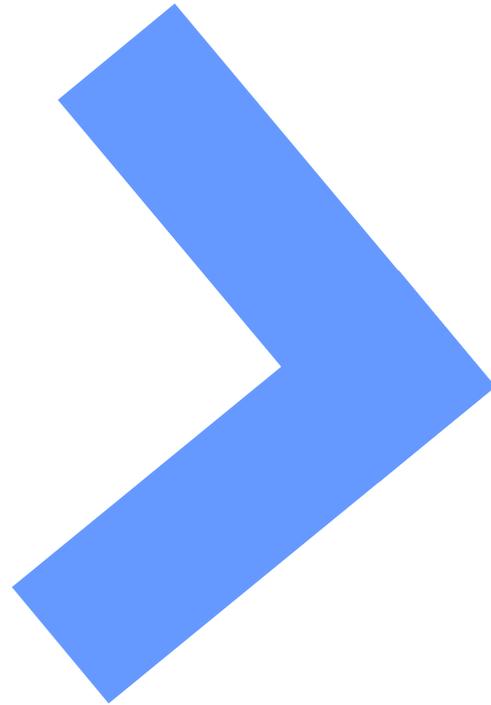


## DAIRY, FOOD & BEVERAGE HEAT EXCHANGERS





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## INTRODUCTION



Since 1981 Fluid Dynamics has specialised in Heat Exchangers for all industries & applications including Dairy, Food & Beverage.

In our well-equipped Australian factory we manufacture, refurbishment, test, clean, service and distribute a wide range of heat exchangers from corrugated & smooth shell & tube to gasketed & brazed plate.

To ensure you get the latest equipment and the very best service and quality, Fluid Dynamics has formed valuable partnerships with manufacturers of some of the finest heat exchangers in the world including the UK, Europe, America and Asia.

We understand the needs of the Dairy, Food & Beverage industry and can assure you of friendly service, top quality equipment and a fast and effective response.

The Dairy, Food & Beverage industries are constantly changing with new challenges always emerging.

Fluid Dynamics understands that manufacturers and processors of are always striving to deliver competitively priced, environmentally acceptable, safe, hygienic and tasty products with minimal impact on the environment—and so are we.

We relish the challenges of providing high quality and efficient heat transfer solutions for your needs. No task is too small and rarely is it too big.

Fluid Dynamics provides solutions for heat transfer and processing for the Dairy, Food & Beverages industry.

You can rely on us for expert advice and high quality equipment.

## STAINLESS STEEL TUBULAR

### DOUBLE TUBE HEAT EXCHANGER HYGIENIC DESIGN

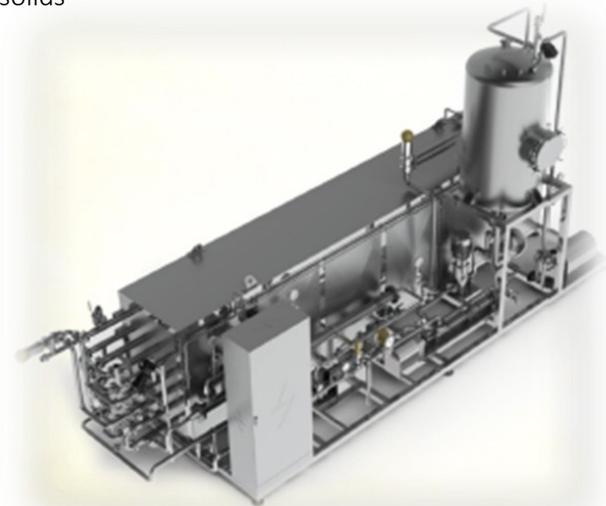
<b>Materials</b>	Shell side - AISI 304
	Tube side - AISI 316L
	Other materials available on request
<b>Connections</b>	Shell side - DIN Flange
	Tube side - Tubeplate Flange
<b>Design Conditions</b>	P design - 10 barg
	T design - 185°C
<b>Areas</b>	1.4 m <sup>2</sup> to 18.4 m <sup>2</sup>
<b>Applications</b>	Low or high viscosity fluids Fluids containing fibres or other solids



### PASTEURISER SERIES

The Pasteuriser Series is designed to subject the product to a high temperature for a very short time.

This very efficient process allows optimal sterilisation and ensures desired results are obtained while minimising undesirable effects such as loss of organic and nutritional properties.



### MULTI TUBE HEAT EXCHANGER

<b>Materials</b>	Shell side - AISI 304
	Tube side - AISI 316L
	Other materials available on request
<b>Connections</b>	Shell side - Flanged
	Tube side - Clamp
<b>Design Conditions</b>	P design - 10 barg
	T design - 185°C
<b>Areas</b>	0.4 m <sup>2</sup> to 1.8 m <sup>2</sup>
<b>Applications</b>	Low or intermediate viscosity fluids Industrial applications CIP heating



## COOLING SERIES

Our Cooling Series units are designed to work in continuous mode & are normally used in the final stage of the thermal process to reduce the temperature of the product prior to packaging.

The thermal parameters in the process can be controlled in a precise and efficient manner.

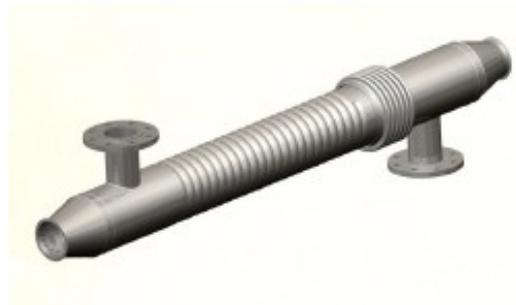
Our coolers are manufactured with corrugated tube technology and provide double the efficiency of smooth tubes.

