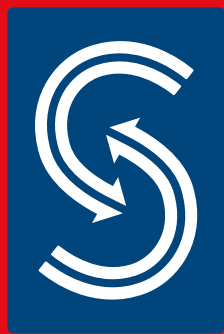


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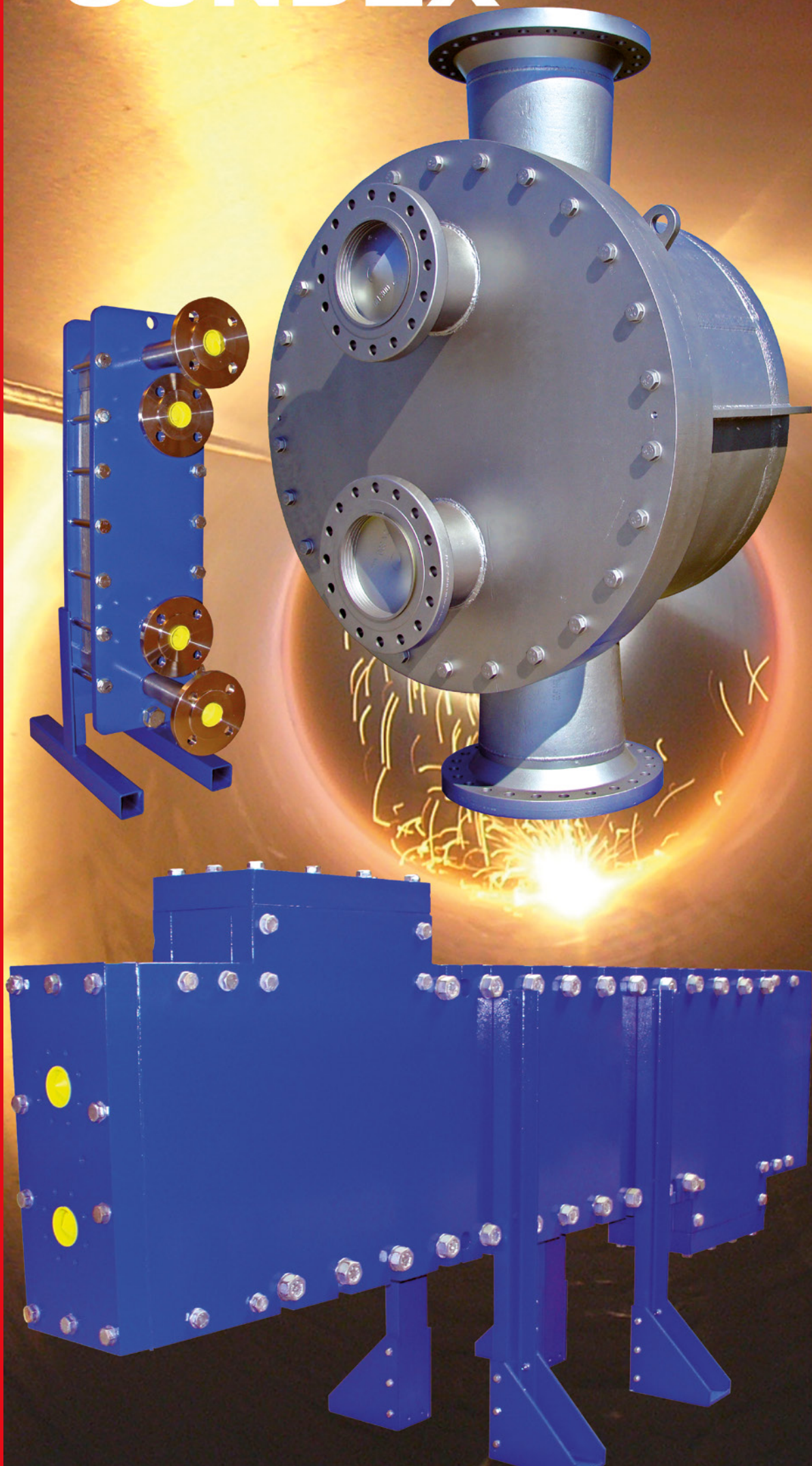
Welded Heat Exchangers SPS & SAW

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Sondex A/S is a Danish company specialized in the development, design and production of plate heat exchangers and freshwater distillers.

