

Heat Exchangers



- Alfa Laval Heat Exchangers
- APV heat exchangers
- Contherm
- Heat Exchanger reconditioning program
- Tubular Heat Exchangers



Since 1964

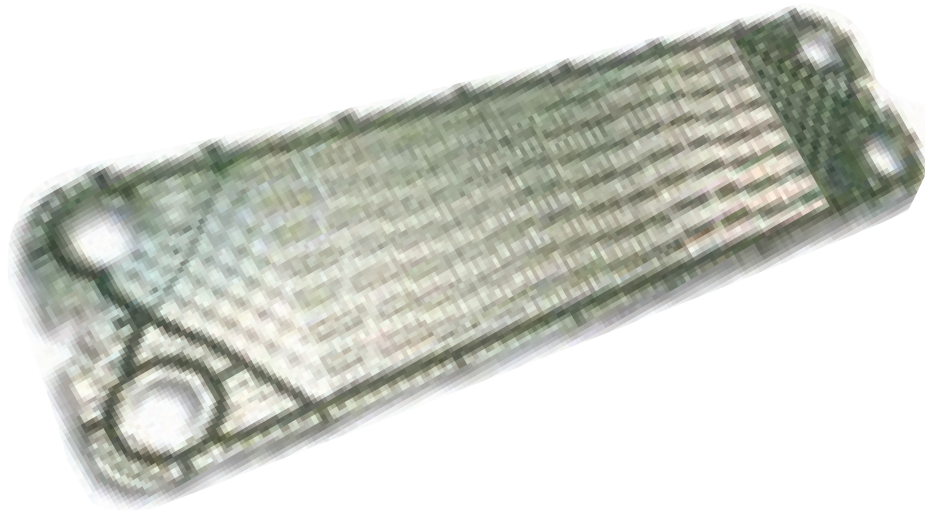
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Plate Heat Exchanger Reconditioning Service



Our Unique Five Step Process

1. Gasket removal is completed to allow thorough cleaning.
2. Chemical cleaning of plates to remove deposits from heat transfer surface.
3. Inspection for stress cracks and corrosion using a highly sensitive ultra violet dye penetrant.
4. Regasketing: new gaskets are fitted to the inspected plates.
5. Final inspection prior to shipping.



Do you have regasketing headaches?

Plate Heat Exchangers eventually require service to have gaskets replaced, to be thoroughly cleaned and to have the plates inspected for stress cracking or corrosion.

This service will ensure that the heat exchanger is restored to peak operating condition. This service is more than “regasketing”; we refer to it as “reconditioning”. Let Harco take your regasketing troubles away. You will have the confidence that comes from knowing that your plates have been reconditioned by experts with over 35 years of manufacturing and service experience.

At Harco Enterprises, we offer:

- > Fast turnaround on gasket reconditioning. (within two weeks for the average size order)
- > Tetra Pak- Alfa Laval Agent with the highest quality workmanship performed by trained technicians.
- > Approximately 1500 plates in stock (most common sizes available).
- > Exchange plates available.
- > Rental plates or plate packs available.
- > Harco Enterprises Quality Guarantee.

Plate Heat Exchangers for Sanitary & Industrial Applications



Tetra Plex gives you access to a wide range of compact plate heat exchangers that are especially designed for pasteurizing and other kinds of heating and cooling of liquid foods. No matter which you select, you will acquire a proven, reliable, hygienic and compact design that will carry out its tasks effectively and without problems for many years to come.

Tetra Plex C



Heat Transfer

for Every Purpose



HARCO
ENTERPRISES LTD
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Products and Concepts for Consistent Quality

Heat transfer is among the preeminent functions in today's food processing industry. Its assignment is to heat or cool sensitive foodstuffs to exactly the right temperature at exactly the right time, with the least possible effect on taste and consistency. It must satisfy today's high demands on hygiene and product safety. And it must effectively and carefully process foodstuffs that the consumers like, recognize and can depend on – day after day, year after year.