This, in turn, allows for smaller systems, reduced treatment times, saves energy, reduces costs and preserves taste and other properties of the product.



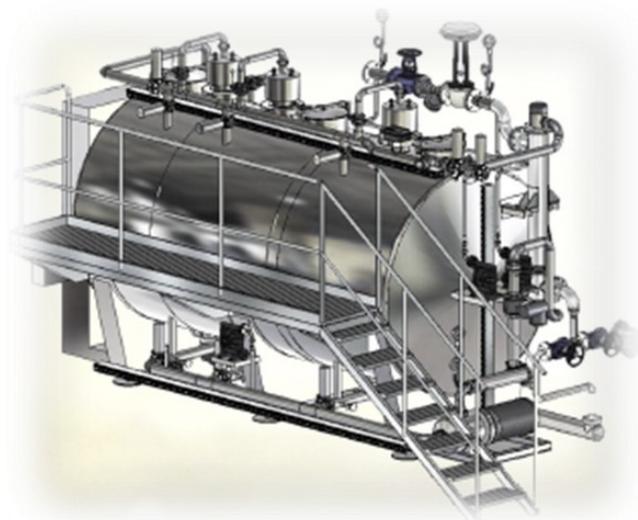
## MULTI TUBE HEAT EXCHANGER HYGIENIC DESIGN

<b>Materials</b>	Shell side - AISI 304
	Tube side - AISI 316L
	Other materials available on request
<b>Connections</b>	Shell side - Flanged
	Tube side - Hygienic clamp
<b>Design Conditions</b>	P design - 10 barg
	T design - 185°C
<b>Areas</b>	1.4 m <sup>2</sup> to 18.4 m <sup>2</sup>
<b>Applications</b>	Low to intermediate viscosities
	Food industry applications
	CIP heating



## CIP - CLEANING IN PLACE SERIES

Our CIP Series is designed to eliminate from the process system organic residues such as precipitated proteins, carbohydrates, fats and many other elements thus removing a nutritional base upon which bacteria grow and which form precursors of bio-corrosion.



## SCRAPED SURFACE HEAT EXCHANGERS

### Unicus

The Unicus is a tubular heat exchanger with scraper bars in each tube that move in a back and forth manner. Ideal for highly sensitive fluids, such as food industry products, with whole particles.

The gentle scraper movement provides efficient heat transfer without damaging the product's integrity for all hygienic and industrial applications.

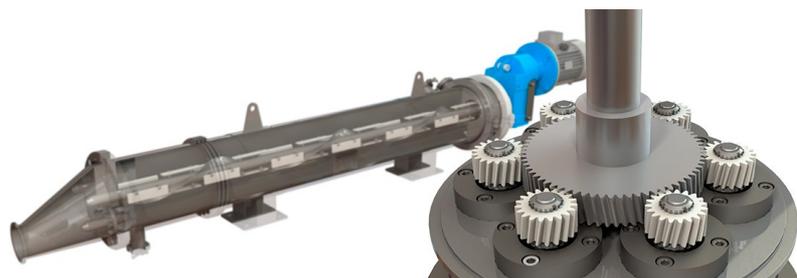
Highly scalable with heat transfer areas ranging from 0.7 to 120 m<sup>2</sup> in one heat exchanger makes the Unicus ideal for very large applications, such as evaporation of environmental waste for highly fouling fluids.



### Rotex

The Rotex has been developed for applications where higher levels of product mixing are required due to high viscosities. It is a rotary scraped surface heat exchanger with scraping velocities up to 300 rpm.

Unlike other rotary scraped surface heat exchangers the Rotex can be fitted with several heat transfer tubes in one single shell. This means more heat transfer area per module with significant capital and operational cost savings.



## FD-Plate™

### GASKET PLATE

Not only can Fluid Dynamics supply its own high quality FD-Plate™ it also can supply plates and gaskets to suit almost any brand of Gasket Plate heat exchanger including Alfa Laval, APV, GEA & Sondex.

With solid stainless steel frames our gasket plate heat exchangers are ideal for use in all hygienic applications.

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### SOLID STAINLESS STEEL

Fluid Dynamics' Stainless Steel Plate Gasket Heat Exchangers have solid stainless steel frame plates unlike many others whose plates are carbon steel with a thin coating of stainless steel.

Using solid stainless steel frame plates ensures there is no de-lamination between metals and guarantees maximum hygiene and long-life of the unit.

Ideal for all hygienic processes including:

- Cooling
- Heating
- Pasteurisation:



## GENERAL DUTY PLATE HEAT EXCHANGERS

When a more economical heat exchanger can be used, Fluid Dynamics' standard gasketed plate heat exchanger is ideal. Using carbon steel frame plates with our high quality stainless steel, duplex alloys or titanium plates, these units give excellent services including:

- High thermal efficiency
- Effective heat transfer
- High performance
- Versatile & compact design
- Low installation cost
- Easy dismantling and cleaning
- Environmental efficiency



## GASKETS

Fluid Dynamics can supply aftermarket gaskets for all brands of plate heat exchangers with well over 600 different gaskets available.

