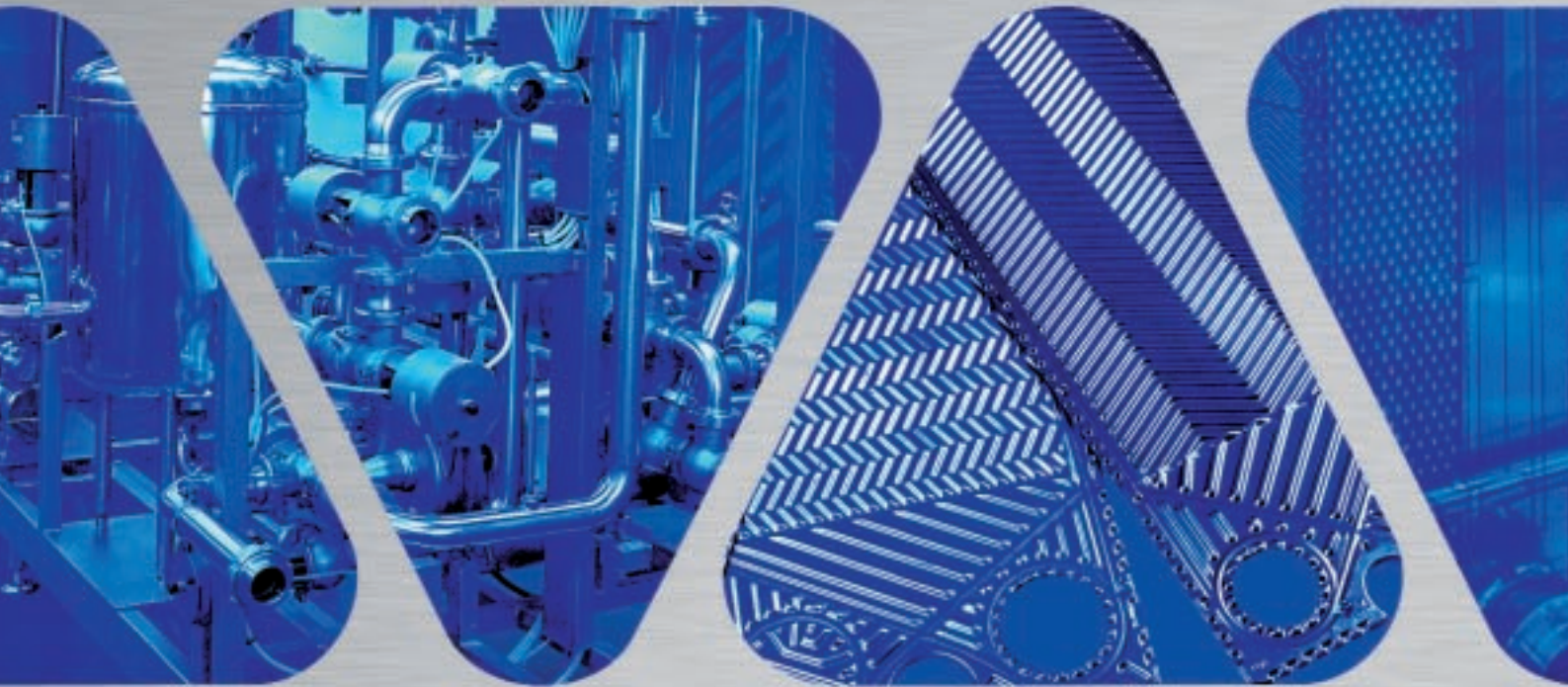




dismountable plate heat exchangers







## Introduction:

One of the primary goals of the joint-stock company TENEZ is a satisfied customer. In our activities we apply both the custom-type manner of the production of devices and process equipment and batch production. The production and technical order processing is implemented in accordance to requests and needs of our customers. We are doing our best to establish as close contact with customers as possible with respect to incessant improvement of quality of our products and services. We put great stress on after-sale services such as servicing, consultancy activities, sale of spare parts and those activities are integral part of our company strategy. TENEZ a.s. has been awarded the certificate ISO 9001.

The company TENEZ a.s. was established in the year 1992. In its activity the company develops an almost fifty-year tradition of production and supply of stainless equipment from Chotěbořské strojírný.

