

# Heat exchangers

## Heating and cooling efficiency for a wide variety of industries and applications

Heat exchangers are at the heart of many processes in the food and beverage industries as well as in the industrial, energy and marine sectors. SPX Flow Technology offers, with the APV brand, a comprehensive range of efficient, durable and economic heat transfer solutions for any duty, including acid, gasses, oils, fats, detergents and milk, and for

processes characterised by extreme pressure, vacuum, pressure drop limitation or high heat recovery.

The APV range includes gasketed, semi- and fully welded, and brazed plate heat exchangers, direct infusion and injection heat exchange as well as tubular and scraped surface heat exchangers.

## Gasketed plate heat exchanger - ParaFlow

### Gasketed plate heat exchangers



#### Specifications

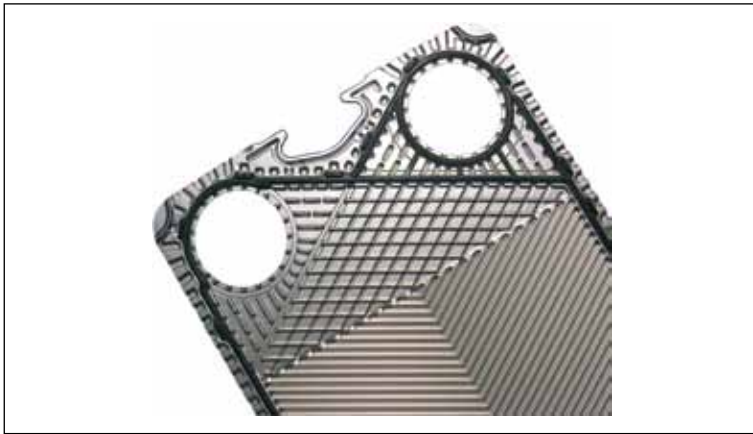
Field of application	Widely used for heating, cooling, pasteurizing and heat recovery in hygienic and industrial applications including food and beverage industries, chemical, petrochemical, oil and gas, power, energy, other industrial sectors, and marine applications
Description	Plate heat exchangers with loose, gasketed plates compressed in a frame. Designed for superior heat transfer coefficients, compact installation, and highest possible efficiency and optimum run-time. ParaFlow heat exchangers are available in various plate designs, plate types, corrugation patterns and sizes to match customer requirements
Material	Plates: AISI 316, AISI 304, Titanium, and most alloys Gaskets: NBR per, EPDM HT, FKM, and others Frames: Stainless steel or painted Carbon steel
Temperature	Rubber gaskets: -35 - 180°C (-31 - 356°F) Graphite gaskets: -20 - 250°C (-4 - 482°F)
Pressure	0 - 25 bar gauge (0 - 362 Psi)
Transmission area/duty	Up to 3,200 m <sup>2</sup> (34,445 ft <sup>2</sup> )
Maintenance access	Full access for cleaning and inspection

#### Advantages

- Compact and durable designs
- High efficiency due to full countercurrent flow
- Resistant to thermal stress
- Glue-free gaskets
- Possibility of combining different gasket materials for cost-effective solutions
- Easy to clean

# EnergySaver plate type

Best heat transfer value for money with less pumping of cooling or heating water



## Advantages

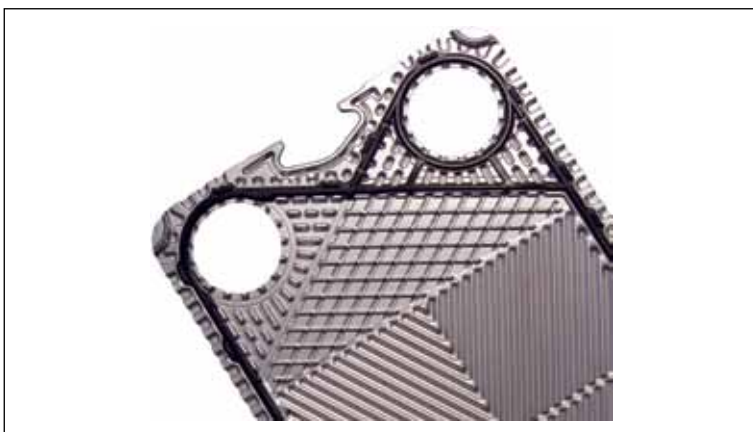
- Superior heat transfer efficiency
- Compact and durable designs
- Glue-free gaskets
- Easy to clean