Since its foundation in 1984 Sondex has grown into a wide global network of branches, agencies and daughter companies, and is now considered a world leader in plate heat exchangers. Sondex is solving critical and complex heat transfer solutions in any heating and cooling area.

Besides the traditional plate heat exchangers the product range includes free flow, semi-welded, plate and shell, all welded and brazed plate heat exchangers, as well as single- and multi-step freshwater distillers, all of which are based on the latest flow and heat transfer technology.

Our network of highly qualified "world-wide" technicians are always available with support and advice of all Sondex products.

Effective up-to-date product development and accurate market analysis ensures that Sondex remains a market leader and maintains a strong company growth.

By means of a modern technology, Sondex has created a new and effective generation of welded plate heat exchangers, the SPS (Sondex Plate & Shell) and the SAW (Sondex All Welded).

Sondex Welded heat exchangers

The product development at Sondex has now made it possible to obtain thermal efficiency in a welded heat exchanger like in a traditional gasketed plate heat exchanger.

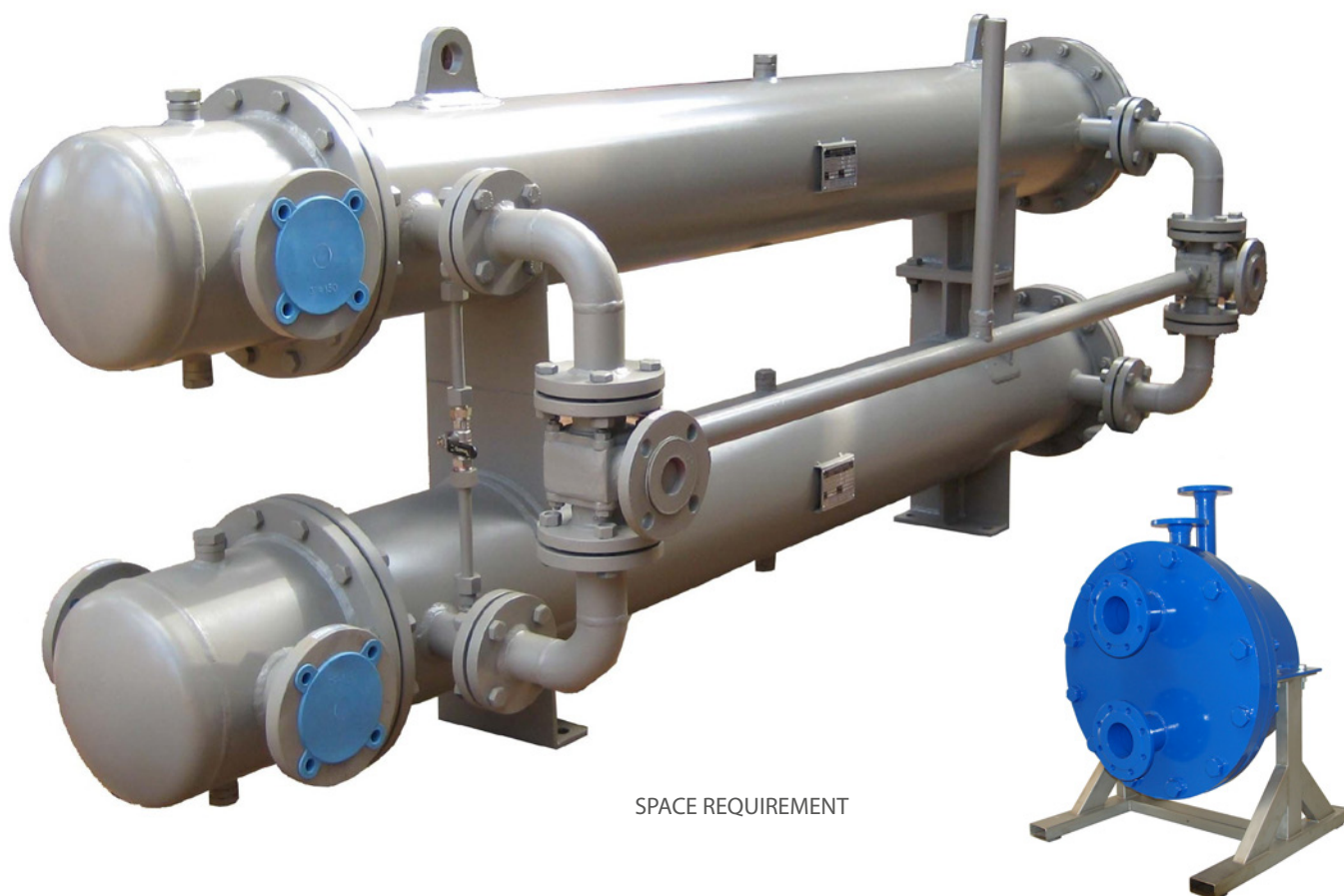
This has been achieved by transferring the technology from plate heat exchangers to the new welded range.

