

ESK's plate heat exchanger is made of sintered silicon carbide advanced ceramic to resist extremely corrosive media and particle-loaded erosive liquids.



Heat Exchanger Plates of EKasic® Silicon Carbide

Properties

EKasic® silicon carbide plate heat exchangers are used in the chemical industry or similar sectors, especially where critical media are heated and cooled, or must be evaporated and condensed. The EKasic[®] silicon carbide plates resist acids, alkalis and hot water. EKasic[®] SiC is also extremely hard and wear resistant. It does not release either particles or metal ions.

The material is approved for drinking water applications according to KTW, WRAS and Fresenius, and is also harmless for food-contact applications. Together with the excellent thermal shock resistance of EKasic® silicon carbide, ESK plate heat exchanger have long service lives, high safety and improved product quality, even at temperatures up to 850 °C.

The plate heat exchanger with the patented ESK design operates on the counterflow principle. The ESK plate design was specially tailored for liquid media by means of computational fluid dynamics (CFD) simulations. It is capable of outstanding heat transfer rates with minimum pressure loss. The outstanding thermal conductivity of the very lightweight EKasic® SiC permits very high thermal efficiency. The dimensions and weight of the EKasic® silicon carbide plate heat exchangers can be kept amazingly small, making the apparatus extremely compact.

Either DIN or ANSI flanges can be used for connection. The B260 and B500 series products were designed especially for heat transfer between liquids with a pressure difference of up to 16 bar.

Compact plate heat exchangers can transfer up to 350 kW with an extremely small footprint.

Individual design of the heat exchangers is carried out with the internationally recognized HTFS software.





Corrosion resistance of EKasic® silicon carbide ∎ 120°C Medium ■ 220°C dist. H.O 96% H.SO. 65% HNO₃ 32% HCI 50% HF 1.1 HE/HNO 30% NaOH 30% KOH 10 100 1000 0.0001 0.001 0.01 0.1 1 Material loss [mm/year]

Processing

ESK plate heat exchangers meet demands for robust design, customized performance and ease of maintenance. They operate without gaskets as a hermetically sealed monolithic block. This design provides high reliability for use with highly dangerous substances. All designs can work with pressure differences up to 16 bar. Risk of fouling is extremely low. EKasic® silicon carbide plate heat exchangers also make thing easy when cleaning-in-place is necessary. Complete drainage for maintenance and cleaning is possible at any time without dismantling.

Advantages

- EKasic[®] SiC is a general-purpose material with a prolonged service life even in the most corrosive of media
- High wear resistance significantly increases product quality
- ESK plate design: low pressure loss, high thermal efficiency and low fouling
- Compact, lightweight apparatus for tight spaces and easy installation
- Pressure difference up to 16 bar
- Minimum-gasket design for extremely high safety

Applications

- Liquid-liquid heat exchange of aggressive chemicals
- Seawater applications
- Geothermal applications
- Temperatures up to 850 °C
- Cryogenic temperatures

Possible Fields of Application

- Chemical industry
- Steel industry
- Ore extraction
- Paper making
- Pharmaceutical industry
- Fertilizers
- Flue-gas purification
- Semiconductor industry
- Power engineering

Special Designs

ESK plate heat exchangers are also available in special designs for extremely challenging applications. They can also be adapted for multistage operation or for high throughputs at one side.

On request, heat exchanger components of EKasic[®] silicon carbide can be customized to special requirements. We will be pleased to provide no-obligation advice.

The data presented in this leaflet are in accordance with the present state of our knowledge, but do not absolve the user from carefully checking all supplies immediately on receipt. We reserve the right to alter product constants within the scope of technical progress or new developments. The recommendations made in this leaflet should be checked by preliminary trials because of conditions during processing over which we have no control, especially where other companies' raw materials are also being used. The recommendations do not absolve the user from the obligation of investigating the possibility of infringement of third parties' rights and, if necessary, clarifying the position. Recommendations for use do not constitute a warranty, either express or implied, of the fitness or suitability of the products for a particular purpose. The management system has been certified according to DIN EN ISO 9001, DIN EN ISO 14001. EKasic[®] is a registered trademark of ESK Ceramics GmbH & Co. KG

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