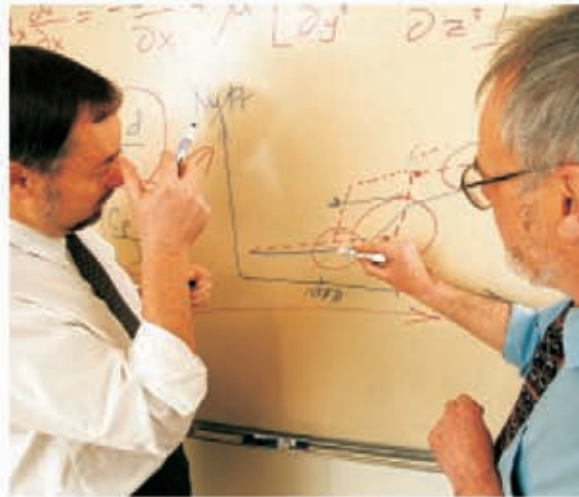
Thinking consistently about quality results not only in efficient and effective processes. Thinking about quality down to the tiniest detail is also the best guarantee of satisfied customers, long-term financial success and a proud trademark. The opposite scenario is the nightmare of every food processor...

Tetra Pak's products for heat transfer in the food processing industry satisfy the most exacting demands on quality, product safety, hygiene and operational reliance. We also take environmental responsibility by developing products providing high energy efficiency, low water consumption, minimized product losses and easy recycling. Continual research has created a solid technological platform featuring flexible, innovative and dependable design and construction solutions. A wide range of cost-effective products – plate, tubular and scraped-surface heat exchangers can be customized for every need and application.

Long and intimate cooperation with the food processing industry, and proximity to hundreds of markets throughout the world, have provided us with unique expertise, and a product database with information about how thousands of foodstuffs should be processed to obtain the optimal end result. When you choose a heat exchanger from Tetra Pak, you benefit from all of this knowledge. And that includes the calculation models we have created for precise dimensioning and optimization of our various products. You can be confident that we will help you find the heat exchanger that answers to your needs and desires. Of course we also assume the responsibility that our products function to your complete satisfaction in your facility, wherever in the world it may be.

All of this, combined with an excellent global service and support organisation, has made Tetra Pak one of the world's leading suppliers of heat exchangers and processing facilities for the food processing industry.

This brochure gives you a brief presentation of our products for heating and cooling food products. We have spiced the menu with representative "success stories" from different countries. Pleasant reading!



Continual research has developed a solid technological platform and solid knowledge of applications.



Equipment is constantly tested and improved in our product laboratories.



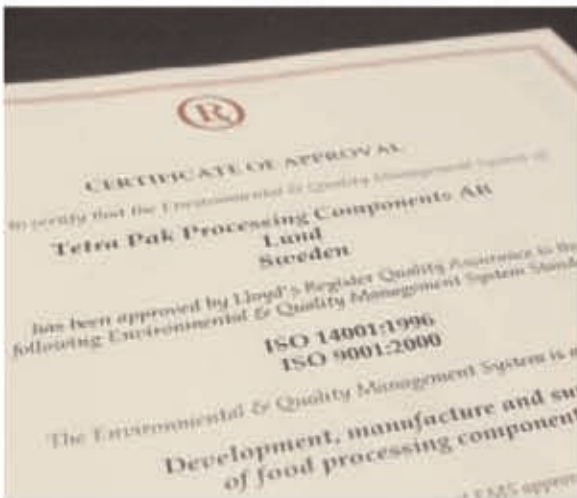
A high-tech and constantly monitored production leaves nothing to chance.



Our product database contains vital processing information about thousands of different foodstuffs.



A combination of knowledge and the latest technology provides state-of-the-art design.



The seal of approval from the leading certification institutions is a dependable guarantee of quality.



Many clients appreciate the opportunity to observe test runs in our customer laboratories.



Tetra Pak offers fast and secure deliveries all over the world.



Always near you: A smoothly functioning global service and support organization.

Tetra Plex®

– The Compact Solution



Tetra Plex gives you access to a wide range of compact plate heat exchangers that are especially designed for pasteurising and other kinds of heating and cooling of liquid foods. No matter which you select, you will acquire a proven, reliable, hygienic and compact design that will carry out its tasks effectively and without problems for many years to come.

