



**Fluid Dynamics**

Heat Exchange Solutions since 1981

# Capability Presentation

Presented by: Mike Surrige - General Manager



# Capability

Fluid Dynamics Pty Ltd, an Australian owned and operated company specialising in heat exchangers since 1981, is certified ISO 9001:2015 and can design and verify to most compliance standards including:

API 661 norms; AS1210; ASME 'U' Stamp; PED etc..

In over 40 years of operation Fluid Dynamics has built an enviable reputation for being able to design, manufacture, supply, re-engineer, refurbish, clean and test a huge range of heat exchangers at its fully equipped facility.

We carry a large range of stock and equipment for even the most complicated of projects with our product range being constantly extended and updated to include the latest designs.

As we are not tied to any single brand we are completely unrestrained in what solutions we can offer – the best solution that suits our customers, not the 'solution' that suits the supplier

Our unique business model allows us to supply both OEM and aftermarket heat exchangers with custom designs, modifications, refurbishment, parts and service for almost any type of heat exchanger to suit our customers needs. Fluid Dynamics will always offer the best solution and the best quality at very competitive pricing - all backed up by a proud Australian company specialising in heat exchangers



# Heat Transfer

Fluid Dynamics has remained at the forefront of heat exchanger technologies since 1981. From our base in Melbourne, we offer the following services to our very broad customer base:



Fabrication & Service  
Facility



Ultrasonic Cleaning  
System



In House Inspection  
and Testing



Design, Sales and  
Service for new,  
replacement & rebuild  
of all heat exchangers



Accreditation to ISO  
9001 SAI Global



Site Installation  
Capability



Site Inspection



Strategic supply  
partners to enhance  
our own manufactured  
heat exchanger  
technologies



HEAT RECOVERY

Waste Heat Recovery  
Heat Recovery Consultancy

# Most Types of Heat Exchangers

including:

- Finned Tube
- Shell & Tube
- Scraped Surface
- Gasketed Plate
- Double Wall Plate & Tubes
- Semi Welded Plate
- Fully Welded Plate
- Brazed Plate
- Aluminium Radiators
- Finned Coil
- Dry Air
- Air Cooled Condensers
- Corrugated Tube
- Diffusion Bonded
- Printed Circuit
- Custom Build

# Heat Exchange for Most Applications

including:

- Hydrogen
- Energy
- Carbon Capture
- LNG
- Oil & Gas
- Intercooling
- After Cooling
- Flue Gas Cooling
- Waste Heat Recovery
- Desublimation
- HVAC
- Dairy Food & Beverage
- Pharmaceutical
- Marine
- Steam
- Lean Amine

# Gasketed Plate Heat Exchangers

OEM or our own **FluidEX** Range

## Wide range

Modern / Efficient

## Industrial

Painted frames

## Hygienic

All stainless-steel frames

## Plate Materials

316, 304, Titanium,  
Hastelloy, Inconel, etc.

## Gasket Materials

HT NBR, HT EDPM, HNBR,  
Viton

## Capacity

1m<sup>3</sup>/h to 4,500m<sup>3</sup>/h

## 25bar

Max working pressure

## Operating Temps

-20°C to +190°C

## Standard Connections

DN25 to DN500

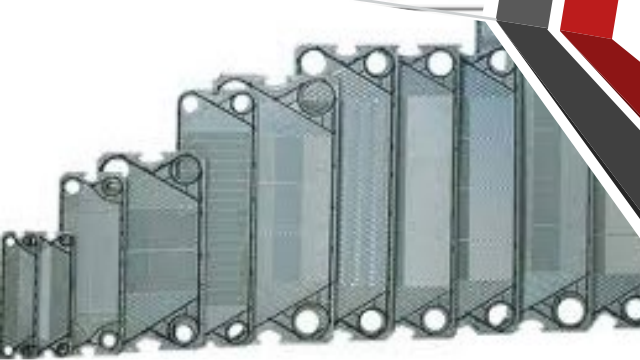
## Hygienic Dairy Fittings

Connections  
1" to 6"



# Plate Heat Exchangers Spares & Service

- Fluid Dynamics supplies high quality Plates & Gaskets for most models including:  
*APV, Alfa Laval, FluidEX<sup>®</sup>, GEA, Vicarb, Mueller, Sondex, Tranter, Hisaka, Reheat, HRS, Sepak, AHTT, APISchmidt Bretton, Arsopi, Barriquand, Fischer, Funke, SWEP...*
- On-site service, gas testing and maintenance of your PHE units
- In-house cleaning and crack detection of plate packs
- Ultrasonic cleaning system for plates and associated components
- In-house refurbishment and rebuilding of plate heat exchangers
- Redesign and design changes for most ranges possible
- Swap out frames for many sizes with minimal modifications required
- Flexibility to offer tailored service and spares solutions to meet specific requirements and needs



# Fully Welded Heat Exchangers



SUITABLE FOR A  
WIDE RANGE OF  
APPLICATIONS



GAS TO LIQUID  
OR  
GAS TO GAS



ALUMINA  
SLURRIES OR  
SIMILAR  
PROCESSES,  
ELUATES ETC.