Through our international partnership with one of the world's leading gasket manufacturers, Fluid Dynamics has access to the widest range of aftermarket plate gaskets available with:

- Widest evolving range of products on the market
- European design, technology and quality
- Advanced supply chain capability
- Very competitive pricing
- Huge production capacity
- Short lead times



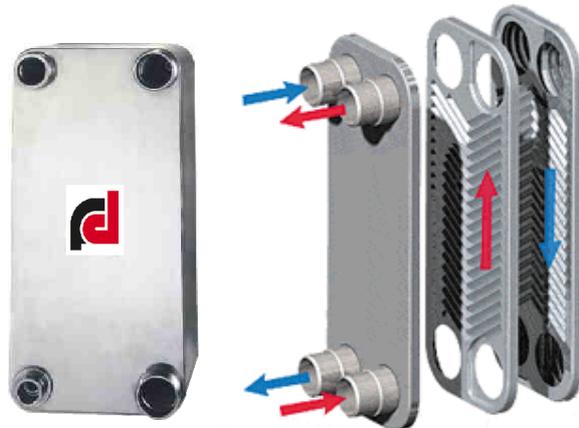
## FD-Plate™ BRAZED PLATE

Fluid Dynamics has one of the most comprehensive ranges of brazed plate coolers. In the Summary Chart you will find those units that are ideally suited to use in the Dairy, Food & Beverage industry.

Fluid Dynamics' FD Brazed Plate Heat Exchangers consist of corrugated chevron plates with various brazing materials available for different working conditions.

The high quality of FD Brazed Plate heat exchangers ensures that they are capable of working in high pressure and high temperature environments subject to model selection.

FD Brazed Plate heat exchangers come in a wide range of applications, sizes and brazing materials to ensure the right solution for your needs.



## Features

- Long life durability
- Corrosion resistance
- High thermal transfer efficiency
- Compact
- Easy installation
- Proven & reliable quality
- Flexible flows & temperature monitor option



## BRAZED PLATE SUMMARY CHART

	FD-K	FD-R	FD-Z	FD-C	FD-E/F	FD-H	FD-I
<b>FEATURES</b>	Standard	High Heat Transfer R410A	Diagonal Flow Large Heat Capacity High Flow Rate	Super High Pressure R744 (CO2) Up to 140 bar	Low Pressure Low Flow Rate Water to Water	High Temp Fluid	Impact Pressure & Thermal Shock Resistant
<b>Maximum Working Pressure</b>	45 bar	45 bar	45 bar	140 bar	10 bar	10 bar	30 bar
<b>Brazing Material</b>	Copper/Nickel	Copper	Copper	Copper	Copper	Nickel	Copper
<b>Max. Working Temperature (°C)</b>	200	200	200	200	200	~ 650 to ~ 900	200
<b>APPLICATIONS FOR DAIRIES</b>							
Refrigeration Storage System	●	●	●	●			
Chiller	●	●	●				
Process Cooling	●						
Waste Heat Recovery	●		●				
Boilers	●				●		●
Pre-Cooler / Pre-Heater	●	●	●	●			
Evaporator / Condenser	●	●	●	●			

## PREVENTION OF WATER HAMMER

Water hammer occurs when the flow of non-compressible fluids in pipes suddenly changes its velocity. The most common cause is when the rapid closure of a solenoid valve causes sudden pressure in the pipes. This may damage the valve, heat exchanger and other equipment on the circuit. To avoid water hammer installation of pressure suction pipes, water hammer arrestors, air chambers etc. are highly recommended.

## CLEANING

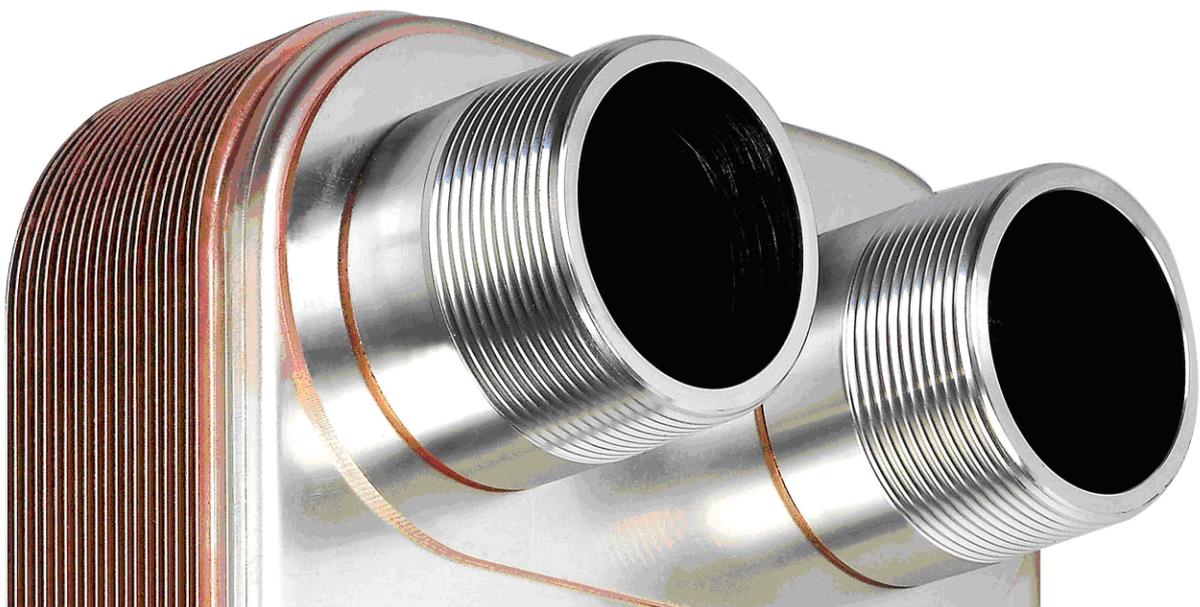
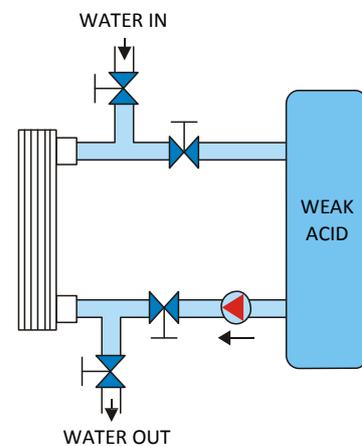
Ultrasonic cleaning, using the correct chemicals and procedures, is the ideal way to clean all plate heat exchangers. It is safe and does not damage the plates.