Tetra Plex units are manufactured for Tetra Pak by Alfa Laval, the world's leading producer of plate heat exchangers. They represent a unique combination of proven technology and state-of-the-art design. With Tetra Plex heat exchangers you achieve very high levels of both product safety and production economy.

All Tetra Plex models have very high heat transfer abilities. This means that you can minimize temperature differences between product and service medium. You get gentle treatment of your product while simultaneously minimizing the risk of fouling. The excellent press depth with relatively few contact points yields longer running

times and the possibility to use thicker long life gaskets.

The plates' patented distribution pattern assures a smooth flow, which also makes CIP easier. The Tetra Plex range includes a wide selection of plates with different geometries and patterns for different applications. Many plates can be supplied in a choice of materials – stainless steel, SMO or titanium.

It is simple to disassemble Tetra Plex units for inspection. The glueless gaskets can be replaced quickly and easily on site, with the plates hanging in the frames. The food grade gaskets can be delivered in a range of materials for different applications and temperatures.

The Tetra Plex units are held together by sturdy, pressure graded frames with many smart, hygienic and labor-saving features. All frames offer great flexibility for expanding and rebuilding the plate heat exchangers.



Tetra Plex® C The top-of-the-line plate heat exchanger that has "everything." Superior and flexible design for easy handling and modification. Contains the famous and proven Clip-plates. Precision cut stainless steel frame. Plates can be supplied in alternative materials for particularly challenging tasks. The ultimate plate heat exchanger for liquid foods.



Tetra Plex® CW Same as Tetra Plex C but with WideStream plates. The number of contact points between the plates is minimized, resulting in long operating times when handling liquids containing pulp and fibers.



Tetra Plex® CD A plate with double walls combining good heat transfer with protection against leakage. (Not available on all markets.)



Tetra Plex® M The cost-effective frame design makes this a very competitive alternative for heating, cooling and some pasteurizing duties. For working pressures up to 10 barg.

Gentle Treatment Provides the Best Yogurt

The cooling of natural yogurt is a process requiring great care to avoid destroying its fine consistency. The perfect approach has been found at the Gefleorten Dairy Center in central Sweden.



The Gefleorten Dairy Association dates back to 1933. This is a small-scale operation, dedicated to high-quality products. Most of the customers are to be found on the local market, but the company is also involved in subcontract work for other dairies. One of its most important products is yogurt.

Yogurt is fermented at a temperature of 43°C. When it is subsequently to be cooled, the process must be handled carefully in order to maintain the fine consistency of the yogurt. This critical cooling process at the Gefleorten Dairy Center is managed by two plate heat exchangers with Clip-plates. Each of them has a capacity of 15 000 liters per hour.

"Cooling yogurt is a sensitive process," says the dairy's product manager Hans Wickström. "If it gets too cold, it easily breaks down. Besides, we have decided to produce a natural yogurt, with no additives of thickeners or stabilizers, and then the process is particularly sensitive. With the Tetra Plex plate heat exchanger we

can monitor the cooling very exactly. Our final product is actually so viscous and delectable that we could easily make it a little runnier and realize even better profitability, but we have chosen not to because we think our customers appreciate it just the way it is."

The secret behind the commendable results is the high thermal efficiency of the plate heat exchanger in combination with the gentle flow over the plates. The unique pattern of the Clip-plates means that the yogurt is distributed evenly and the heat is drawn off very effectively. The temperature difference between the yogurt and the cooling water can be kept as low as 1–2°C.

Ola Ericson is the technical director at the Gefleorten Dairy Center. He began working at the dairy in 1959, and it is he who has been responsible for the automation of the dairy. For more than 40 years now, he has consistently chosen equipment from Tetra Pak.

"Tetra Pak has served as a supplier, but also as a sounding board for different kinds of technical problems," says Ola Ericson. "This means that, over the years, we have had access to a level of processing expertise that would have been beyond the means of a small company like ours to put together on our own."



