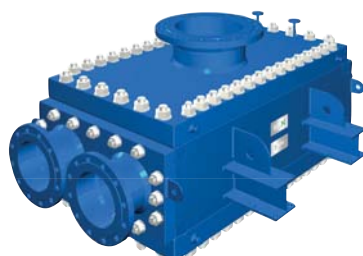


# Heat Transfer Technology

HEAT TRANSFER TECHNOLOGY TO MEET ALL YOUR NEEDS



## About APV

SPX provides advanced APV heat transfer solutions for cooling, heating, condensing and evaporation of process fluids - designed to solve heat transfer process challenges in a vast array of industries. They are designed to meet demanding process conditions and to optimize the utilisation of energy. APV heat transfer solutions have proven reliable and highly efficient helping customers worldwide to run their processes safely and economically. Since APV invented the plate heat exchanger in 1923 we have been pioneering applicable technology in pressing, shaping, welding, sealing and testing steel. Dedicated and specialized SPX staff around the world is committed to design and provide efficient and durable heat transfer solutions to help customers optimize energy utilization and minimize downtime for improved profitability.

## About SPX

Based in Charlotte, North Carolina, SPX Corporation (NYSE: SPW) is a global Fortune 500 multi-industry manufacturing leader. The company's highly-specialized, engineered products and technologies serve customers in three primary strategic growth markets: infrastructure, process solutions, and diagnostic systems. Many of SPX's innovative solutions are playing a role in helping to meet rising global demand for electricity, processed foods and beverages and vehicle services, particularly in emerging markets. The company's products include food processing systems for the food and beverage industry, power transformers for utility companies, cooling systems for power plants; and diagnostic tools and equipment for the automotive industry. For more information, please visit [www.spx.com](http://www.spx.com).

## Efficient heat transfer processes for improved performance

– higher heat recovery means lower energy costs

Energy consumption and runtime are key parameters affecting production costs in several sectors. Minimising energy consumption through more efficient process heat recovery is critical to profitability in the face of increasing energy costs. Improving process performance and avoiding unscheduled stoppages can increase runtime. Both deliver immediate and significant cost savings that translate directly to the bottom line.

SPX provides advanced APV heat transfer solutions for cooling, heating, condensing and evaporation of process fluids and for utility applications in a vast array of industries, ranging from food and beverage to oil and gas and industrial processes. Solutions are based on a complete range of plate-type heat exchanger technologies including gasketed, semi-welded and welded plate heat exchangers as well as tubular heat exchangers for hygienic applications. These range from high-capacity, heavy-duty units to small, compact designs, and are available either as standard solutions or as customised units based on ground-breaking designs and a vast variety of materials. APV heat exchangers may be supplied as standalone components or integrated into modules or complete systems.

### Lifetime Performance – maximising efficiency and ROI

SPX is committed to helping you improve the performance and profitability of your heat transfer equipment and solutions throughout its entire lifetime. Lifetime performance depends on a long line of factors that can affect uptime, efficiency and costs. SPX offers the following services to ensure maximum performance and return on investment from your plant and equipment.

### Service and maintenance assistance

Service centres and field service technicians available to troubleshoot and rectify any problems, and minimize unscheduled downtime

### Original spare parts

Robustness and reliability are critical in heat transfer solutions working in challenging process conditions found in several industries. The same applies to components and parts. To minimize the risk of unscheduled stoppages due to premature failure of non-original components and parts spare parts are available all over the world with short notice

SPX will be pleased to recommend an on-site spare parts inventory to cover your needs, balancing risk against capital outlay.



# Typical product applications

## Maintenance agreements

Many customers choose to guard against unexpected stoppages via maintenance agreements based on tried-and-tested standards for their equipment with any necessary adaptations to their particular situation and requirements. Maintenance agreements involve periodic visits by SPX specialists to service the equipment and take action to rectify any issues that could cause problems before their next visit.

## Refurbishment - maintaining performance

APV plate heat exchangers are designed for a long and trouble-free working life. Wear and tear are unavoidable, however, and at some point during their service life, refurbishment of the plate heat exchanger and replacement of the plate pack can bring a significant boost to performance and efficiency.

## On-site audits – reduce operating expenses

SPX engineers are also available to conduct on-site audits of your plant and equipment in order to identify areas where upgrades or replacements can further lower your cost of ownership by improving efficiency and reducing your operating and maintenance expenses.