Fluid Dynamics has one of the most modern, and possibly biggest, ultrasonic cleaning systems in Australia and is happy to answer all your questions on the process.

## BRAZED PLATE CLEANING

Urgent cleaning of Braze Plate heat exchangers may be carried out by using a weak acid (5% phosphoric, nitric or oxalic acid) and back flush to remove soft debris inside the unit (as shown in the diagram).

The flow rate of the cleaning solution should be at least 1.5 to 2 times the normal flow rate for at least 30 minutes. After cleaning, thoroughly rinse the heat exchanger with large amounts of clean water to purge any remaining acid solution.



## PISTON PUMPS

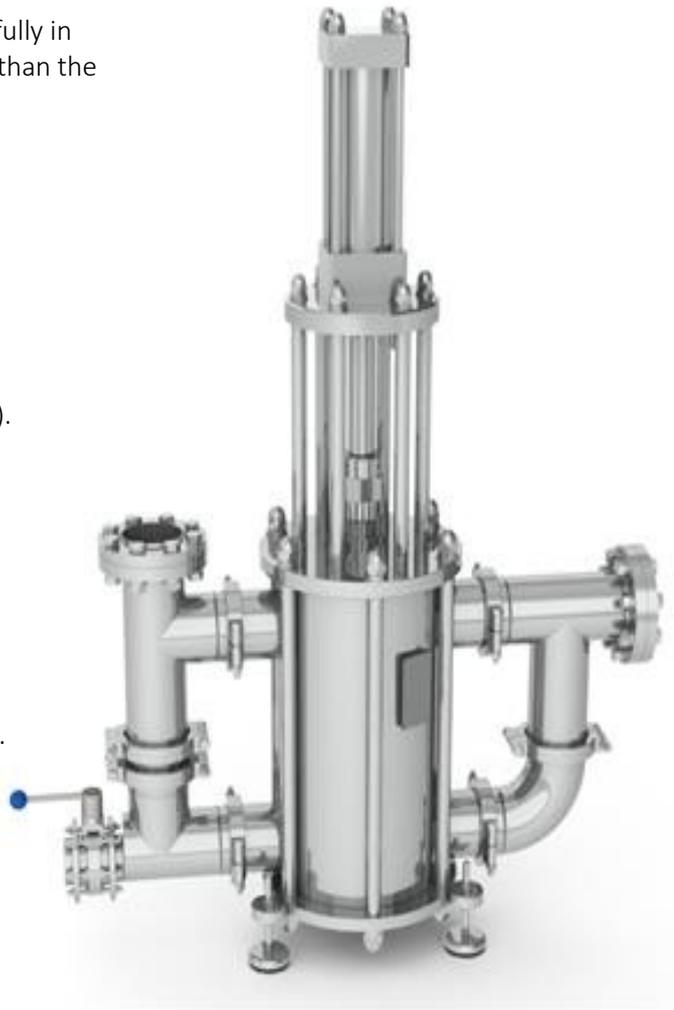
Pumping without destroying product integrity is as important as the heat exchanger that comes after the pump.

Fluid Dynamics' piston pumps can handle very delicate and viscous food stuffs and can pump up to very high pressure without damaging the food particles.

The pumps can also be applied very successfully in heavy duty applications for industries other than the food industry.

### Features

- Does not break the product.
- Delivers high flow rates (up to 20 m<sup>3</sup>/hr).
- Allows high pressure drop (20 bar).
- Can work under vacuum.
- Is self-priming.
- Can work empty (without product).
- Requires few spare parts.
- Has no seals in contact with the product.
- Hygienic.
- Can work at high temperatures (100 °C)
- Few number of valves per volume unit.



