

## Pharmaceutical and Sanitary Heat Exchangers

**P- LINE and S-LINE** - a new series of exchangers for pharmaceutical and food industries and suitable for all other applications that are in compliance with FDA and 3A.

The unique construction of P-LINE and S-LINE series exchangers prevents cross-contamination of the media even in the case of unsealing of the tubesheet-tube connections; it also ensures correct operation in applications requiring the highest standards of cleanliness.

### INDUSTRIES:

- pharmaceutical,
- biotech,
- food processing,
- beverage production,
- dairy,
- cosmetics, fragrances,
- semiconductor.
- high purity.

### APPLICATIONS:

Food & dairy industry:

- juice and syrup handling,
- chocolate and high viscosity products handling,
- brewery,
- milk cooling,
- pasteurization.

Pharmaceutical:

- clean steam,
- blood , plasma or media growth heating systems,
- water for injection systems (WFI),
- process equipment.

### GENERAL DATA:

Design pressure:                   - tube side: 1.0 MPa,  
                                              - shell side: 1.6 MPa.

Design temperature:  
- tube side:                         -17°C /140 °C (Viton seal),  
                                              -25°C /121 °C (Silicon seal),  
- shell side:                         -25°C /203 °C.

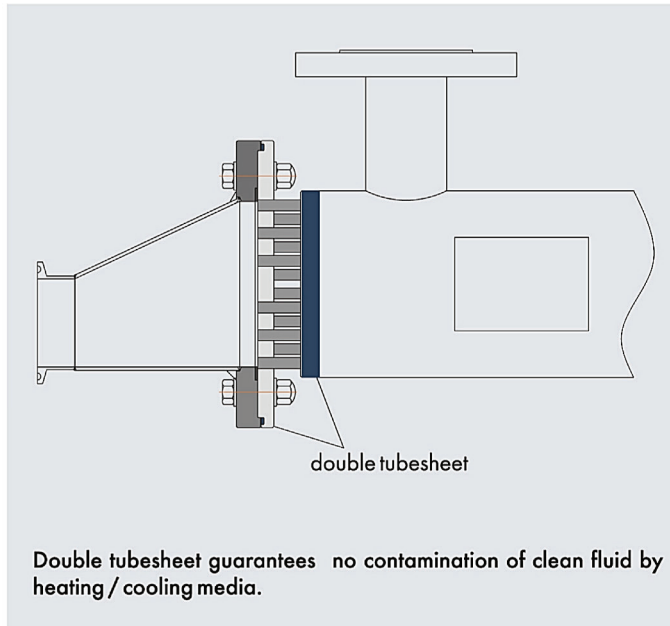
Surface roughness of the clean side:

- P type exchanger:  $Ra \leq 0.5 \mu m$ ,
- S type exchanger:  $Ra \leq 0.8 \mu m$ .



## CHARACTERISTICS:

- full compliance with FDA, cGMP and 3A requirements,
- construction made of 316 stainless steel or titanium,
- system of complete separation of the media, even in the case of unsealing at the tubesheet,
- dismantlable construction without dead spots, minimizing the possibility of microbial growth,
- all surfaces in contact with the clean medium polished to  $Ra < 0.5 \mu m$  or  $Ra < 0.8 \mu m$ ,
- certificated seamless tubes of the exchanger, polished internally and externally,
- certified seals for clean applications,
- one-, two- or four-pass types, depending on the requirements of thermodynamics,
- both vertical and horizontal mounting available.



## CONNECTIONS:

- connections on the tube side - "tri-clamp" type sanitary connectors in accordance with DIN 32676,
- possible sanitary clamps acc. to ASME BPE or SMS 3017,
- connections on the shell side - flat flange according to EN 1092-1,
- connections according to ASME B16.5 on request.

## GASKETS:

- 3-A approved Viton and Silicone sterile side gaskets, in accordance with FDA requirements,
- gaskets not in contact with clean fluid made from EPDM or NBR.



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