## Global presence – dedicated people

The SPX global market presence extends throughout the world to where our customers are going — and where they're growing. APV heat transfer specialists assist customers all over the world in selecting the solutions that will deliver the best performance and ROI over a long service life in their particular applications and process conditions. In addition to leading technology and the wealth of experience and expertise available, one of the main reasons why customers prefer heat transfer solutions from SPX is the close and confidential partnership between our engineers and the customer's own experts. A global team of highly qualified and experienced specialists with special knowledge of sector needs and solution options are dedicated to bring you the best of heat transfer.



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## Dairy, Food & Beverage



## Oil & Gas



## Petrochemical & Chemical



## Power



## HVAC



## Industrial Process



## Marine



## Pharmaceutical & personal care



# Plate Heat Exchangers for Efficient Heat Transfer

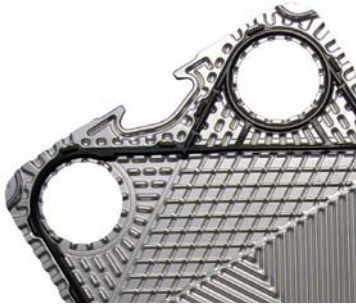
## EnergySaver

For processing low-viscosity media. Designed for high thermal efficiency with a very close temperature approach.



## DuraFlow

For medium or high viscosity media. Designed for continuous process and long run time.



## EasyFlow

For media containing fibres or pulp, requiring highest possible recovery without blocking.



## DuoSafety

The DuoSafety system is an early warning system, designed to detect leakages at an early stage and enable the end user to take precautions against intermixing of the fluids.

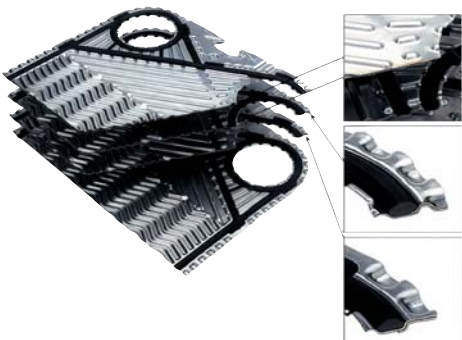
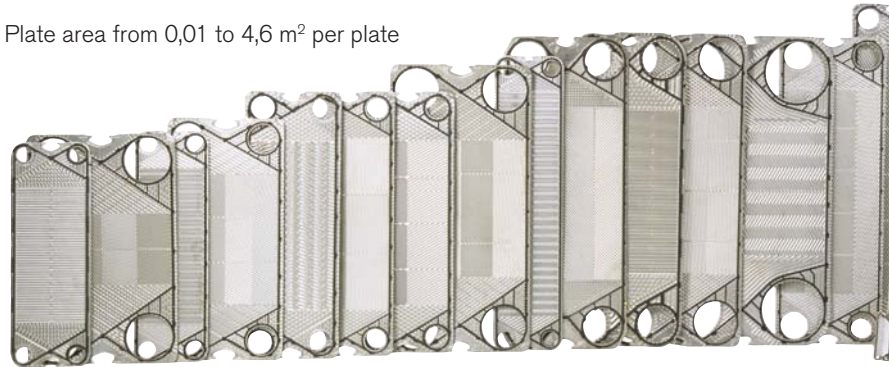


Plate area from 0,01 to 4,6 m<sup>2</sup> per plate



## Hygienic frames

Extendable frames to meet stringent hygienic requirements.

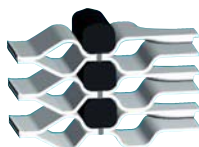
## Industrial frames

Wide range of extendable frames for meeting various quality needs.

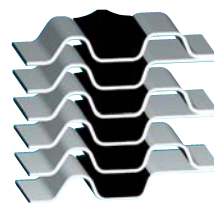


## ParaWeld

Welded plate pairs. Designed with welded channels allowing handling of aggressive fluids. Widely used for single and two-phase heat transfer in refrigeration and in chemical, industrial and petrochemical applications.



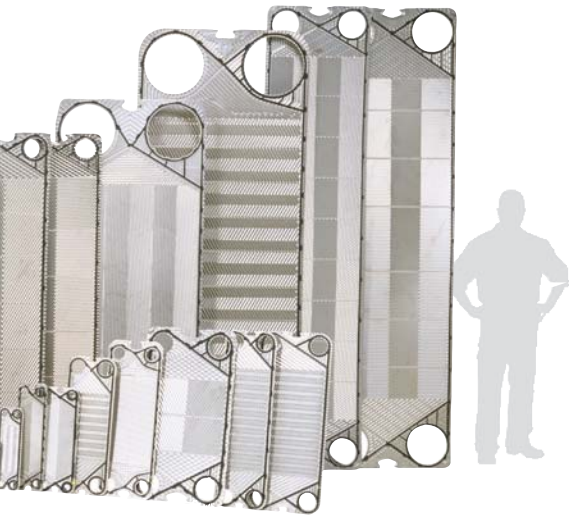
ParaWeld



Conventional



Welding on plate



### Plate Evaporator

For the concentration of milk, juices, syrups, animal and vegetable extracts, effluents and industrial streams.