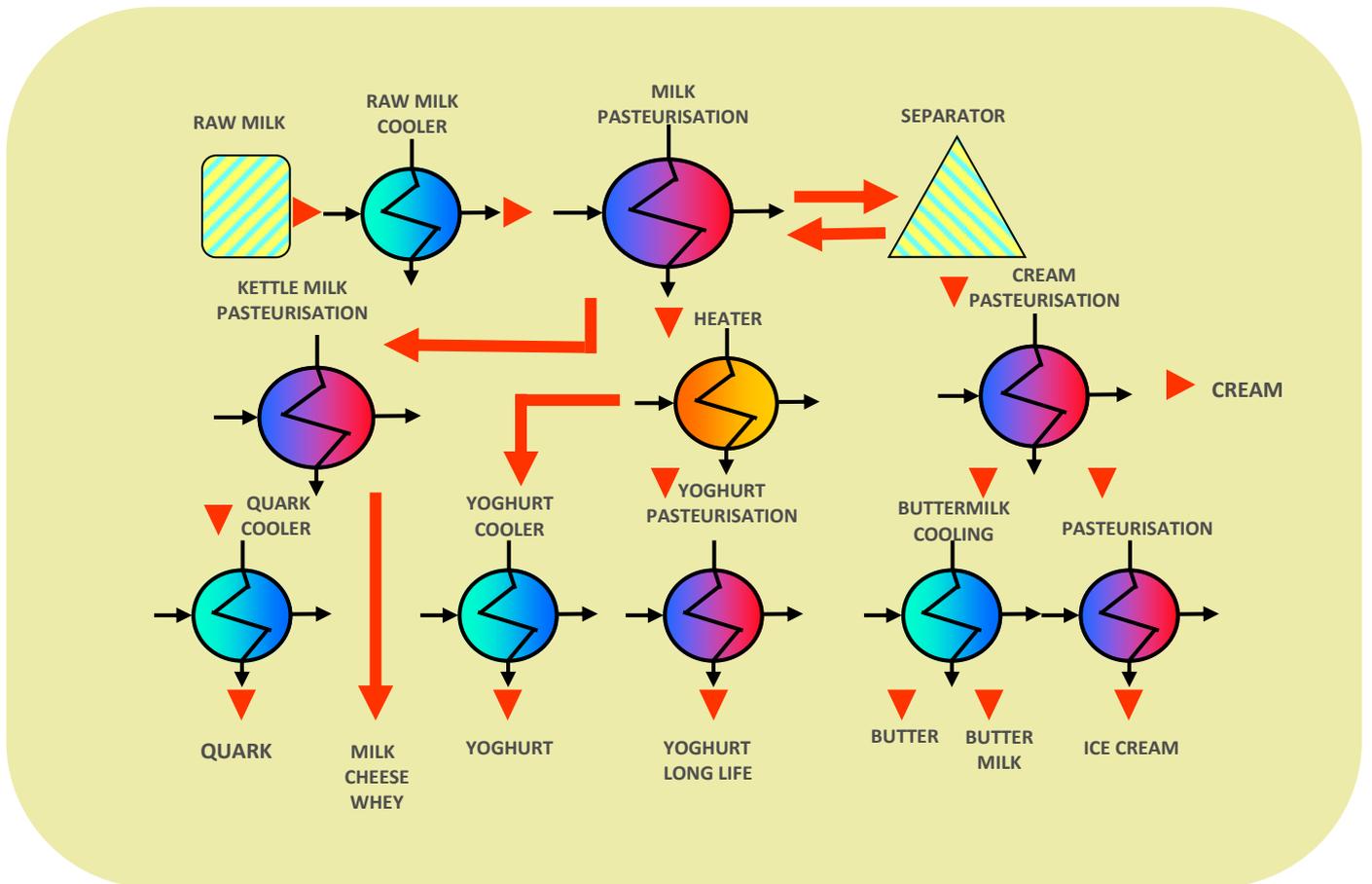
## DAIRY

Fluid Dynamics has access to a wide range of heat exchangers all of which are ideal for hygienic applications including Dairy.

Because Fluid Dynamics has such flexibility at its disposal we are not locked into any particular heat exchanger type and you can be confident that we will offer the best possible solution for your needs.

We have a full range of high quality stainless steel gasketed plate, brazed plate and corrugated tube solutions at our disposal.

Fluid Dynamics' flexibility is unsurpassed in hygienic heat transfer solutions for processing volume as well as temperature programmes.