Tetra Spiraflo®

– One for Every Liquid Food



Tetra Spiraflo is a range of tubular heat exchangers that provide effective and gentle solutions for pasteurisation and other types of heating and cooling of all kinds of liquid foods. Its unique modular design means that Tetra Spiraflo heat exchangers can be customized to handle an extensive range of products and applications in the food industry. The modules' design, materials and finish satisfy the strictest standards of hygiene and actively contribute to high product safety. The Tetra Spiraflo heat exchanger is designed to eliminate the risk of inter-mixture between product and medium.

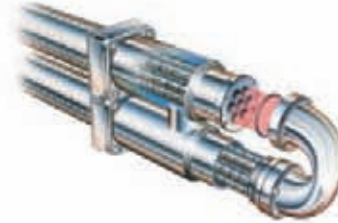
Tetra Spiraflo heat exchangers permit the free flow of product with very low fouling, and hence long, often extremely long, running times. This makes Tetra Spiraflo heat exchangers ideal for applications involving round-the-clock processing.

CIP is easy and effective. Maintenance and service costs are low. And the same heat exchanger can often be employed for several different duties.

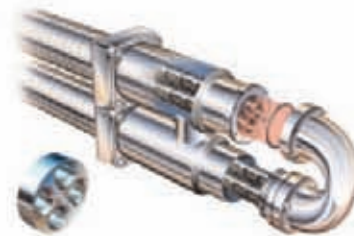
Taken together, these characteristics contribute to greater productivity and lower overall expenditures.

Every detail in a Tetra Spiraflo heat exchanger is based on well-known and proven technology, but the finished unit also comprises many unique features. One good example is the floating end design that eliminates the risk of stress corrosion and thermal expansion cracking – two problems often associated with welded tube designs. The floating end design also facilitates both unit assembly and opening the unit for inspection of the media side – the tube bundles are easily withdrawn from the shell.

Another feature is the option of having the Tetra Spiraflo heat exchanger delivered with tubes in alternative materials. Tubes made of SMO reduce the risk of corrosion when processing aggressive products, e.g. those with a high salt content.



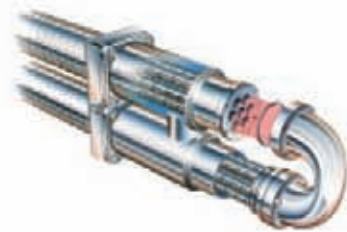
Tetra Spiraflo® MT Multitube This tubular heat exchanger handles a wide range of liquid foods, including those containing small particles. The Multitube delivered to you has been customized for your specific product and process, including smooth or corrugated inner tubes available in different diameters.



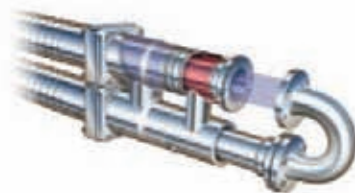
Tetra Spiraflo® FT Fibretube The Fibretube is specially designed for fruit juices with a very high content of pulp and fibres. The end plates of the Fibretube have rounded inlets to prevent long fibres from clinging to the edges between inlets.



Tetra Spiraflo® MT Monotube The Monotube is a tubular heat exchanger specially designed for gentle treatment of products containing large particles. As the name implies, a single product tube lies within the media shell.



Tetra Spiraflo® MTR & MTRF These regenerative tubes are designed to permit energy savings via direct product-to-product heat recovery. Also handle liquids containing particles, pulp and fibres.



Tetra Spiraflo® MTC The MTC is designed to facilitate gentle and uniform yet effective heat treatment of high viscosity products. The product flows through a narrow gap with media on both sides.

Tetra Spiraflo® MT Pilot The Spiraflo range also includes this heat exchanger suitable for pilot runs and small-scale production.



Tetra Spiraflo® CIP & Water Heater This compact and reliable CIP heater is very easy to install and requires minimal maintenance.

Pasteurisers for a Growing Market

The international market for Not From Concentrate (NFC) orange juice is growing briskly. Consumers nowadays expect their juice to taste freshly squeezed regardless of where in the world it is purchased. This has resulted in greater technical demands on so-called soft pasteurisation and aseptic transports. The leading brand owners in this field have invested very heavily in customer confidence. And that is why they turn to the best suppliers.