With this new technology within welded heat exchangers Sondex offers a range of heat exchangers working with high turbulences of the media in the heat exchanger. This then results in a high heat transfer efficiency.

The high efficiency of these heat exchangers can work with very close temperature gaps compared to traditional shell and tube heat exchangers. Compared to shell and tube heat exchangers the Sondex welded units, due to the high efficiency, only take up a minimum of the space and weight, needed for a shell and tube heat exchanger.

As there are no gaskets in the Sondex welded heat exchangers there are only very few applications, which cannot be handled in this type of heat exchangers.

Typical applications for this kind of heat exchangers are high temperature and high pressure applications as well as aggressive media, where there is no solution for gasketed plate heat exchangers.



Sondex Plate & Shell Heat Exchangers



The SPS plate heat exchanger uses laser welded cassettes, which are made up of two round plates welded together using modern laser welding machines.

These cassettes are designed for chemical processes, in the refrigeration industry such as condensers and evaporators, in the marine area, power stations, heat recovery and many other tasks where high pressure and very high/low temperatures are demanded.

The design pressure is up to 4.0 MPa.

The design temperature is from -100°C to 400°C.

Design Principles:

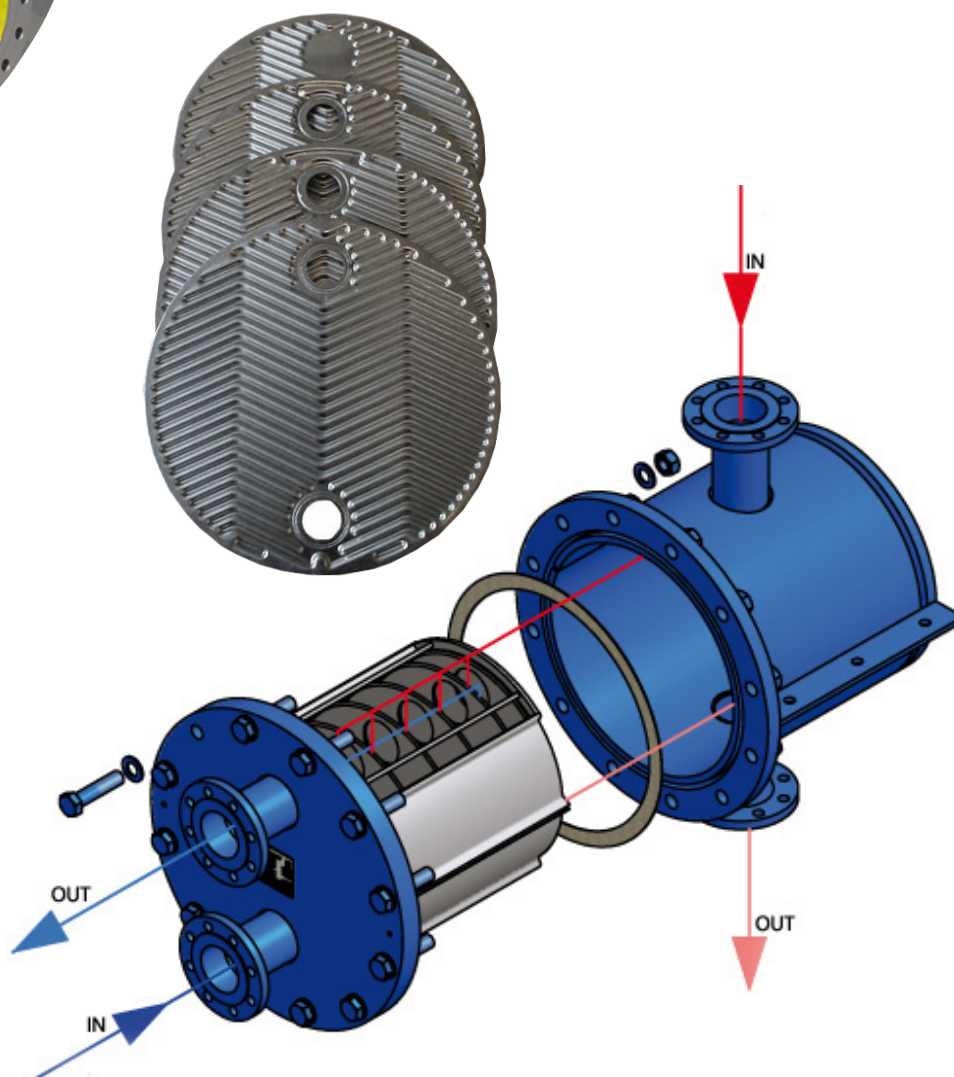
The SPS heat exchanger contains a round plate pack in which the waved “herringbone” pattern is pressed into each plate. The products pass through the port holes and into the gap between the plates.