By utilising high expertise and flexibility of our engineers and blue-collar workers the technical solutions are implemented on the highest level. In the area of realisation of our intentions it represents high requirements as regards the production of equipment. We use our own engineering, designing, manufacturing and assembling departments for fulfilling our aims.

In the beginning of nineties, TENEZ a.s. company in co-operation with its foreign partner, the company API Schmidt-Bretten, has completed the development of the welded stainless plate heat exchangers of ST type. Its great properties, high corrosion resistance, high intensity of heat transfer and possibility of high operation temperatures and pressures, are destined to be used in the most exacting heat transfer processes, for instance in the chemical and pharmaceutical industry. The company has registered patents on the type designs as well as the technological procedure of welding of the heat exchangers in the European Union and the United States.

Apart from the welded stainless plate heat exchangers, the part of our production programme is also the production of the plate dismountable heat exchangers which find their wide application in the food processing industry.

TENEZ a.s. company is a manufacturer and renowned supplier of the complete milk plants, parts of breweries, and the plants for the production of non-alcoholic beverages. The equipment produced in the company can be applied not only in the food processing plants, but also in the process equipment units for the chemical and pharmaceutical industry and power-plant engineering.

In addition to the piece production, the company provides for the complex solution of supply-investment activities. Higher supplying functions facilitate to ensure the design solutions as regards the individual designs of new equipment and modernisation as well as the complex solutions for new plants.

Export is a significant and substantial part of our turnover and represents more than 49% of the company production.

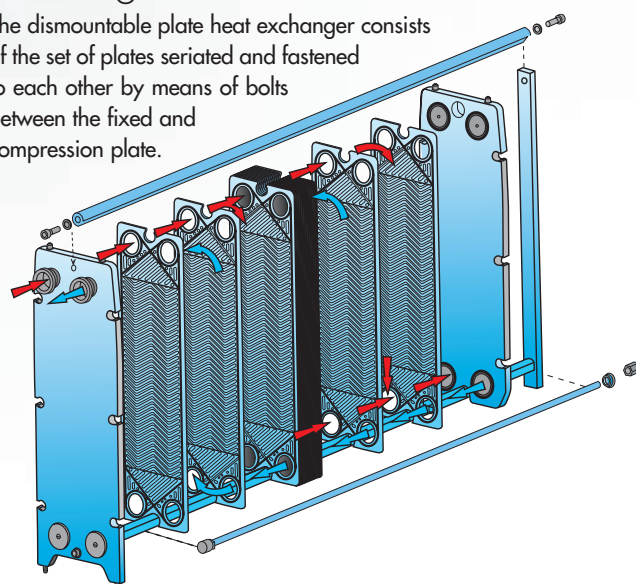
Therefore, we are supplying our products to customers in Germany, Austria, the Netherlands, Sweden, France, England, Slovakia, Poland, Russia, where the company has its business agency office, and also to Israel, Kuwait, Egypt, Japan, Argentine and the USA.

The quality of our products corresponds to the European and world standards. The company has acquired the necessary permissions for the production and export of pressure tanks according to the German TÜV a AD Merkblatt regulations, Austrian Ö-NORM standards, Polish UDT regulations, Slovakian ITI regulations and Russian GOST regulations. Our company is preparing also the certification in compliance with ASME Code for supplies in the American markets.