A very large volume of the juice supplied to the world's leading brands comes from Brazil. And it is in Brazil that we find one of the world's largest processing facilities for orange juice – Citrusuco. Every day during the peak season, the company's plant in Matão, outside São Paulo, processes thousands of tons of oranges, many of them from their own orchards. The quality control is exacting. Only the very best, perfectly ripe oranges are used for NFC orange juice.

Citrusuco supplies the world market with NFC orange juice. The task is to see to it that the juice maintains a high and consistent quality, and that it tastes just as good when it reaches the consumer as it does when it is squeezed at the Matão plant.

This emphasis on quality, of course, entails very high demands on knowledge, logistics and equipment. And from

the very outset, in 1963, Citrusuco has allocated major resources to developing and refining the technology for producing and distributing orange juice. The greatest challenge so far has been to develop the technology for aseptic transfer of NFC in bulk. This was accomplished in close cooperation with Tetra Pak, which was also designated to supply all the equipment for aseptic processing, including a large number of pasteurisers.

NFC orange juice is a sensitive product that must be handled with care to preserve its good taste. With Tetra Spiraflo tubular heat exchangers in their pasteurisers Citrusuco can control the process with precision, and achieve the exactly right end product. The choice of Spiraflo with its fibre tubes results in very long operation times. The tubes are also easy to CIP and to dismantle for inspection or gasket replacement if it should be necessary.

The pasteurisers in Citrusuco's facilities in Matão have an impressive capacity. The increasing demand for NFC orange juice has meant expanding them time after time. That's no problem for Tetra Spiraflo – the tubular heat exchanger has a modular construction, so it can relatively easily be expanded if necessary. At present, three pasteurisers are processing enormous volumes of orange juice every hour, and another expansion is underway. Citrusuco has also chosen Tetra Spiraflo heat exchangers for its facilities in Santos and Belgian Gent.



Contherm®

– For the Viscous, Sticky, Chunky and Crystalline



Contherm is a cylindrical scraped-surface heat exchanger designed for heating or cooling viscous, sticky, chunky and crystalline products. Treatment takes place entirely without air contact. Unlike traditional batch processing, Contherm provides gentle and uniform heating or cooling of even the most demanding products to the desired temperature. The result is high and consistent product quality. The possibility of running a continuous process also means a great reduction in energy consumption.

The vertical construction is well thought through – Contherm requires little floor space and is easy to inspect and clean, even though it handles demanding products.

Contherm, manufactured for Tetra Pak by Alfa Laval, can be delivered in four sizes and offers a number of features that can be adapted to different applications. For example, blades and cylinder walls can be delivered in different designs and materials according to the products to be processed.



In a Contherm, the product is pumped into the lower end of the heat exchange cylinder. As it flows through the cylinder, it is continuously agitated and removed from the cylinder's precisely finished walls by the scraping blades. Heating or cooling media flow in the annular space between the heat exchange cylinder and the insulated jacket. Contherm can also be delivered as Convap, consisting of a scraped-surface heat exchanger and an evaporator vessel. This is the ideal system for concentrating viscous and sticky products.

“Perfect for Demanding Products”

Cooking rice pudding on an industrial scale is probably one of the most difficult challenges to confront a heat exchanger. Procordia Food in Örebro in southern Sweden has chosen the Tetra Desserto Line, a process line containing Contherm – a scraped-surface heat exchanger that runs in a continuous process. This provides great advantages over traditional batch processing.



Swedish Procordia Food is part of the Norwegian Orkla concern, one of Scandinavia's leading food enterprises. Orkla is behind many of the top-ranking trademarks for foods in the Nordic countries. The Procordia Food plant in Örebro produces convenience foods and various kinds of eat-as-you-go-products and desserts.

One of Procordia Food's hit products is Risifrutti, a dessert product which consists of rice pudding and creamed fruit in a twin cup. The product was launched in the early 90s and quickly established a niche on the market. The big demand for Risifrutti and the company's other dessert products prompted

Procordia Food to invest recently in an entirely new process line which was commissioned in 2001.

