Heat gradually to reduce thermal shock, especially above 1000°C.
- Correct Positioning install in the proper position to keep heat exposure even.
- Sensor Fitment Keep the sensor centered and allow clearance for expansion.

Operation in Molten Metal and Corrosive Gas Environments

- Stable Immersion Keep immersion depth steady to reduce stress and wear.
- Gas Conditions Maintain stable airflow and avoid corrosive deposit buildup.
- Thermal Cycling Control Control heating and cooling rates to extend service life.

Maintenance, Inspection, and Service Life Extension

- Routine Checks Inspect regularly for wear, discoloration, or erosion.
- Proper Cleaning Use non-abrasive cleaning methods only.
- Replacement Timing Replace the tube when cracks, wear, or erosion become visible.

Technical Support

Technical Inquiry: info@adcerax.com

Service Hotline: +86-0731-84428843

Whatsapp: +86-19311583352

Silicon Carbide Protection Tube FAQ

- **Q: How does a Silicon Carbide Protection Tube maintain stability during molten metal immersion?**
  A: Its dense SiC matrix shows negligible wetting in molten metal, helping protect the surface, reduce drift, and extend immersion life.

- **Q: Why is a Silicon Carbide Protection Tube preferred for rapid thermal cycling environments?**
  A: It withstands temperature gradients above 600 ° C/min, reducing crack risk during fast heating and cooling.

- **Q: How does a Silicon Carbide Protection Tube resist corrosion in sulfur-bearing gas lines?**
  A:Porosity below 0.1% helps block SO_2 , H_2 S, and oxidizing gases, reducing internal attack and surface degradation.

- **Q: What supports the long service life of a Silicon Carbide Protection Tube in high-velocity burner zones?**
  A: Hardness above HV 2200 and flexural strength above 350 MPa help resist erosion, flame impact, and wear.

- **Q: How does a Silicon Carbide Protection Tube maintain measurement accuracy over long operating cycles?**
  A: Thermal conductivity of 90–120 W/m·K supports fast heat transfer and stable sensor response over long cycles.

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

Get A Quote