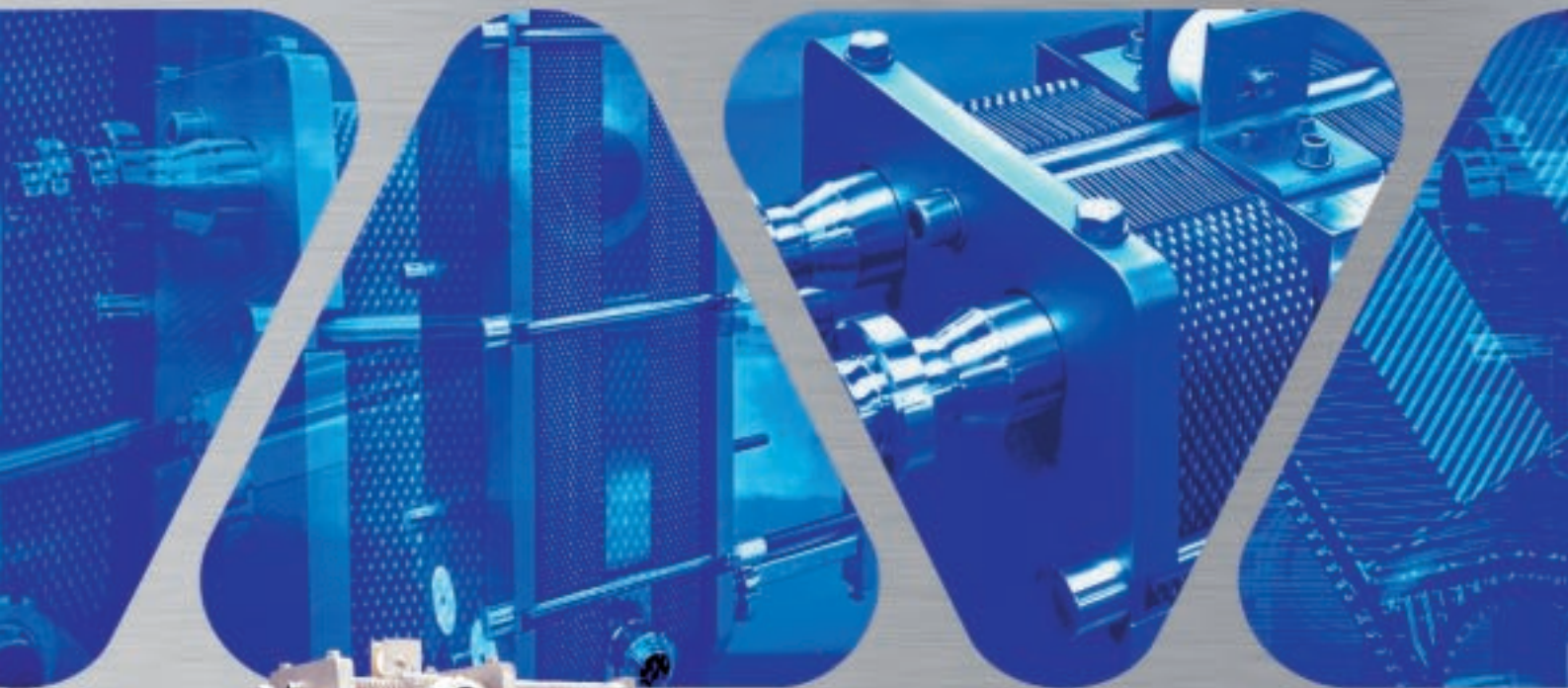
## Dismountable Plate Exchangers

Principle of the dismountable plate exchanger:

The dismountable plate heat exchanger consists of the set of plates seriated and fastened to each other by means of bolts between the fixed and compression plate.







pen drawing of the principle

Each plate is equipped with sealing, by which the system of separated drains for through-flow of primary and secondary media is created. The plates are moulded so that an intensive turbulence occurred in the flowing medium, by which the heat transfer is increased. It can be stated that the plate heat exchangers have three times higher efficiency than the pipe exchangers.

## Plates:

The plates SIGMA, as basic construction elements, essentially contribute to obtaining the excellent thermodynamic properties of the exchangers TENEZ.

The operation surface of the plates is polished, which together with highly turbulent flowing causes a minimal deposition of sediments and contamination.

The passages of media in the set of plates depend on thermodynamic requirements for the exchanger. In order to meet the requirements of our customers and operation conditions of the process equipment, the plates SIGMA with several versions of moulding are used. By combining variously perforated plates and variation of their sizes with parallel or serial arrangement of inter-plate drains the optimum parameters of the equipment operation is achieved.

## Production materials:

composition and temperature of media at the heat exchange determine the material of which the plates are manufactured

high-grade steel 1.4401, 1.4539, 1.4571

Titan 3.7025, 3.7225

SMO 254

Alloy C 276



hard

soft

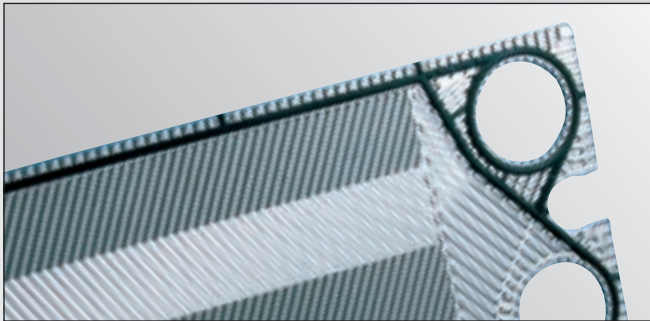
zig-zag

## Sealing materials:

When utilising the exchangers with sealing, it is necessary to comply with certain rules in dependence on temperature and the type of the used medium. Constant exceeding the temperature makes the sealing deteriorate more rapidly.