## Specifications

Field of application	For processing low-viscosity media. Designed for high thermal efficiency with a very close temperature approach
Description	Plate with narrow gap and many contact points to secure high thermal efficiency
Material	Plates: AISI 316, AISI 304, Titanium and most alloys Gaskets: NBR per, EPDM HT, FKM, and others
Temperature	Rubber gaskets: -35 - 180°C (-31 - 356°F) Graphite gaskets: -20 - 250°C (-4 - 482°F)
Pressure	25 bar gauge (362 Psi)
Transmission area/duty	Up to 3,800 m <sup>2</sup> (40,903 ft <sup>2</sup> )
Maintenance access	Full access for cleaning and inspection

# DuraFlow plate type

For continuous process and long run time



## Specifications

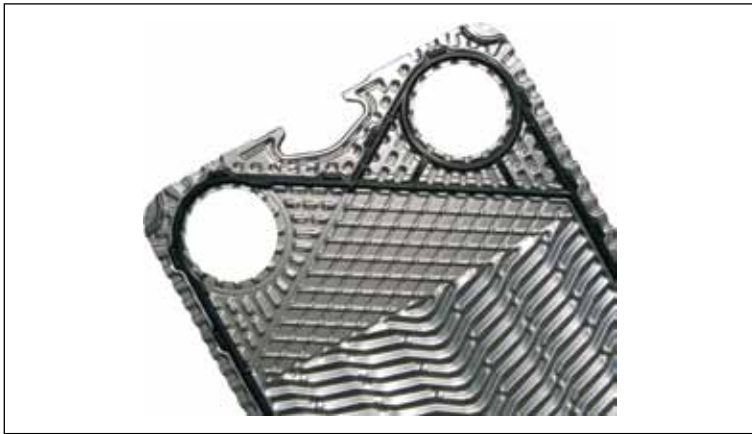
Field of application	For medium or high viscosity media
Description	Plate with wide gap and reduced number of contact points to ease the flow of viscous products and products containing small particles. Designed for continuous, durable flow and long run time
Material	Plates: AISI 316, AISI 304, Titanium and most alloys Gaskets: NBR per, EPDM HT, FKM
Temperature	-35 to 180°C (-31 - 356°F)
Pressure	0 - 16 bar gauge (0 - 232 Psi)
Transmission area/duty	Up to 1,800 m <sup>2</sup> (19,375 ft <sup>2</sup> )
Maintenance access	Full access for cleaning and inspection

## Advantages

- Excellent heat recovery
- Gentle product treatment
- Long run time

# EasyFlow plate type

When you need extra gentle product treatment and superior run time



## Advantages

- Excellent heat recovery
- Gentle product treatment
- Long run-time

## Specifications

Field of application	For media containing fibres or pulp, requiring highest possible heat recovery without blocking
Description	Wide gap plate with reduced number of contact points to ease the flow of viscous products and products containing fibres or pulp. Designed for continuous, durable flow and long run time
Material	Plates: AISI 316, AISI 304, Titanium and most alloys Gaskets: NBR per, EPDM HT, FKM, and others
Temperature	-35 - 180°C (-31 - 356°F)
Pressure	0 - 16 bar gauge (0 - 232 Psi)
Transmission area/duty	Up to 300 m <sup>2</sup> (3,229 ft <sup>2</sup> )
Maintenance access	Full access for cleaning and inspection. Sediments can be CIP cleaned

