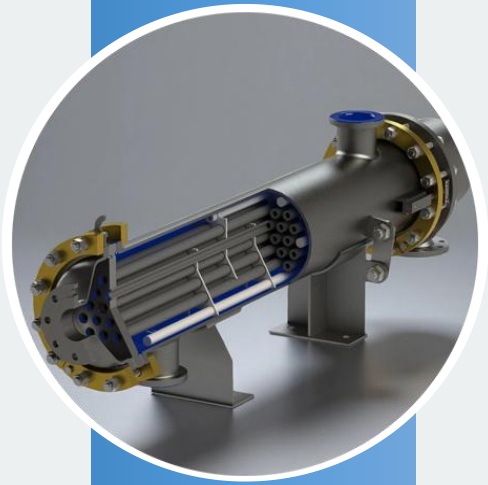
ADCERAX
ADVANCED CERAMICS

Silicon Carbide Heat Exchanger Tube



——Built for corrosive media, high thermal load and stable energy recovery in industrial process systems.

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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

What is Silicon Carbide Heat Exchanger Tube?

Silicon Carbide Heat Exchanger Tube is a high-performance ceramic tube used as the core heat-transfer component in heat exchanger systems handling corrosive media, high temperatures, or severe thermal cycling.

It is commonly used for

- Chemical heat recovery
- Corrosive liquid heating or cooling
- Vapor condensation
- Refinery process service

Silicon Carbide Heat Exchanger Tube Process

Raw Material Preparation

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

Forming

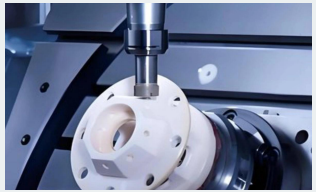
Extrusion: Alumina slurry is extruded through a die into continuous tubular shapes.
Isostatic Pressing: Powder is molded under high pressure to form high-density, uniform tubes.
Slip Casting: Liquid slurry is cast into a mold and solidified.

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 Heat Exchanger 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 this SiC design outperforms metal, glass-lined and graphite options?

The product value becomes visible when the exchanger is exposed to acid attack, vibration, fouling risk or repeated thermal cycling.

Corrosion stability

Mass-loss rate stays below 0.1% in HF, HCl and mixed-acid testing, so service life remains more predictable in aggressive media.

Fast heat transfer

Thermal conductivity of 120-150 W/m·K improves temperature response and can reduce required exchange area versus lower-conductivity alternatives.

Mechanical strength

Flexural strength above 350 MPa and compressive strength above 2200 MPa support stable operation under vibration and continuous load.

Thermal-shock reliability

The bonded SiC structure is rated for Delta T >= 250°C class conditions, making it suitable for start-stop and fluctuating thermal duty.

Leak-control design

Reinforced ceramic seals and bonded joints are reported with leakage below 0.01%, helping protect process separation and safety.

Silicon Carbide Heat Exchanger Tube

Efficient heat transfer with strong corrosion resistance in high-temperature service

SPECIFICATIONS

Material	**Silicon Carbide (SiC)**
Typical Use	**Heat exchange and thermal transfer**
Max Temperature	**Up to 1300–1450°C depending on system design**
Density	**Approx. 2.8–3.1 g/cm³**
Customization	**Custom tube size, length, layout, and assembly design available**

APPLICATIONS

Heat Exchangers · Chemical Processing · Furnace Heat Recovery · Corrosive Media Handling · Gas Heating Systems · Thermal Process Equipment · Industrial Heat Transfer Duty

KEY FEATURES

1. Provides efficient heat transfer in high-temperature gas and liquid process systems.
2. Good corrosion resistance supports reliable service in aggressive chemical environments.
3. High thermal conductivity helps improve exchange efficiency and reduce thermal loss.
4. Suitable for heat recovery, process heating, and heat exchange systems requiring long-term stability.

