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SICABON[®] silicon carbide shell and tube heat exchanger

Silicon carbide (SiC) shell and tube heat exchangers are a perfect solution, if other materials like graphite reach their limits.

SICABON heat exchangers provide highest corrosion resistance for all ultra demanding applications. Our proven technology is based on more than 25 years of experience and hundreds of installations all over the world.

SICABON heat exchanger differs from most other designs on market significantly due to the sealing technology of the tubes into the tube sheet. This SGL Group's patented sealing system including special developed gaskets ensures highest reliability available on market. Our innovative CARBOGUARD[®] carbon fiber reinforcement technology of tubes is a unique optional feature and provides additional safety against high stress conditions like temperature or pressure shocks.

Customer benefits

- **Extreme corrosion resistance:** meets extreme demands for corrosion resistance, e.g. mixed corrosive media with differing and varying corrosive constituents
- **High plant availability:** sturdy tube sheet plates (e.g. thick metal core) and a uniform and constant tube sealing for all tubes ensure highest reliability against leakages
- **Unique safety:** CARBOGUARD, our carbon fiber reinforcement of SiC tubes is unique on market to give additional safety against tube breakages under high stress conditions
- **Compactness:** up to 70 % less heat exchange area vs. e.g. glass equipment by very efficient directly sintered silicon carbide tubes
- **Low maintenance costs:** easy removal of headers for direct access e.g. cleaning or inspection on tube side
- **Cleanness:** no risk of contamination/interaction of process media, e.g. ultra pure application for semiconductor or pharmaceuticals incl. GMP/FDA
- **Flexibility:** large range of design options to allow optimized solutions
- **Service excellence:** fast and competent services for repairs and spare parts



↑ SICABON tubesheet lined with PFA

Example applications

- **Heat exchange of ultra-corrosive applications** e.g. highly concentrated sulphuric acid, nitric acid, hydrofluoric acid, pickling liquors, caustic soda, etc.
- **Functions:** heating, cooling, condensation, heat recovery by interchanger

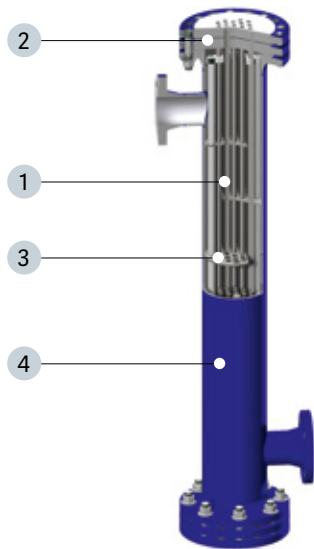
Product information

- **Heat exchange area:** from 0.2 m² up to 34 m²
- **Base design:** SiC tubes sealed into a clamped tube sheet and mounted into a steel shell
- **Special designs:** e.g. double gasket, double tube sheet with safety chamber, screwed design
- **Special features:** CARBOGUARD carbon fiber reinforcement of tubes for increased safety against tube breakages

Data of SICABON® silicon carbide shell and tube heat exchanger

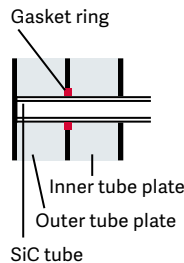
Technical specification	Units	SICABON silicon carbide shell and tube heat exchanger
Main application		ultra-corrosive and/or high purity applications
Gasket materials		FFKM, FKM, FEPM
Tube sheet materials		PFA lined steel or others
Tube material		directly sintered silicon carbide (SiC)
Tube diameter/wall thickness	mm	14 x 1.5 or 19 x 2.2
Tube length	mm	1000 to 4500
Standard design temperature*	°C	(-30) 0 / 180 (220)
Standard design pressure*	barg	-1/8 (10)
Max. heat exchange area	m ²	0.2 up to 34
Shell diameter	mm	100 to 400
Standard connections		DIN/ANSI
Special design features		CARBOGUARD – carbon fiber reinforcement for 19 mm tubes; safety chamber
Shell/header materials		carbon steel, stainless steel, PTFE lined steel, glass lined steel
Standard painting		sandblasting according to SA 2 ½, DIN 12944-4 one base coat with 1-component epoxy-zinc primer; dry film thickness 40 µm
Available pressure codes		PED/AD2000-Merkblatt – partial for steel parts acc. ASME (U-stamp)

* values in brackets on special request

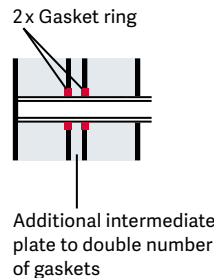


- 1 Silicon carbide tubes
- 2 PFA lined tubesheet
- 3 Baffles made of PTFE or steel
- 4 Steel shell

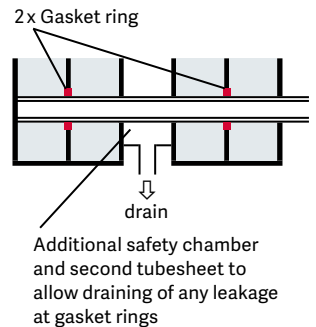
Single gasket



Double gasket
(increased safety against leakage)



Double tubesheet with safety chamber
(for ultra demanding applications)



↑ SICABON shell and tube heat exchanger (without headers)

↑ Tubesheet design options (schematic)

TIS SHX.00

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The data contained herein represent the current state of our product knowledge and are intended to provide general information on our products and their application spectra. In view of the variety and large number of application possibilities, these data should be regarded merely as general information that gives no guarantee of any specific properties and/or suitability of those products for any particular application. Consequently, when ordering a product, please contact us for specific information on the properties required for the application concerned. On request, our technical service will supply a profile of characteristics for your specific application requirements without delay.

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