The heat transfer happens when the warmer product transfers energy through the flow plates and delivers it to the colder opposing product without mixing both products.

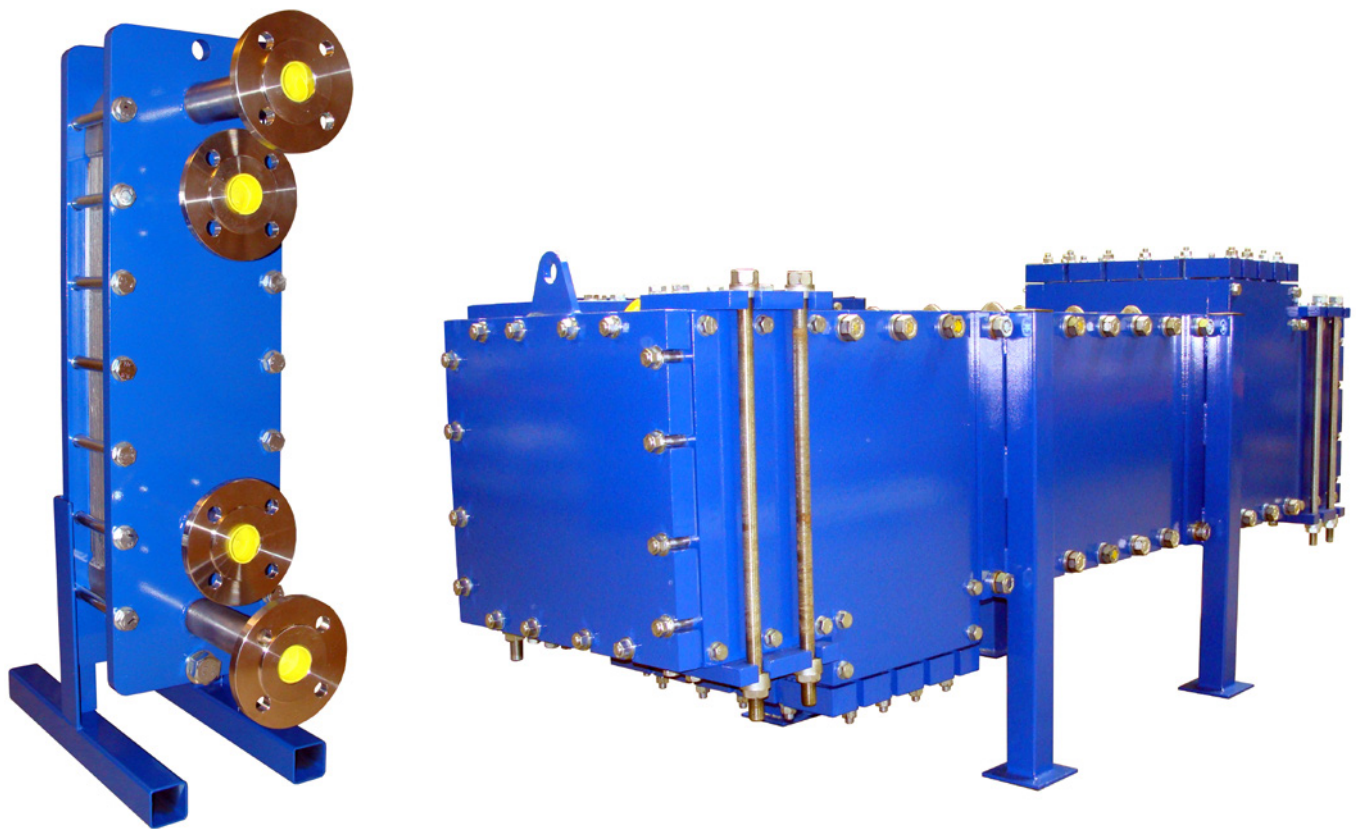
The “herringbone” pattern ensures turbulent flow within the effective area. Furthermore, this pattern brings “metallic” contact between the plates, and then optimal differential pressure is achieved.