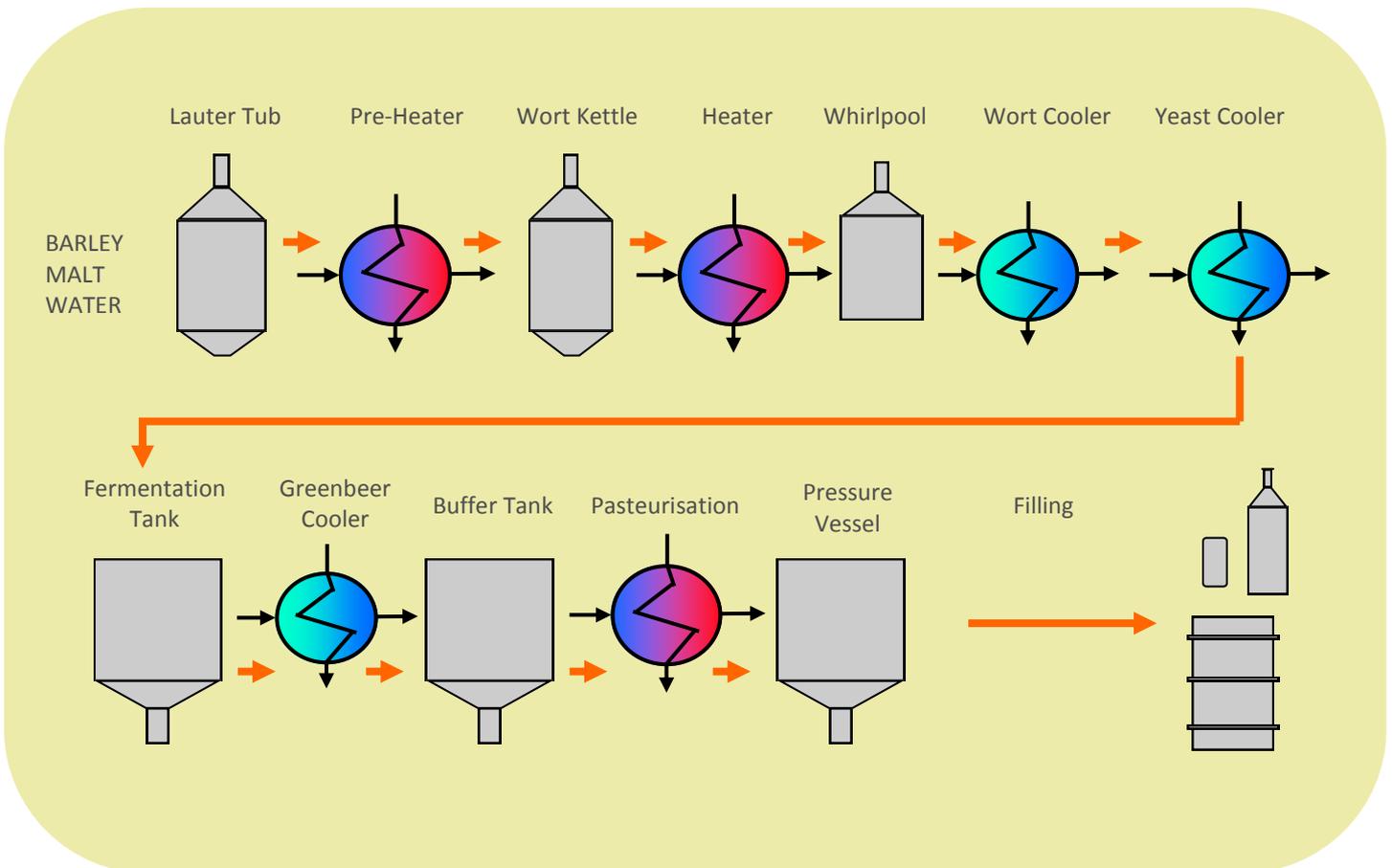


## BREWERY

Fluid Dynamics has access to a full range of heat exchanger types and has the right solution for the thermal treatment of brewery products including wort, yeast and beer.

Our extensive range of thermal solutions includes stainless steel corrugated tube heat exchangers as well as gasketed plate and brazed plate heat exchangers.

Whether you need to preheat, boil, pasteurise or cool wort, yeast, green beer, water or beer, we have the right solution.