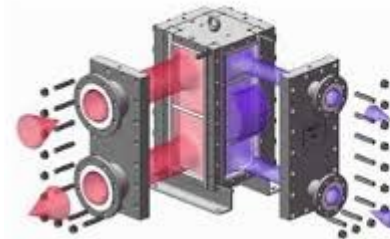
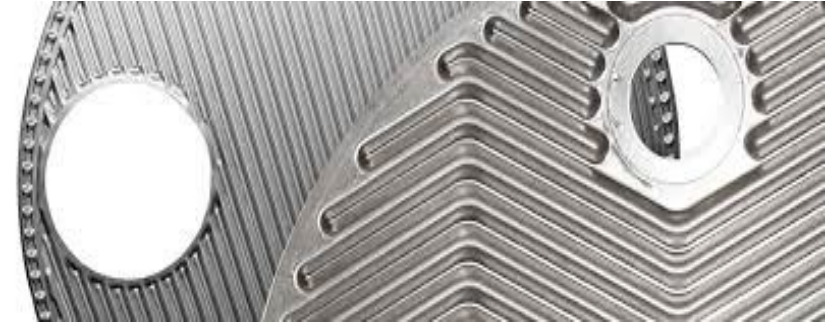
HAZARDOUS  
FLUIDS –  
CHEMICALS AND  
PETROCHEMICAL



HIGH PRESSURE  
APPLICATIONS,  
VAPOURS AND  
REFRIGERANTS



REFRIGERATION  
AND CO<sub>2</sub>





# FluidEX<sup>®</sup> Brazed Plate Heat Exchangers

## Very large range

Suit almost any application.

## Brazing

Copper or Nickel

## Very compact

High Thermal Efficiency.

## Easy Installation

## Long life

Proven  
Durability & Reliability

## Corrosion Resistant

available

## Materials

316L, SMO254 plates, Cu  
& Ni Brazing

## Twin Wall

## Safety Plates

available

## Dedicated Oil

## Coolers

(DOC)





Kelvion K°Bond

## COMPACTNESS & PERFORMANCE BONDED TOGETHER



### DESIGN & FUNCTION

For decades, we have been supplying the oil & gas industry with reliable and efficient heat exchange technology for a wide range of applications. Our broad experience and knowledge of the market has enabled us to develop and enhance our product portfolio with innovations.

K°Bond, Kelvion's diffusion bonded heat exchanger, is ideal for applications involving extreme process temperatures and pressures. Combining design with welding expertise, K°Bond withstands pressures up to 1,000 bar and temperatures from cryogenic -200 to 600 °C, while providing significant savings in weight and footprint compared to common heat exchanger solutions.

K°Bond with its diffusion bonding technology is perhaps one of the most significant and game-changing solutions for projects with restricted space – May it be for offshore plants (e. g. as high pressure vaporizer) and reliquefaction on floating units.

### ADVANTAGES

- ▶ PRESSURE RESISTANCE UP TO 1000 BAR
- ▶ WORKING TEMPERATURE RANGE FROM -200°C TO 600°C
- ▶ HIGH HEAT TRANSFER RATE THANKS TO FLUIDS PROXIMITY ALLOWING TEMPERATURE APPROACH UP TO 2°C
- ▶ LEAKAGE FREE AND SAFE
- ▶ HIGH RESISTANCE TO CYCLIC SERVICES
- ▶ UP TO 6 TIMES SMALLER THAN CONVENTIONAL S&T HEAT EXCHANGER