Duty, type of product, temperatures, pressure drop and the thermal dynamic properties influence the choice of type, size of heat surface and thermal design of the plate pattern.

The plate pack is firmly fixed into the round shell.



Sondex All Welded Heat Exchangers



The SAW heat exchanger is built into a frame with its welded plate pack. The perfect solution for heat transmission duties, which cannot be handled in a normal gasketed plate heat exchanger because of a too high design temperature, design pressure, or if there is no suitable gasket material for the media, which are to be treated in the heat exchanger.

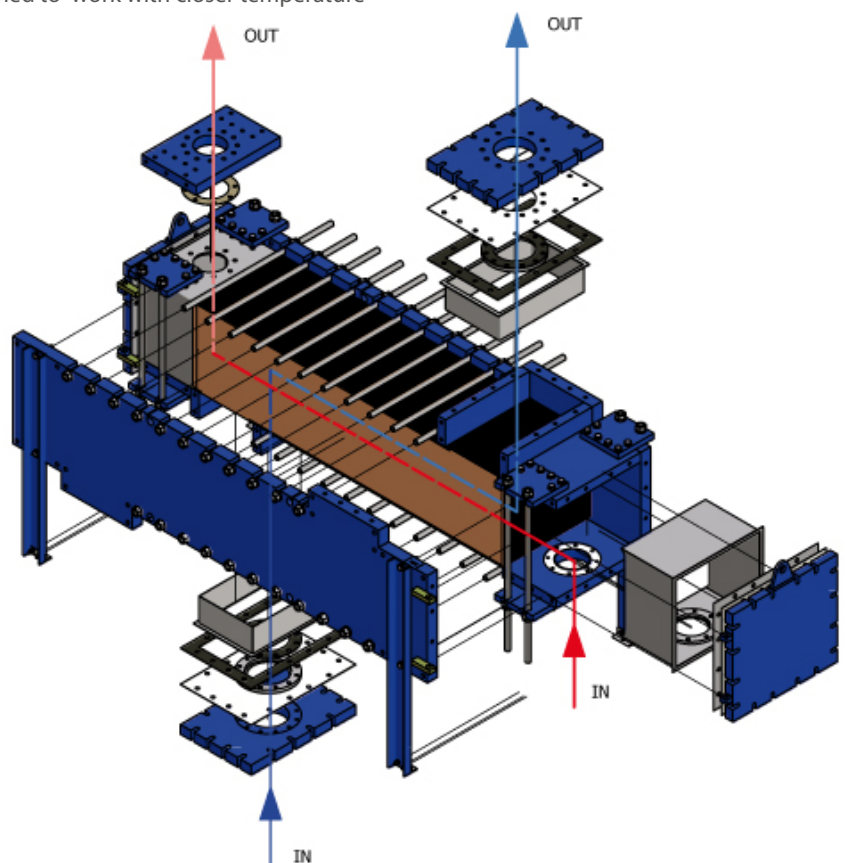
The applications for the SAW heat exchanger are the same as for the SPS heat exchanger. The only difference is that the SAW exchanger is designed to work with closer temperature approaches.

The SAW heat exchanger is designed for temperatures from -100 to 400°C and design pressures up to 4,0 MPa.

Design Principles:

The SAW heat exchanger contains a laser, MAG or TIG welded plate pack, in which the heat transmission pattern is pressed into each plate.