Silicon Carbide Heat Exchanger Tube Size:

Type1- Calculation of sic heat exchanger tube area (m^2) and length with an outer dia of 14mm

Item No.	Heat Exchanger Mold	Quantities of Heat Exchanger	L=3000mm	L=2500mm	L=2000mm	L=1500mm	L=1000mm
AT-THG-HRQ001	DN100	7	0.92	0.77	0.62	0.46	0.31
AT-THG-HRQ002	DN150	0.1	0.15	0.2	0.2	0.3	0.15
AT-THG-HRQ003	DN200	31	4.09	3.41	2.73	2.05	1.36
AT-THG-HRQ004	DN250	0.1	0.15	0.2	0.2	0.3	0.15
AT-THG-HRQ005	DN300	76	10.03	8.36	6.69	5.01	3.34
AT-THG-HRQ006	DN350	0.1	0.15	0.2	0.2	0.3	0.15
AT-THG-HRQ007	DN400	140	18.47	15.39	12.32	9.24	6.16
AT-THG-HRQ008	DN450	0.1	0.15	0.2	0.2	0.3	0.15
AT-THG-HRQ009	DN500	230	30.35	25.29	20.23	15.17	10.12
AT-THG-HRQ010	DN600	0.1	0.15	0.2	0.2	0.3	0.15
AT-THG-HRQ011	DN700	454	59.90	49.92	39.94	29.95	19.97
AT-THG-HRQ012	DN800	0.1	0.15	0.2	0.2	0.3	0.15
AT-THG-HRQ013	DN900	769	101.47	84.56	67.64	50.73	33.82
AT-THG-HRQ014	DN1000	0.1	0.15	0.2	0.2	0.3	0.15
AT-THG-HRQ015	DN1200	1393	183.80	153.17	122.53	91.90	61.27

Silicon Carbide Heat Exchanger Tube Size:

Type2- Calculation of sic heat exchanger tube area (m^2) and length with an outer dia of 19mm

Item No.	Heat Exchanger Mold	Quantities of Heat Exchanger	L=3000mm	L=2500mm	L=2000mm	L=1500mm	L=1000mm
AT-THG-HRQ0016	DN100	7	1.25	1.04	0.84	0.63	0.42
AT-THG-HRQ0017	DN150	13	2.33	1.94	1.55	1.16	0.78
AT-THG-HRQ0018	DN200	22	3.94	3.28	2.63	1.97	1.31
AT-THG-HRQ0019	DN250	38	6.80	5.67	4.54	3.40	2.27
AT-THG-HRQ0020	DN300	55	9.85	8.21	6.57	4.92	3.28
AT-THG-HRQ0021	DN350	73	13.07	10.89	8.71	6.54	4.36
AT-THG-HRQ0022	DN400	96	17.19	14.33	11.46	8.60	5.73
AT-THG-HRQ0023	DN450	126	22.56	18.80	15.04	11.28	7.52
AT-THG-HRQ0024	DN500	151	27.04	22.53	18.03	13.52	9.01
AT-THG-HRQ0025	DN600	230	41.19	34.32	27.46	20.59	13.73
AT-THG-HRQ0026	DN700	316	56.59	47.16	37.72	28.29	18.86
AT-THG-HRQ0027	DN800	421	75.39	62.82	50.26	37.69	25.13
AT-THG-HRQ0028	DN900	526	74.19	78.49	62.79	47.10	31.40
AT-THG-HRQ0029	DN1000	649	116.22	96.85	77.48	58.11	38.74
AT-THG-HRQ0030	DN1200	955	171.01	142.51	114.01	85.51	57.00

Customize Silicon Carbide Heat Exchanger Tube

For industrial buyers, the real decision is not only size. It is whether geometry, resistance behavior and atmosphere adaptation are tuned to the process.

85%	3 pcs	3-5 days	±0.01 mm
Projects are custom orders	Minimum order quantity	Simple modifications	Achievable diameter tolerance

Customization scope that matters to industrial buyers

- Channel geometry can be adjusted for thermal duty and flow stability targets.
- Seal interfaces can be refined for leak control under thermal cycling.
- Nozzle connections and support structures can be matched to the plant layout.
- Instrumentation points can be added for pressure, temperature and maintenance checks.

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 Heat Exchanger Tube Applications

The following application examples are representative outcomes reported by ADCERAX for specific operating conditions.