# Gasketed plate heat exchanger - DuoSafety

Double wall plate design for reduced risk of intermixing



## Advantages

- Reduced risk of intermixing of fluids
- 100% visual inspection possible
- Good thermal efficiency
- Combined plate designs and material for optimised solution
- No welds

## Specifications

Field of application	When added security against intermixing is needed in the unlikely event of plate failure or corrosion. Widely used in hygienic applications
Description	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.
Material	Plates: AISI 316, Titanium and other alloys Gaskets: NBR per, EPDM HT, FKM
Temperature	-35 - 180°C (-31 - 356°F)
Pressure	0 - 16 bar gauge (0 - 232 Psi)
Transmission area/duty	Up to 400 m <sup>2</sup> (4,305 ft <sup>2</sup> )
Maintenance access	Full access for cleaning and inspection

# Gasketed plate heat exchanger - Hygienic frames

Extendable frames to meet stringent hygienic requirements



## Specifications

Field of application	Hygienic applications mainly in dairy and beverage business
Description	Solid or clad stainless steel frames. Available in either tie bar or spindle design
Pressure	0 - 25 bar gauge (0 - 362 Psi)
Connections	20 mm - 150 mm (3/4" - 6")

## Advantages

- Designed to meet high quality and hygienic standards
- Tie bars are removed horizontally sideways without removing the nuts, enabling quick dismantling

# Gasketed plate heat exchanger - Self-closing frames

Automatic self-closing frames for hygienic applications



## Specifications

Field of application	Hygienic applications requiring frequent and easy opening of the frame without moving or removing any components
Description	Stainless steel clad frames. Intelligent PLC control to reduce operator error
Pressure	0 - 13 bar gauge (0 - 188 Psi)
Connections	50 mm - 100 mm (2" - 4")

## Advantages

- Fully automated frame for easy opening and closing at the push of a button – minimum operator involvement
- Intelligent PLC ensures proper opening and closing preventing damage due to plate misalignment or over-compression
- Total run time display since the last opening enables optimum maintenance planning



# Gasketed plate heat exchanger - Industrial frames

Wide range of extendable frames to meet various quality needs



## Specifications

Field of application	Heating, cooling and heat recovery applications in the industry and energy segment for any duty including water, seawater, glycol, acid, gasses, oils, fats and detergents
Description	Industrial frames in painted carbon steel. Available in either tie bar or spindle design
Pressure	0 - 25 bar gauge (0 - 362 Psi)
Connections	20 mm - 500 mm (3/4" - 20")

## Advantages

- Powder coating provides a strong surface of the head and follower
- Tie bars are removed horizontally sideways without removing the nuts, enabling quick dismantling
- Meet most industrial design standards, e.g. ASME, U-Stamp and PED Cat. IV (heavy duty approval)

# Semi-welded plate heat exchanger - ParaWeld

Welded plate pairs design



## Specifications

Field of application	Widely used for single and two-phase heat transfer in refrigeration, chemical, industrial and petrochemical markets. Designed with welded channels allowing handling of aggressive fluids
Description	Corrugated plates welded in pairs. Pairs are separated by gaskets (welded pairs on process side, normal gasket technology on the secondary side)
Material	Plates: AISI 316, AISI 304, Titanium, C2000, and most alloys Gaskets: NBR, EPDM, FKM, Paramine and other types
Temperature	Rubber gaskets: -45 - 250°C (-49 - 482°F)
Pressure	0 - 35 bar gauge (0 - 507 Psi)
Transmission area/duty	Up to 2,000 m <sup>2</sup> (21,528 ft <sup>2</sup> )
Maintenance access	Welded side: Cleaning by circulation of cleaning fluids (CIP) Gasketed side: Full access for cleaning and inspection