The product passes counter current through the welded plates without any chance of mixing the two media.



Sondex Plate & Shell Heat Exchangers

The product range of Sondex welded heat exchangers consists at the moment of two different types of heat exchangers.

The SPS (Sondex Plate and Shell) Heat Exchangers

Within this range of SPS heat exchangers Sondex can offer a range of units from a DN25 to a DN350 connection on the plate side, and on the shell side from DN25 to DN1200. This range of SPS units makes Sondex one of the leading manufacturers of plate and shell heat exchangers.

The Sondex SPS type of heat exchangers is designed for working pressures up to 4.0 MPa and temperatures from -100 °C to 400° C.

Sondex SPS units are as standard produced with stainless steel plate packs and carbon or stainless steel shells. Other materials can be used after requisition

The SAW (Sondex All Welded) Heat Exchangers

This range of Sondex heat exchangers is designed to cover applications with close temperature approach between the two media in the heat exchanger.

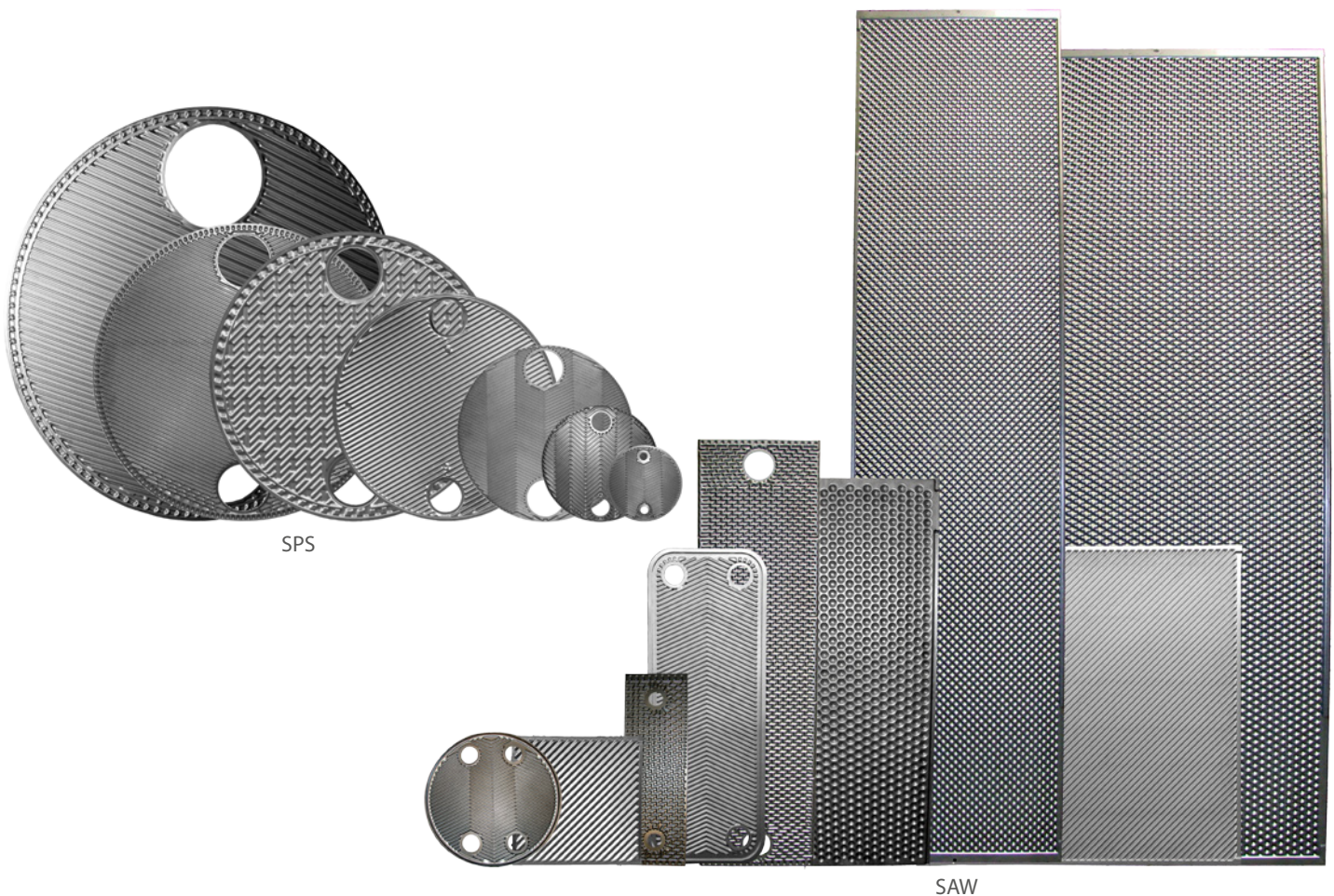
This range of SAW units has been designed as a plate design where there are contact points between the plates as well as with free flow (no contact points) on one of the flow channels. This makes it possible to use the welded heat exchanger also for products containing particles and fibres.