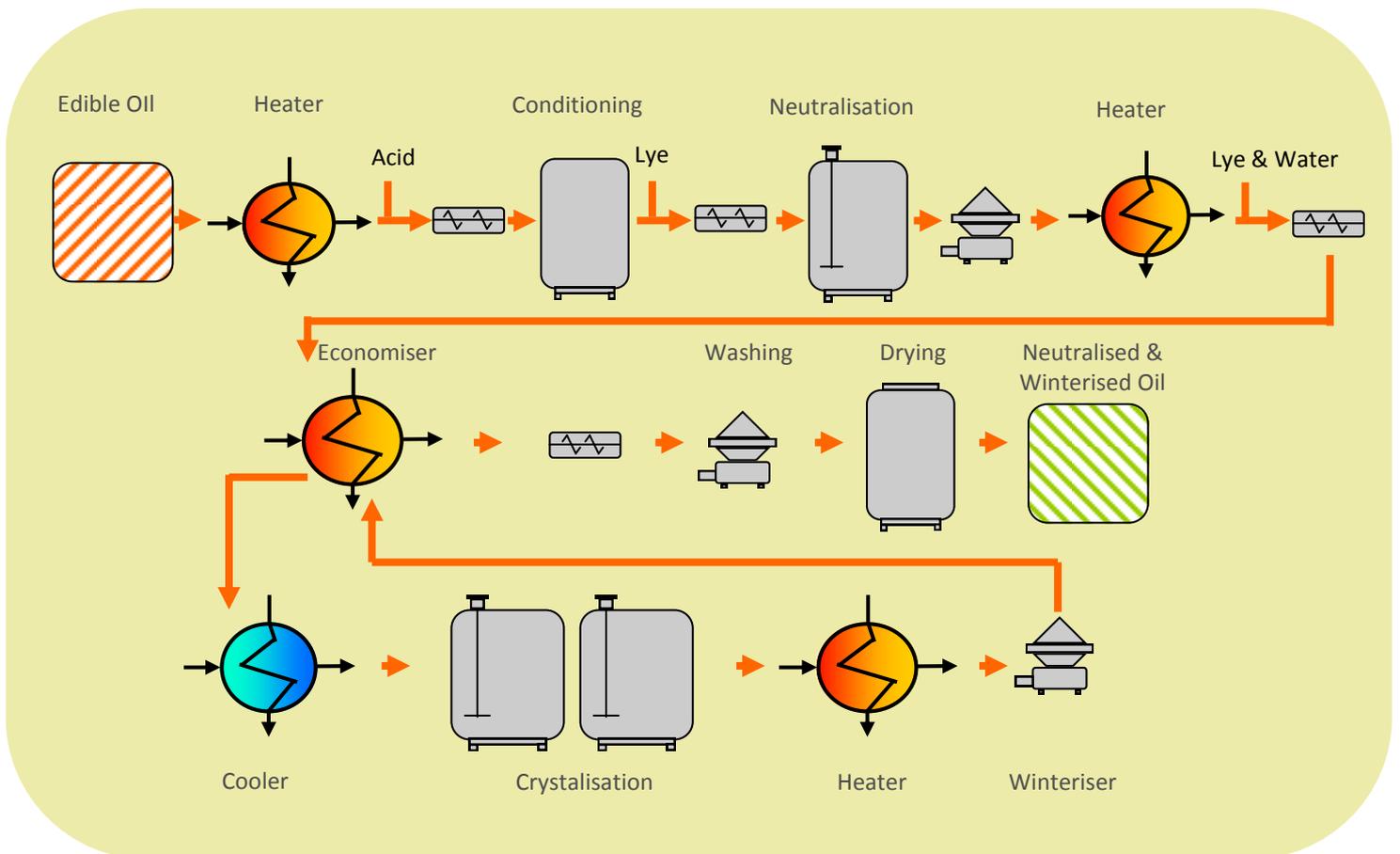


## EDIBLE OILS

Fluid Dynamics' flexibility allows us to offer solutions to the edible oil industry to support neutralisation, de-gumming, winterisation, bleaching and deodorisation.

Proper thermal treatment of edible oils can improve taste values and help preserve the integrity of the oils' qualities including vitamins.

We are not limited to the type of heat exchanger we can recommend and delight in providing sensible and imaginative thermal solutions using a range of products at our disposal.

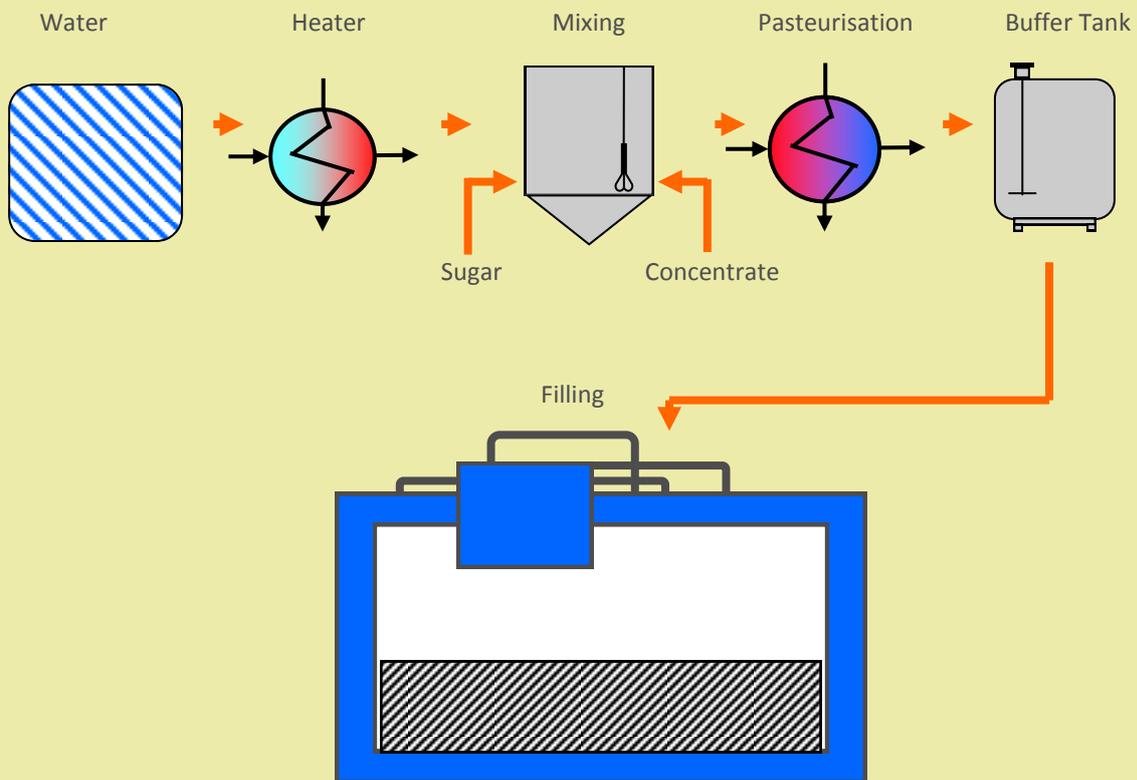


## JUICES & SOFT DRINKS

No matter the viscosity of the product that you need to treat, Fluid Dynamics will have a thermal transfer solution for treatment and pasteurisation of juices, soft drinks and other beverages.

As Fluid Dynamics is not limited to one type of heat exchanger, we can offer a vast range of solutions using either corrugated tube, gasketed or brazed plate, finned tube or a combination of these units to provide a complete tailored solution depending on your resources and needs.

For the efficient preservation of beverages including juice, fruit concentrates, sugar solutions, tea and soft drinks, contact Fluid Dynamics.



## SERVICE

Fluid Dynamics services all the products it sells including the units featured in this brochure.

In our well-equipped Australian factory we have the equipment necessary to ensure that your heat exchangers get the best and quickest treatment.

From our state-of-the-art ultrasonic cleaning tank to our lathes, welders and testing equipment we can expertly refurbish, test and clean your heat exchangers.