### ParaBrazed

A comprehensive range of compact brazed plate heat exchangers especially suited for water heater, district heating units, gas boilers, and solar heating.

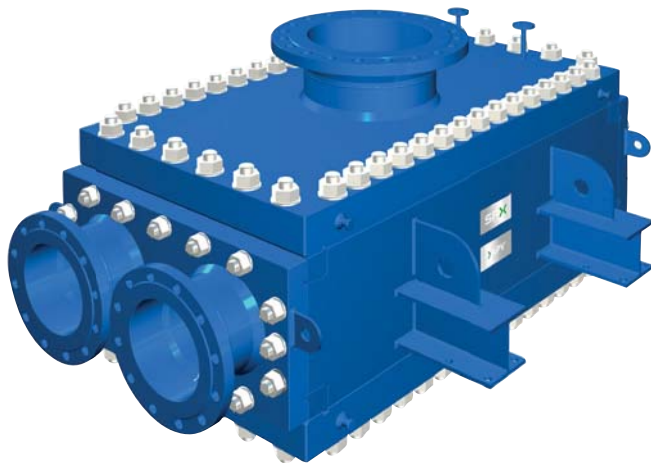
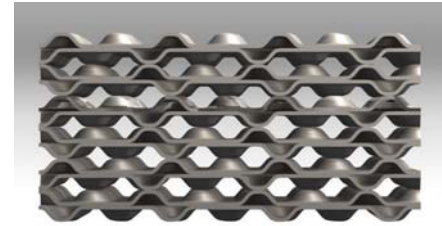


SELECTION GUIDE	EnergySaver	DuraFlow	EasyFlow	DuoSafety	ParaWeld	ParaBrazed	PlateEvaporator
DESCRIPTION	Plate with narrow gap and many contact points to secure high thermal efficiency	Plate with wide gap and reduced number of contact points to ease the flow of viscous products and products containing small particles. Designed for continuous, durable flow and long run time	Wide gap plate with reduced number of contact points to ease the flow of viscous products and products containing fibres or pulp. Designed for long run time, continuous flow, and extra gentle product treatment	Double wall (for added safety) consisting of 2 layers of plates per flow plate in order to drain any fluid from leakage to the atmosphere. For use in gasketed plate heat exchangers	Corrugated plates welded in pairs. Pairs are separated by gaskets (welded pairs on process side, normal gasket technology on the secondary side)	Plate heat exchanger without gaskets. Copper soldering joins the plates	Falling film or sometimes climbing/falling film evaporation in low height modular plate evaporator yielding superior quality concentrates
MATERIAL	Plates: AISI 316, AISI 304, Titanium and most alloys Gaskets: NBR per, EPDM, FKM, and others	Plates: AISI 316, AISI 304, Titanium and most alloys Gaskets: NBR per, EPDM, FKM	Plates: AISI 316, AISI 304, Titanium and most alloys Gaskets: NBR per, EPDM, FKM, and others	Plates: AISI 316, Titanium and other alloys Gaskets: NBR per, EPDM, FKM	Plates: AISI 304, AISI 316, Titanium, C2000, and most alloys. Gaskets: NBR, EPDM, FKM, and other types	AISI 316L (and copper)	Plates: AISI 316, 904L, Nickel alloys Gaskets: NBR, EPDM
TEMPERATURE	Rubber gaskets: -35°C to 180°C	-35°C to 180°C	-35°C to 180°C	-35°C to 180°C	Rubber gaskets: -45°C to 250°C	-50°C to 195°C	-30°C to max. 130°C
PRESSURE	25 bar gauge	0 - 16 bar gauge	0 - 16 bar gauge	0 - 16 bar gauge	0 - 35 bar gauge	0 - 30 bar gauge	Vacuum to 2 bar gauge
TRANSMISSION AREA/DUTY	Up to 3,800 m <sup>2</sup>	Up to 2,800 m <sup>2</sup>	Up to 680 m <sup>2</sup>	Up to 650 m <sup>2</sup>	Up to 1,800 m <sup>2</sup>	Up to 75 m <sup>2</sup>	Up to 400 m <sup>2</sup>
MAINTENANCE ACCESS	Full access for cleaning and inspection	Full access for cleaning and inspection	Full access for cleaning and inspection. Sediments may be CIP cleaned	Full access for cleaning and inspection	Welded side: Cleaning by circulation of cleaning fluids (CIP)	Cleaning by circulation of cleaning fluids (CIP)	Full accessibility to heat transfer surfaces. Easy to dismantle for inspection of all pro-duct wetted parts