The robust design of the SAW heat exchanger allows for a design temperature of up to 400° and a design pressure of 4.0 MPa.

Applications of Sondex Welded Heat Exchangers

The applications of the Sondex range of welded heat exchangers are very big, as it appears from below list of possible applications of the units.

- District heating
- Power plants
- Chemical processing
- Steel industries
- Paper industries
- Oil and gas industries
- Petrochemical industries
- Marine applications
- Sugar industries
- Vegetable oil industries
- CIP heater in food & dairy plants
- Refrigeration plants



It is wise to choose **SONDEX** solutions!

Well-known for:

- High operation safety
- Exact energy transfer
- Low running costs
- Environmentally acceptable
- Energy saving

Gasketed Plate Heat Exchangers

Free Flow Plate Heat Exchangers

Semi-Welded Plate Heat Exchangers

Brazed Plate Heat Exchangers

Gasketed Plate Heat Exchangers

Gasketed plate heat exchangers are applicable in many areas for heating/cooling i.e. in the food industry, the chemical area, by heat recovery, in HVAC units and many other areas.

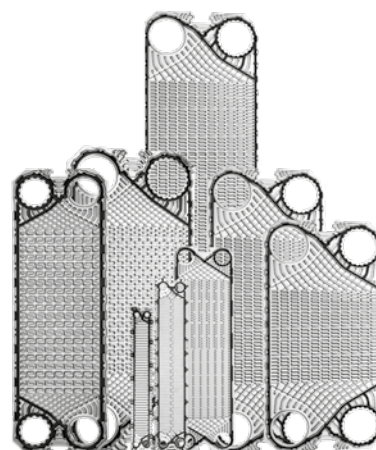
Pressure ratings up to 25 bar.

Temperature up to 200°C



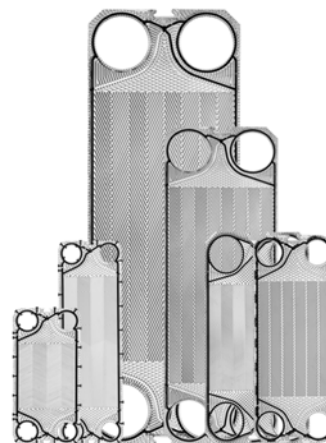
Free Flow Plates

Free flow plates are designed for liquids containing fibres or other particles which may clog up a traditional plate heat exchanger. Sondex free flow plates are designed without metal contact between the plates in the liquid area.



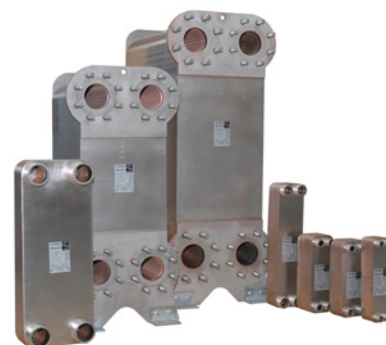
Semi-Welded Plate Heat Exchangers

Useful for high temperature and high pressure applications as well as for refrigeration and aggressive products. The plate pack is built up in plate cassettes (2 plates welded together) and can be easily disassembled and cleaned on the secondary side.



Brazed Plate Heat Exchangers

Contrary to the traditional plate heat exchanger, the brazed plate heat exchanger does not contain rubber gaskets and can thus operate continuously at temperatures from $\pm 180^{\circ}\text{C}$ up to 200°C . The operating pressure can be as high as 30 bar.



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