



Tetra Pak[®] Tubular Heat Exchanger S



Introduction

The Tetra Pak[®] Tubular Heat Exchanger S is a single-pass shell-and-tube heat exchanger. The fluid to be heat treated flows through a group of parallel, small diameter inner tubes with the medium (water, steam or glycol) flowing between and around these. The inner tubes are corrugated for increased turbulence and heat transfer.

Benefits

- Robust, reliable and durable
- Hygienic design
- Compact and easy to install

Applications

- Indirect, in-line heating or cooling of water
- CIP solutions
- Process water or food product

Features

The unit has a reliable, durable, safe and hygienic design. The small size makes it easy to install.

The heat transfer surface consists of a group of straight inner tubes welded into a tube case at each end. O-rings seal the tube cases from the shell. This design with floating, not fixed or welded, parts absorbs thermal expansion and eliminates the risk of cracking and stress corrosion. It also allows for easy inspection and maintenance.

The heat exchanger is available in five sizes (S0 to S4). The standard design fulfils the requirements of the majority of our customers. The unit can also be customized and is available in a variety of heavy duty designs.

The unit can be installed horizontally or vertically, in a frame or on a wall if there's a shortage of floor space. Vertical mounting is recommended when steam is used as heating medium.

Standard design

Material

- **Shell:** Pressure vessel steel, 1.4404 (AISI 316 L)
- **Tube insert:** Pressure vessel steel, 1.4404 (AISI 316 L), corrugated

Connections

- **Shell side**
 - » **Inlet:** flange PN16 [E]*
 - » **Outlet:** socket BSP [F]
- **Tube insert side:** Flange with welding end [G]
- **Shell side for other designs:**
 - » **Inlet:** flange PN16 [E]*
 - » **Outlet:** socket BSP or flange PN16 [F]

Approval

Approved for below specified temperature and pressure range according to the European pressure equipment directive – PED 2014/68/EU, category I.

- Optional flanges are suitable for standards of EN1092-1 as well as ANSI
- **Max design pressure:** See tables

Design temperature: 180 °C (356 °F).

| Max design pressure | S0 | S1 | S2 | S3 | S4 | S4 |
|---------------------|----|----|----|------|----|----|
| Tube insert (bar) | 50 | 32 | 23 | 16.9 | 11 | 32 |
| Shell (bar) | 16 | 16 | 9 | 8 | 6 | 8 |
| Category | I | I | I | I | I | II |

Capacity

| Temperature (in/out) | S0 | S1 | S2 | S3 | S4 |
|----------------------|--------|--------|--------|--------|---------|
| 50 °C/ 70 °C | 20 100 | 30 300 | 42 500 | 54 200 | 100 000 |
| 60 °C/ 80 °C | 15 500 | 23 600 | 31 900 | 42 000 | 91 800 |
| 70 °C/ 90 °C | 11 400 | 16 600 | 23 100 | 28 600 | 71 000 |

Max flow rate in kg/h for pre-defined temperature intervals at 300 kPa steam pressure (absolute) and 15 % margin.

Optional Equipment

- Tube pusher
- Counter flange(s) for flange PN16
- Insulation

Other designs and option

Connections

Tube insert side [G]: Eccentric reducer with welding end.
Shell side for the standard design [E+F]:

| | S0 | S1 | S2 | S3 | S4 |
|-----------------------|------|------|-------|-------|-------|
| Clamp - ISO 2852 (mm) | 63.5 | 76 | 104 | 104 | 104 |
| Flange PN 16* | | | | | |
| DIN | DN65 | DN65 | DN100 | DN100 | DN100 |
| ANSI (inches) | 3 | 3 | 4 | 4 | 4 |

Heavy duty design

Approval according to PED 2014/68/EU, category II.
Design temperature: 210 °C (410 °F).

| Max design pressure | S0 HD | S1 HD | S2 HD | S3 HD | S4 HD |
|---------------------|-------|-------|-------|-------|-------|
| Tube insert (bar) | 40 | 40 | 40 | 32 | 32 |
| Shell (bar) | 16 | 15 | 14 | 14 | 14 |

Approval according to MHLW

Design temperature: 160 °C (320 °F)

| Max design pressure | S0 | S1 | S2 |
|---------------------|----|----|----|
| Tube insert (bar) | 30 | 22 | 20 |
| Shell (bar) | 12 | 12 | 10 |

* The dimension of the flanges means that a counter flange fits from both:

DN65: PN16 EN1092-1 and ASME/ANSI B16.5 NPS3 Class150
DN100: PN16 EN1092-1 and ASME/ANSI B16.5 NPS4 Class150

Unit data

| | S0 | S1 | S2 | S3 | S4 |
|--------------------------------------|-----|-----|------|------|------|
| Shell | | | | | |
| Diameter (mm) | 85 | 108 | 129 | 153 | 153 |
| Volume (l) | 5.5 | 9.3 | 13.5 | 28.8 | 28.8 |
| Nr. of inner tubes | | | | | |
| Diameter (mm) | 16 | 16 | 16 | 16 | 16 |
| Volume (l) | 3.8 | 6.1 | 8.6 | 11.8 | 17.8 |
| Heat transfer Area (m ²) | 1.1 | 1.7 | 2.4 | 3.3 | 5.1 |
| Weight (Kg) | 32 | 43 | 58 | 72 | 78 |

Measurements

| | S0 | S1 | S2 | S3 | S4 |
|---------------|--------|----------|----------|-------|-------|
| A (mm) | 1 720 | 1 720 | 1 700 | 1 700 | 2 700 |
| B (mm) | 2 028 | 2 034 | 2 038 | 2 038 | 3 038 |
| C (mm) | 102 | 114 | 124 | 137 | 137 |
| D (mm) | 80 | 92 | 102 | 115 | 115 |
| E | | | | | |
| DIN | DN65 | DN65 | DN100 | DN100 | DN100 |
| ANSI (inches) | 3 | 3 | 4 | 4 | 4 |
| F (inches) | 2 | 2 | 2 | 2 | 2 |
| G (mm) | 51x1.5 | 63.5x1.6 | 76.1x1.6 | 104x2 | 104x2 |
| H (mm) | 154 | 157 | 169 | 169 | 169 |

The measurements refer to the standard design.

Information requested for quotation

- Fluid to be heat treated
- Required flow rate
- Inlet and outlet temperatures for the processed fluid
- Medium (e.g. water, steam, glycol)
- Properties of the medium (temperature or steam pressure)
- Final customer country

Environment

The amount of energy consumed is depending on the duty the specific heat exchanger is performing. Utility consumption and heat recovery are optimised for each specific case. All Tetra Pak Tubular Heat Exchangers consist of parts that can be separated for recycling purposes.