	Typical buyer pain	Reported result	Reported result	Reported result
Bromine / HBr condensation	Graphite units needed replacement every 4-6 months, with high shutdown cost and purity risk.	>24 months service life reported in the upgraded line.	About 30% fewer off-spec batches through tighter temperature stability.	>50% fewer maintenance interventions over two years.
HCl pickling lines	Metal exchangers failed in 3-5 months, while graphite units clogged and forced repeated stoppages.	12 months of uninterrupted operation with scheduled flushing only.	Cleaning frequency reduced by about 50%.	>40% lower heat-exchanger-related downtime in year one.
Furnace flue-gas recovery	Plate exchangers cracked after 200-400 cycles and heat-recovery efficiency dropped as leakage increased.	>1,000 operating cycles without reported structural failure.	Fuel consumption dropped about 6-9% for the same output.	Inspection interval extended from semi-annual to annual.

Silicon Carbide Heat Exchanger Tube Usage Guide

Installation Setup

- Site Check : Check inlet, outlet, and support alignment before installation.
- Seal Check: Inspect seals and gaskets for cracks or damage.
- Pre-Start Check: Verify joints, insulation, and structure before start-up.

Start-Up Control

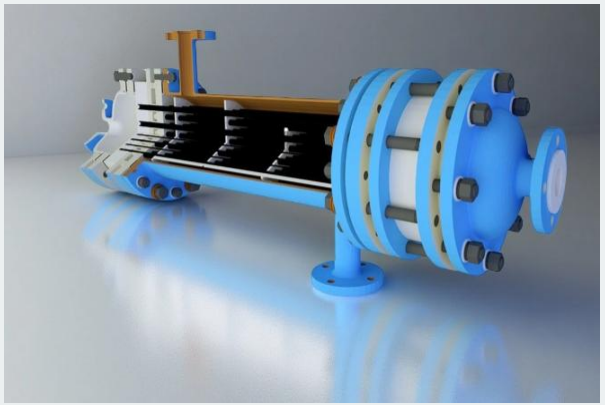
- Gradual Heating: Heat slowly to reduce thermal shock.
- Flow Check: Confirm stable air and gas flow before full load.
- Start-Up Review: Check temperature, pressure, and flow for stability.

Cleaning and Inspection

- Regular Cleaning: Clean channels regularly to prevent build-up.
- Surface Check: Inspect for scaling, pitting, or roughness changes.
- Wear Monitoring: Monitor bends and inlet zones for early wear.

Long-Term Maintenance

- Seal Replacement: Replace seals at planned intervals.
- Structural Check: Inspect housing, supports, and insulation regularly.
- Data Review: Track operating data to support maintenance planning.



Technical Support

Technical Inquiry: info@adcerax.com

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Silicon Carbide Heat Exchanger Tube FAQ

- **Q: How do Silicon Carbide Heat Exchanger Tubes stay stable in bromine, HCl, HF, or mixed-acid service?**
  A: Dense SSiC with porosity below 0.1% limits acid penetration and improves corrosion resistance. This helps reduce shutdowns and supports longer maintenance intervals in halogen- and acid-based processes..

- **Q: Why are Silicon Carbide Heat Exchanger Tubes effective in high-velocity, particle-rich circuits?**
  A: With hardness above 2500 HV10, the tubes resist erosive wear from scale and solids. This helps maintain channel shape, heat-transfer efficiency, and service life under fast flow conditions.

- **Q: How do Silicon Carbide Heat Exchanger Tubes handle rapid thermal cycling?**
  A: Their bonded SiC channel design offers thermal-shock resistance of $\Delta T \geq 250°C$. This helps reduce cracking and seal failure during frequent temperature changes.

- **Q: What makes these tubes suitable for high-pressure industrial circuits?**
  A: Flexural strength above 350 MPa and compressive strength over 2200 MPa help the tubes resist deformation under pressure. Their rigid structure also reduces vibration-related failure.

- **Q: How do Silicon Carbide Heat Exchanger Tubes prevent leakage in dual-channel systems?**
  A: Reinforced ceramic seals and a stable bonding design help prevent channel crossover. This supports leak-free operation in hot, acidic, and vibration-prone environments.

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.

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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