## Advantages

- High efficiency due to full countercurrent flow
- Reduced risk of leakage
- Resistant to thermal stress
- Compact and space-saving design
- Possibility to combine different gasket materials for cost-effective solution

# Plate evaporator

## Rising/falling film plate evaporator



Specifications	
Field of application	Food, juice and dairy products such as skim milk, meat and vegetable broths, coffee, fruit juice, sugar and gelatin
Description	Rising and falling film type evaporative exchanger with vapor/liquid separators designed for vacuum service. There are two size plates available for small to medium plants. Can be arranged in single or multiple effects for steam efficiency. Excellent choice for purees and other pulpy products. Suitable for products up to 600 cps
Capacity	100 - 10,000 kg/h water removal
Product temperature	26 - 100°C (78.8 - 212°F)
Pressure	0.034 - 2 bar (0.5 - 29.001 Psi)
Dimensions	Capacity dependent. Small systems can be designed for 3 m height
Options	Complete process integration and automation. Aroma recovery available for juice plants

### Advantages

- Enhanced quality of food products
- Low head room requirement
- Easy accessed for cleaning
- Flexibility in capacity by adding plates

# Plate evaporator

## Falling film plate evaporator



Specifications	
Field of application	Food, juice and dairy products such as skim milk, meat and vegetable broths, coffee, fruit juice, sugar and pharmaceuticals
Description	Falling film type evaporative exchanger with vapor/liquid separators designed for vacuum service. There are three size plates available for medium to large plants. Can be arranged in single or multiple effects or MVR for high thermal efficiency. Excellent choice for making concentrates requiring absolute highest product quality
Capacity	500 - 25,000 kg/h water removal
Product temperature	26 - 100°C (78.8 - 212°F)
Pressure	0.034 - 2 bar absolute (0.5 - 29.001 Psi)
Dimensions	Capacity dependent
Options	Complete process integration and automation. Aroma recovery available for juice plants

### Advantages

- Shorter residence time and improved product quality compared to traditional falling film evaporators
- Rapid start-up and minimum wastage at shut-down due to low liquid hold-up
- Flexible capacity to meet varying duty requirements
- Economic processing of small batches
- Low height requirements (< 6 m) - will usually fit within a standard building - providing savings in installation costs

# Water desalination unit - WDU

Fresh water generator with prolonged service life



## Specifications

Field of application	For the desalination of sea water, the production of potable water, and fresh utility water
Description	The water desalination unit is a single stage plate type based evaporator and condenser, separated by stainless steel demister
Material	Plates (evaporator and condenser): Titanium Vessel: AISI 316L, with SMO 254 reinforcement
Temperature	Jacket water: 70 - 90°C (160 - 190°F) Also available for steam injection Sea water: 0 - 32°C (32 - 90°F)
Pressure	6 bar gauge (87 psi)
Transmission area/duty	Up to 60 m <sup>3</sup> /24 h (16,000 U.S. g/24 h)
Maintenance access	Full access for cleaning and inspection

## Advantages

- Reduced heat consumption due to pre-heating of feed water
- Reduced maintenance costs
- Prolonged service life thanks to extensive use of non-corrosive materials
- Reduced installation costs
- Reduced fouling due to pre-installed and adjustable chemical dosing unit
- Automatic feed water dosing valve securing optimized fresh water production