## Sealing materials:

Sealing type	Max. temperature	Application
NBR	140 °C	oil, water, food processing industry
EPDM	160 °C	hot water, acids, food processing industry



Viton	180 °C	aggressive chemicals, oils, fats
AFM	190 °C	oils
PTFE	260 °C	aggressive chemicals

Sealing is fastened by gluing with special glues, or by the mechanical system of fastening.

### Support stands:

The support stands of exchangers are constructed for various operation pressures from 6 to 25 bar. Surface finish of the all-stainless support stands is performed by polishing or with ballottini, or at the support stands made of carbon steel by the protective paint RAL 5010.

### Accessories:

According to the needs of the plant process equipment, and the requirements and standards of EU, the exchangers can be equipped with the following accessories:

tanks, deodorising devices, hot-water circuits, steam mixing devices, pumps, fixtures, endurance tanks, test cocks etc.

### Control:

The level of control is supplied according to the requirements of customers: the hand operation with compulsory regulation of pasteurising temperature, the semi-automatic by means of remote valves, or the complete control by means of the automatic machine (Mitsubishi, Omron, Siemens, Allen Bradley).

### Connection:

According to DIN 11851, Clamp, flange connection, or possibly by pipe thread.

### Cleaning and maintenance:

The great advantage of the exchangers of this design is their dismantability.

Cleaning can be performed in chemical manner by through-flow of the chemical agents or mechanically; in case of sealing damage its replacement is possible.

### Main fields of application

- food processing industry
- pasteurisers for milk and cream
- pasteurisers of viscous food media – egg contents, kefir, ketchup, milk creams, spread butter, fruit products, etc.
- pasteurisers of beer and saturated fruit beverage by CO<sub>2</sub>
- heaters
- coolers
- exchangers for heat recuperation from sewage water

### Individual approach towards customers:

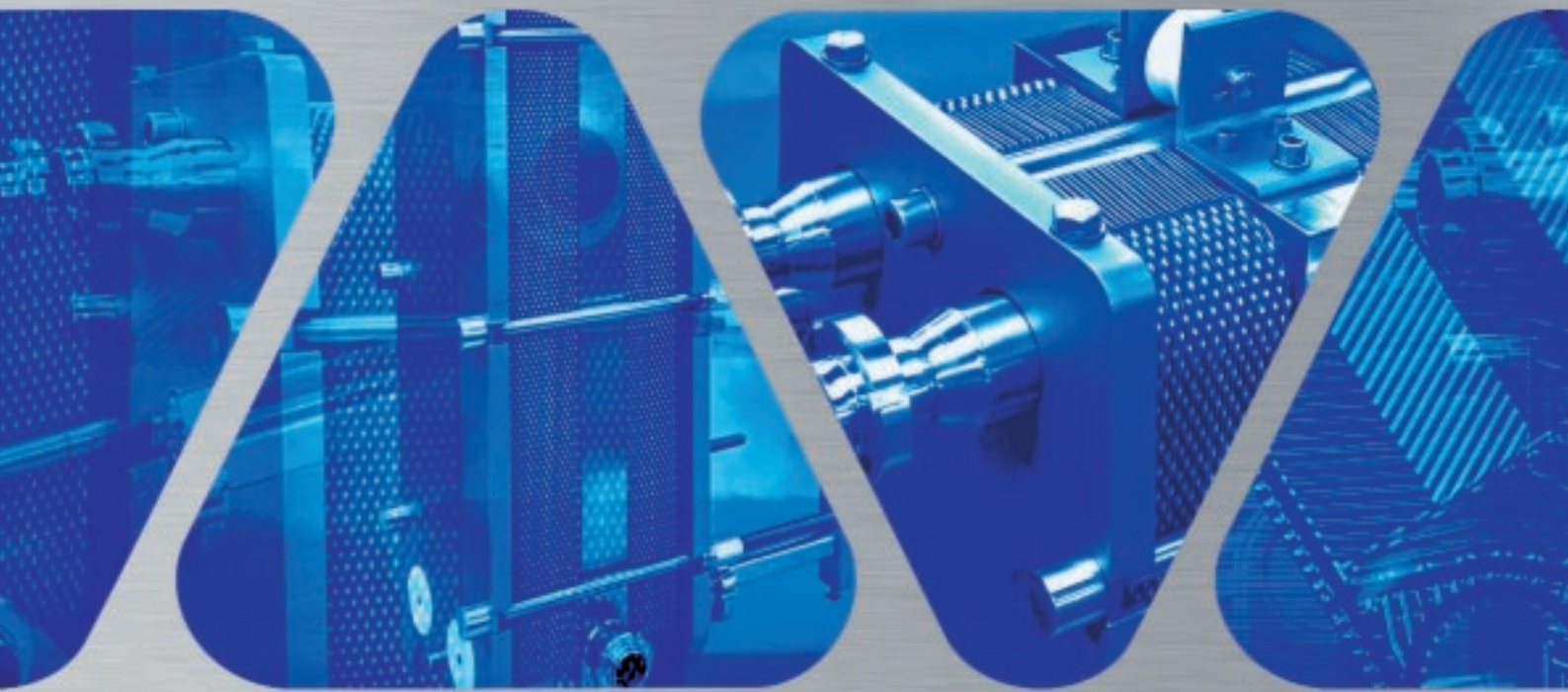
For the calculation of the type of exchanger for a given application, TENEZ a.s. company utilises the official software.