# Welded Plate Heat Exchangers for High Temperature and Pressure

## Hybrid

Fully-welded plate heat exchanger for heating, cooling, condensing and evaporating. Typically used for high temperature and high pressure duties, e.g. in power, chemical and sugar industries.



SELECTION GUIDE	ParaTube	Hybrid	District Heating Unit	Compakva	Water Desalination Unit
DESCRIPTION	Tubular heat exchanger with corrugated tubes or straight tubes. Available types include: Double tube, Triple tube, Quadruple tube or Multi-tube	A fully-welded, gasket free heat exchanger combining highly efficient plates and a strong vessel construction. The asymmetric and flexible design allows extremely low pressure drop if required. Can be fully customized to meet individual needs	Modular installation mounted on a skid consisting of heat exchangers together with pumps, valves, instruments, safety equipment and automation such as PLC and / or frequency converters	For heating of domestic tap water and for direct and indirect heating	The water desalination unit is a single stage plate type based evaporator and condenser, separated by stainless steel demister
MATERIAL	AISI 304L, AISI 316L, Duplex SAF 2205, SAF 2507, and other alloys	Plates: AISI 316L or most alloys. Vessel: AISI 316L or carbon steel	Plate heat exchanger types: Gasketed, brazed, plate and shell Pipes & fittings: According to customers specifications	Stainless steel AISI 316 and red bras	Plates (evaporator and condenser): Titanium Vessel: AISI 316L, with SMO 254 reinforcement
TEMPERATURE	-30°C up to 300°C	-200°C to 400°C	Up to 200°C	Up to 130°C	Jacket water: 70°C -90°C. Also available for steam injection Sea water: 0°C - 32°C
PRESSURE	0 up to 100 bar gauge	0 to 40 bar gauge	10 to 25 bar gauge	Up to 16 bar gauge	0 up to 16 bar gauge
TRANSMISSION AREA/DUTY	Up to 73 m <sup>2</sup> in one standard module	Up to 1,800 m <sup>2</sup> per unit	Up to 50 MW	1-8 homes	Up to 35 m <sup>3</sup> /h
MAINTENANCE ACCESS	Full inspection on product side in all versions. Further cleaning by circulation of cleaning fluids (CIP)	Full accessibility for cleaning and inspection without removal of piping. Further cleaning by circulation of cleaning fluids (CIP)	All vital components are easily exchangeable	The plate heat exchanger is bolted together enabling easy cleaning and replacement. Can be extended if necessary	Full access for cleaning and inspection

# Tubular Heat Exchangers for Food and Beverage Applications

## ParaTube

For single or multi-purpose product processing. Excellent for food and beverage applications processing products with particles, products sensitive to texture changes and high viscosity products.



## Ready to Install Solutions

### District Heating and Cooling Unit

Standard designed prebuilt units for central heating, central cooling and hot tap water. Designed for easy and timesaving installation and commissioning.



### Water Desalination Unit

For the desalination of sea water, the production of potable water and fresh utility water.



### Compakva

A range of small and compact water heaters and district heating units characterized by innovative technology and design. For heating of domestic tap water and for direct and indirect heating.



### Certification – a global platform

APV heat transfer solutions meet the pressure equipment requirements in Europe, Asia and Americas. They are produced in accordance with the European Pressure Equipment Directive (PED 97/23/EU) and are CE marked accordingly. They can be delivered according to GB standards and comply with ASME U-Stamp and National Board Certification. APV sanitary heat exchangers comply with international hygienic standards including 3A and FDA. Our main production facilities are certified in accordance with the EN ISO 9001 quality assurance standard, and selected sites hold the ISO 3834 Welding Workshop Approval. We are well experienced in working with notified bodies including par example DNV, ABS, BV, GL, Lloyds, CCS, and others. In addition, we hold the Russian GOST/TR approval.

# Heat Transfer Technology

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TO MEET ALL YOUR NEEDS**



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### ABOUT SPX

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