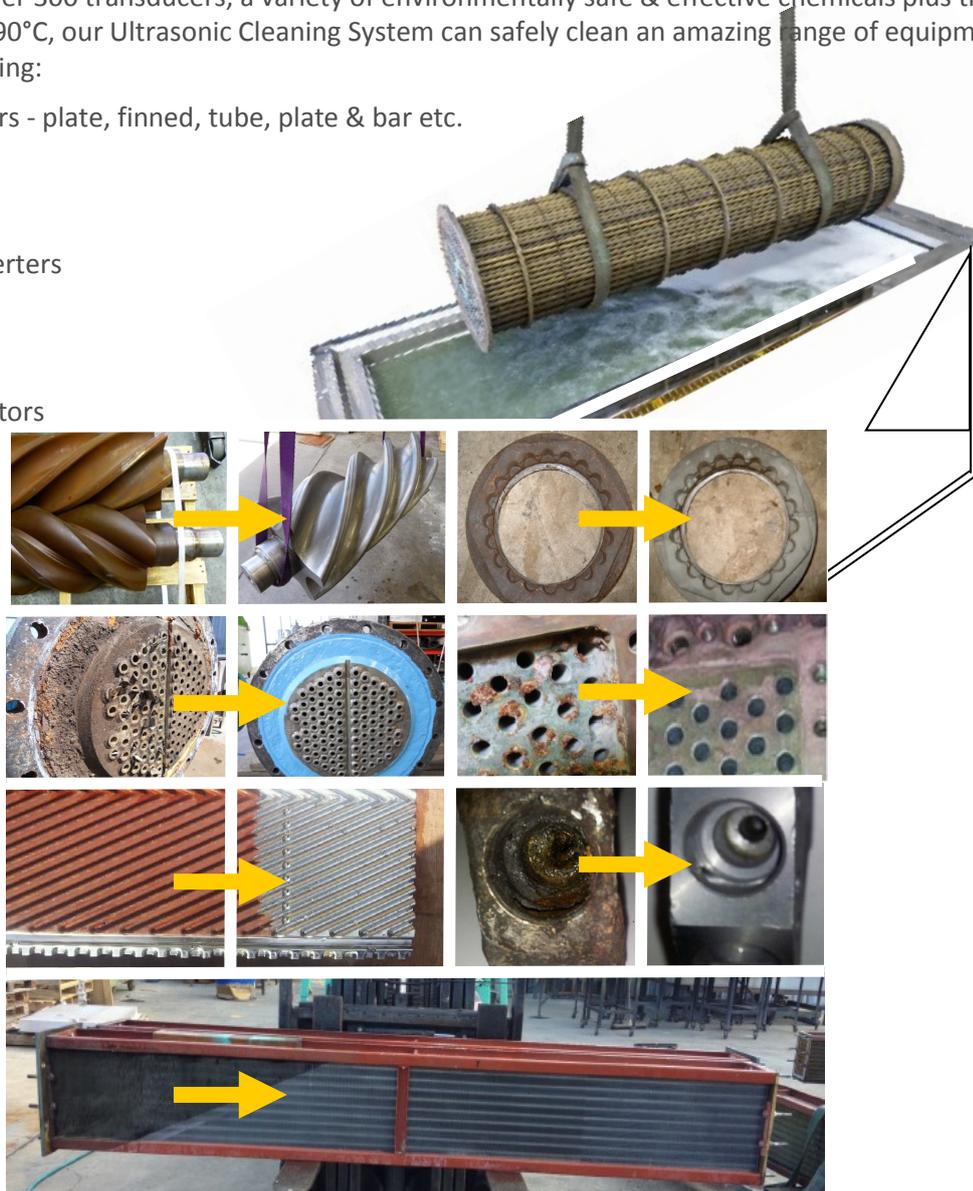
We also provide on-site service.

## The magic of ULTRASONICS

Fluid Dynamics has probably the largest Ultrasonic tank in Australia available to all industries.

Equipped with over 300 transducers, a variety of environmentally safe & effective chemicals plus the ability to heat the tank to 90°C, our Ultrasonic Cleaning System can safely clean an amazing range of equipment and machinery including:

- Heat exchangers - plate, finned, tube, plate & bar etc.
- Radiators
- Fuel tanks
- Catalytic Converters
- Filters
- Pumps
- Compressor rotors
- Engine parts
- Transmissions
- Valves
- etc. etc.



## A WORLD OF HEAT EXCHANGERS

Fluid Dynamics can assist you with all your heat exchanger needs including:

- Shell & Tube
  - FluidEX® Off the Shelf
  - Marine
  - Fail Safe™
  - Hybrid
  - Custom Build
  - Corrugated
    - Multitube Industrial
    - Multitube Hygienic
    - Annular Space
    - Tube in Tube
    - Exhaust Gas
- Scraped Surface Heat Exchangers
- Special Projects
- FD-Plate™
  - Gasket
  - Gasket - Fail Safe™
  - Brazed
  - Brazed - Fail Safe™
  - Fully Welded
  - Disc & Plate
- Fin Tube
- Coil Condensers
- Dry Air Coolers
- Adiabatic Coolers
- Air Cooled Condensers & Evaporators
- FluidAIR® Bar & Plate
- FT Range™ On Road / Off Road
- Heat Pumps
- Piston Pumps
- Design
- Custom Build
- Aftermarket
- Spares
- Ultrasonic Cleaning
- Testing
- Repair
- Refurbishment

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