In case of request for the exchanger design for a given application we should be pleased to send you by return the calculation that is made with high precision by means of computer programmes based on careful and solid thermodynamic and hydrodynamic measurements.

The bases for the calculation are the following parameters:

- operation temperature mode
- through-flow rate or amount of heat transferred
- operation pressure mode, possible reductions of admissible pressure losses
- through-flowing media or their physical properties





## Technical parameters

### Parameters of the plates SIGMA

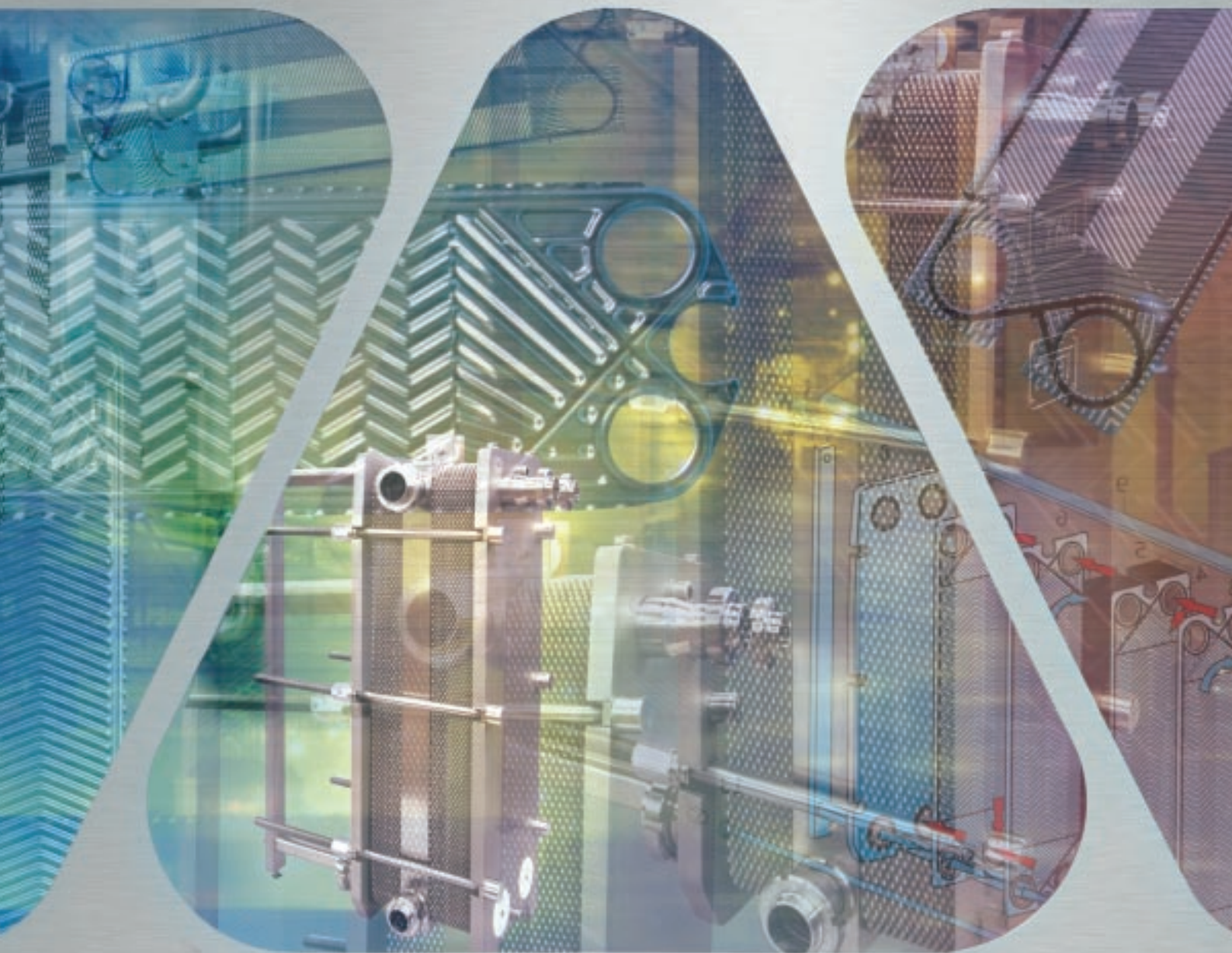
	<b>Sigma SI 7</b>	<b>Sigma SI 9</b>	<b>Sigma SI 17</b>	<b>Sigma SI 27</b>	<b>Sigma SI 37</b>	<b>Sigma SI 66</b>
Operational surface of the plate m <sup>2</sup>	0.056	0.092	0.133	0.245	0.345	0.655
Dimensions of the plate mm h x w	570x156	794x156	979x196	1116x304	1230x364	1677x498
Thickness of the plate according to an application mm	0.5/0.6/0.7/0.8/1.0					