# Fully welded plate heat exchanger - Hybrid

For high temperatures and high pressures



## Specifications

Field of application	For heating, cooling, condensing and evaporating. Typically used for high temperature and high pressure duties, e.g. in power, chemical, petrochemical and sugar industries
Description	A welded, gasket-free plate heat exchanger combining highly efficient plates and a strong vessel construction. Designed to operate under harsh conditions where other heat exchangers may give up due to temperature and pressure limitations; allowing extremely low pressure drop if required. With its compact and flexible design the APV Hybrid heat exchanger takes up 5-10 times less space than traditional tubular heat exchangers for the same duty.
Material	Plates: AISI 316L or most alloys Vessel: AISI 316L or carbon steel
Temperature	Operating temperature, PED 97/23 EK: -40°C (-40°F) up to 350°C (662°F) Operating temperature, ASME VIII: -28°C (-19°F) up to 350°C (662°F)
Pressure	-1 - 32 bar gauge (-14 - 464 Psi)
Transmission area/duty	Up to 436 m <sup>2</sup> per unit (4,693 ft <sup>2</sup> )
Maintenance access	Full accessibility for cleaning and inspection without removal of piping. Further cleaning by circulation of cleaning fluids (CIP)

## Advantages

- High efficiency
- High capacity
- Low pressure drop
- Extremely flexible
- Easy cleaning and inspection
- Low maintenance costs
- Space saving



# Brazed plate heat exchanger - ParaBrazed

## Compact brazed plate heat exchangers



### Specifications

Field of application	A comprehensive range of compact brazed plate heat exchangers for HVAC applications. Especially suited for water heaters, district heating units, gas boilers, and solar heating
Description	Plate heat exchanger without gaskets. The plates are joined by copper soldering
Material	AISI 316L (and copper)
Temperature	-50 - 195°C (-58 - 383 °F)
Pressure	0 - 30 bar gauge (0 - 435 Psi)
Transmission area/duty	Up to 75 m <sup>2</sup> (0 - 807 ft <sup>2</sup> )
Maintenance access	Cleaning by circulation of cleaning fluids (CIP)

### Advantages

- Very compact
- Large temperature span
- Wide pressure range
- Economic and efficient

## District heating and cooling solutions

### Pre-built district heating and cooling units



### Specifications

Field of application	Customer or standard designed pre-built units for central heating, central cooling and instantaneous hot water heating solutions
Description	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
Material	Plate heat exchanger types: Gasketed, brazed, plate and shell Pipes and fittings: According to customer specifications
Temperature	Up to 200°C (392 °F)
Pressure	10 - 25 bar gauge (145 - 362 Psi)
Transmission area/duty	Up to 50 MW (170,601,883 Btu/h)
Maintenance access	All vital components are easily exchangeable

### Advantages

- Designed for easy and time-saving installation and commissioning
- Pressure and functional testing before shipment
- Internal wiring done at factory
- Easy to install
- Tailor made solutions
- 20+ years experience



# District heating solutions - Compakva

Instantaneous compact water heaters and district heating units - innovative technology and design



Specifications	
Field of application	For heating of domestic tap water and for direct and indirect heating
Description	The series of Compakva units ranges from a simple water heater, consisting of a multi-functional block, a plate heat exchanger and thermostatic valve to more advanced district heating units with additional equipment including two plate heat exchangers, pump, expansion vessel, and thermometer
Material	Stainless steel AISI 316 and red bras
Temperature	Up to 130°C (266 °F)
Pressure	Up to 16 bar gauge (232 Psi)
Transmission area/duty	1 - 8 homes
Maintenance access	The plate heat exchanger is bolted together enabling easy cleaning and replacement. Copper has not been used in the plate heat exchanger, which reduces the risk of galvanic corrosion that can cause leakage

### Advantages

- The smallest unit of its type - up to 30% less space requirement
- High thermal efficiency
- Low operating costs
- Low power consumption
- Easy to mount and clean

# Tubular heat exchanger - ParaTube

Tubular heat exchangers for single or multi-purpose product processing



Specifications	
Field of application	For food and beverage applications processing products with particles, products sensitive to texture changes, and high-viscosity products, e.g. pulpy juices, sauces and soups, dairy products like milk and yoghurts, purées and concentrated juices, desserts
Description	Tubular heat exchanger with corrugated and smooth or straight tubes. Available types include: Double tube, Triple tube, Quadruple tube or Multi-tube
Material	AISI 304L, AISI 316L, Duplex SAF 2205, SAF 2507, and other alloys
Temperature	-30°C - 300°C (-22 - 572 °F)
Pressure	0 up to 100 bar gauge (1,450 Psi)
Transmission area/duty	Up to 73 m <sup>2</sup> in one standard module (786 ft <sup>2</sup> )
Maintenance access	Full inspection on product side in all versions. Further cleaning by circulation of cleaning fluids (CIP)