"This line was built by Tetra Pak and designed to accommodate the highest demands on hygiene and gentle treatment of the products," says Christer Norefors, product manager at the Örebro facility. "Tetra Pak's processing expertise combined with the unique Contherm heat exchanger has made it possible to run the process continuously, which provides great advantages compared to a batch-wise process."

In the Tetra Desserto Line, a pre-heated milk mixture is blended with rice and pumped into a Contherm, where it is heated to ca 100°C. At that temperature the grains of rice swell to the desired plumpness in a holding tube. Next, the rice pudding is sterilized in another Contherm at a temperature of ca 130°C. After cooling – that, too, managed by Contherm heat exchangers – the rice pudding is ready for aseptic packaging. Procordia Food decided on Contherm because of its excellent performance in processing high-viscosity products, products containing particles, and products that tend to foul during heating. Its high agitation of the product ensures very efficient heat transfer. And the scraping action of the blades keeps internal surfaces clean and free from deposits, even when extremely sticky products are processed. Contherm is also very easy to handle and requires minimal supervision.

"A couple of hours' planned shutdown per week is sufficient," says Thomas Wretlund, who works with process and maintenance issues at Procordia Food in Örebro.



Find Your Heat Exchanger

Regardless of your heat transfer needs and the products you want to process, Tetra Pak offers a tailored heat exchanger that will do the job. Effectively and trouble-free.

When you choose Tetra Pak as your supplier you automatically benefit from our extensive knowledge about applications, including a database with vital processing information on thousands of different foodstuffs.






The following pages will give you an overview of which heat exchangers are best suited for your specific applications.

Tetra Pak and the Environment

Tetra Pak takes environment work very seriously. The most significant environmental impact of our machinery and equipment is in its performance when in use. Consequently, this is the main focus of our environment work.

In our development work we utilise a process called Design for Environment, which aims at reducing energy and water consumption, minimising loss of food product, controlling what materials are used in our equipment and enabling separation and reuse of materials at the end of the equipment lifetime.

The manufacturing of our machinery and equipment, both in-house and at our suppliers', also comprises continuous work to minimise environmental impact. This work is performed in line with our environment management system, certified according to ISO 14001.

	Tetra Plex®				
					
SEGMENTS AND APPLICATIONS	C	CW	CD	M	MT Multitube
DAIRY					
Milk cooling/heating	●		●	●	
Milk/Cream pasteurisation	●		●	●	●
Milk/Cream UHT	●				●
Cultured milk cooling	●				
Concentrated milk	●				●
Whey pasteurisation	●		●	●	●
Ice cream mix pasteurisation	●				●
BEVERAGE					
Clear juice/nectar/still drink	●	●	●	●	●
Juice/nectar/still drink with pulp & fibre < 5 mm		●			●
Juice/nectar/still drink with pulp & fibre < 15 mm					●
Juice/nectar/still drink with pulp & fibre > 15 mm					●
Clear juice concentrates	●		●	●	●
Juice concentrates with pulp & fibre		●			●
Tomato/vegetable juice					●
Carbonated Soft Drink	●		●	●	●
Soy milk/drinks	●		●		●
OTHER LIQUID FOOD					
Tomato products	●				●
Fruit preparations					●
Fruit purees	●				●
Fruit mash					●
Soups & Sauces	●				●
Desserts	●				●
Liquid egg products	●				●
Products with big particles					●
Sticky products					●
UTILITIES					
Heating of CIP	●			●	
Water heating/cooling	●			●	
Media heating/cooling	●			●	
MAXIMUM CAPACITY					
Pasteurisation, l/h (low-viscous products)	65 000	30 000	65 000	80 000	50 000
Heating/cooling, l/h (low-viscous products)	65 000	30 000	65 000	100 000	80 000
Water, l/h	130 000	75 000	130 000	200 000	120 000
MAX WORKING PRESSURE, BAR(G)					
	21	7	10	10 (19)	80

- Recommended
- Suitable