### Technical parameters and the use of the plates for pasteurisers

	<b>Milk pasteurisers</b>	<b>Viscous media pasteurisers</b>	<b>Beer and saturated beverage pasteurisers</b>
Types of plates			
Sigma SI 7	yes	no	no
Sigma SI 9	yes	no	yes
Sigma SI 17	yes	yes	yes
Sigma SI 27	yes	yes	yes
Sigma SI 37	yes	yes	yes
Sigma SI 66	yes	yes	yes
Material of the plates	1.4404, 1.4571, Titan	1.4404, 1.4571, Titan	1.4404, 1.4571, Titan
Thickness of the plates mm	0,6 - 0,8	0,6 - 1	0,6 - 1
Design of the support stand	stainless	stainless	stainless
Sealing material	NBR, EPDM,	NBR, EPDM	NBR, EPDM
Output - flow rate l/h	200 - 40 000	500 - 15 000	1250 - 40 000
Working pressure	up to 10 bar	up to 16 bar	up to 16 bar
Working temperature for pasteurisation	up to 110 °C	up to 110 °C	up to 110 °C
Working temperature for sterilisation	up to 130 °C	up to 130 °C	up to 130 °C
Design according to the standard EEC 92/46	yes	yes	yes
Achieved regeneration	92%	92%	92%

### Technical parameters and the use of the plates for heaters and coolers

	<b>Heaters</b>	<b>Coolers</b>
Specification of media	the food processing media, see the chart of pasteurisers the chemical media, sewage water	the food processing media, see the chart of pasteurisers the chemical media, sewage water
Types of plates		
Sigma SI 7	yes	yes
Sigma SI 9	yes	yes
Sigma SI 17	yes	yes
Sigma SI 27	yes	yes
Sigma SI 37	yes	yes
Sigma SI 66	yes	yes
Material of the plates	1.4404, 1.4571, Titan	1.4404, 1.4571, Titan
Thickness of the plates mm	0,6 - 1,0	0,6 - 1,0
Design of the support stand	stainless, carbon steel +lacquer	stainless, carbon steel +lacquer
Sealing material	NBR, EPDM, Viton, AFM 34, PTFE	NBR, EPDM, Viton, AFM 34, PTFE
Output - flow rate l/h	150 - 300 000	150 - 300 000
Working pressure	up to 25 bar	up to 25 bar
Working pressure at the use of titan plates	up to 8 bar	up to 8 bar
Working temperatures	up to 260°C	up to 260°C



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