### Advantages

- High flexibility in design to match multi-purpose line or plant
- Wide product range to cover almost any challenge in product processing
- Easy and low-cost maintenance (universal gaskets)

# Scraped surface heat exchanger - VT+

## Light and medium duty heat exchanger



### Specifications

Field of application	Dairy and food industries
Description	Vertical cylinder arrangement mounted on a base console with gear motor. The dasher top bearing is inside the product area, whilst the gear motor supports the dasher bottom. This means that there is only one shaft seal for each SSHE cylinder. Heat transfer surfaces: Cylinder size 422: 0.19 m <sup>2</sup> (2.1 ft <sup>2</sup> ) Cylinder size 460: 0.44 m <sup>2</sup> (4.7 ft <sup>2</sup> ) Cylinder size 660: 0.68 m <sup>2</sup> (7.3 ft <sup>2</sup> ) Cylinder size 680: 0.87 m <sup>2</sup> (9.4 ft <sup>2</sup> )
Capacity	Dependent upon product and application, but typically up to 3,000 or 5,000 kg/h (6,600 - 11,000 lbs/h)
Temperature	Working temperature up to 150°C (300°F)

### Advantages

- Best solution for treatment of viscous and heat-sensitive products
- Capable of handling products with large particles
- Long running time between CIP when processing heat-sensitive products
- Suitable for aseptic operation
- EHEDG-tested and approved

# Scraped surface heat exchanger - HDRT and HEXRT

## Heavy-duty (HD) and heavy-duty extra (HEX) heat exchanger



### Specifications

Field of application	Heating, cooling, crystallising and freezing in the dairy, food and other process industries
Description	HDRT and HEXRT heat exchangers are designed to handle high-viscosity products in heating, cooling, crystallising and freezing applications. They feature a horizontal cylinder arrangement based on a rigid construction with demountable cylinder end doors and strong bearings outside the product area to support each dasher end. The RT appellation means that the gear motor is flanged direct on to the SSHE cylinder module. Heat transfer surfaces: Cylinder size 648: 0.55 m <sup>2</sup> (5.9 ft <sup>2</sup> ) Cylinder size 672: 0.84 m <sup>2</sup> (9.0 ft <sup>2</sup> )
Capacity	Dependent on product and application, but typically up to 3,000 or 5,000 kg/h (6,600 - 11,000 lbs/h)
Temperature	Working temperature up to 150°C (300°F)

### Advantages

- High-precision machined and polished Duplex quality and Bimetal cylinders
- Also suitable for evaporative refrigerants (R717 and R404a etc.)
- Product pressure up to 30 bar (435 Psi)
- Various dasher diameters, scraper blade types and configurations, as well as powerful dasher motors

# Scraped surface heat exchanger - HT 680

## Light and medium duty SSHE



### Specifications

Field of application	Dairy and food industries
Description	Horizontal cylinder arrangement mounted on a frame. The dasher is supported in both ends outside the product area, which makes the dasher pressure balanced. The heat exchanger type HT 680 is designed according to the EHEDG and 3A requirements. Approval is still pending. Heat transfer surface: 0.87 m <sup>2</sup> (9.4 ft <sup>2</sup> )
Capacity	Up to 3,000 or 5,000 l/h (6,600 – 11,000 lbs/h) depending on duty and temperature
Temperature	150°C (300°F)

### Advantages

- Shaft seals are standard APV pump type for easy maintenance.
- Product and service connections do not need to be disconnected for maintenance.