### K°BOND APPLICATIONS



LNG



GAS COMPRESSION OFFSHORE



FSRU



RENEWABLES



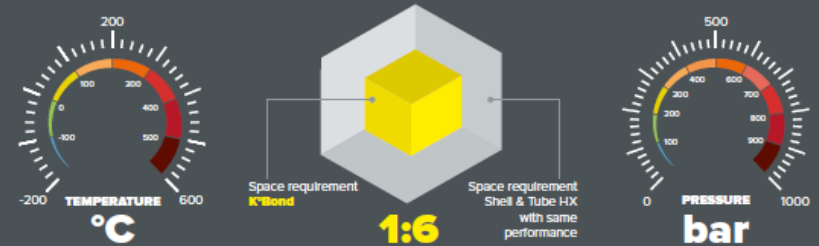
HYDROGEN



SUPERCritical CO<sub>2</sub>



### K°BOND PERFORMANCE

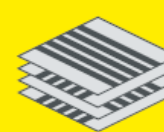


### DIFFUSION BONDING

1. Patterns are designed for each service and chemically etched on stainless steel plates.
2. Etched plates are stacked and welded through diffusion bonding process, converting them into one solid block of metal (core).
3. When required, multiple cores are welded together. Nozzles and headers are welded on cores to form final K°Bond.



Plate



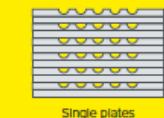
Single plates



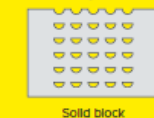
Solid block



Plate with etched channels



Single plates



Solid block



+



Diffusion bonding



Optimized in-house design software



Available in stainless steel 304L & 316L



Designed as per ASME rules, CE-marked and / or U-stamped



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Kelvion Thermal Solutions for

# CARBON CAPTURE & STORAGE

## FLUE GAS COOLING



Rekuluvo/Rekugavo  
Flue Gas Cooling

## AMINE CO<sub>2</sub> REMOVAL SYSTEMS



Air Fin Cooler  
Lean amine cooler



K°Flex  
Thermosyphon Reboiler

## CCS BY DESUBLIMATION



Desublimators  
Direct exhaust gas capture

## CCS ABSORBER



Cooling Tower  
Direct air capture

# Kelvion



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Cooling solutions for the entire value chain of  
**HYDROGEN**



## PRODUCTION & PRODUCTION UPSCALING



**Air Fin Coolers**  
High performance tube technology



**Cooling Towers**  
Smallest footprint



**Desublimators**  
Unique technology for carbon capture



**Heat recovery**  
Wide range & experience

## DISTRIBUTION



**K°Bond**  
Diffusion bonded heat exchanger  
with highest pressure resistance

## INTEGRATED SOLUTIONS & UTILIZATION (FUEL CELLS)



Customized and  
integrated solutions  
beyond heat exchangers

# Bar and Plate (Aluminium & Copper)

- Large stock of components carried at all times
- Ability to custom build to just about any size
- Aftermarket units are a specialty – quicker, cheaper and stronger than OEM
- Replacement / Renewal of existing core
- Cooling systems can be fitted with 12v/24v DC, 3 phase hydraulic and Pneumatic motors,
- Shrouds, mounting base, stone guards can also be supplied
- BSP port sizes and locations are fitted to individual requirements
- High performance for heavy duty hydraulic and lubricating applications
- Maximum working pressure 26bar
- Service, Testing, Repair and Ultrasonic Cleaning
- Serving all industry sectors



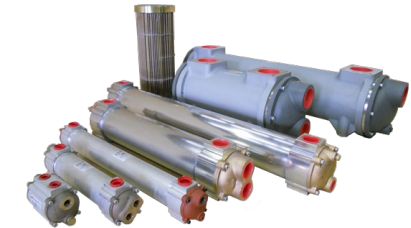
# Oil Cooler Solutions

**Fluid Dynamics is your one stop solution for automotive and industrial oil coolers**

Fluid Dynamics is an Australian owned and operated company specialising in a wide range of heat exchangers.

- Full service for oil coolers including ultrasonic cleaning, testing, repair re-engineer and replacement.
- Large range of stock and equipment for even the most complicated projects.
- Supply of OEM and aftermarket oil coolers ensuring the best solution, the best quality, and very competitive pricing.

**Fluid Dynamics - for all your oil cooler needs**



# Coil & Finned Tube Heat Exchangers

All industries served to the highest standards

All types of Coils & Finned Tube units designed & manufactured to all major industrial standards.

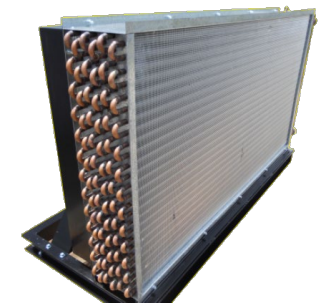
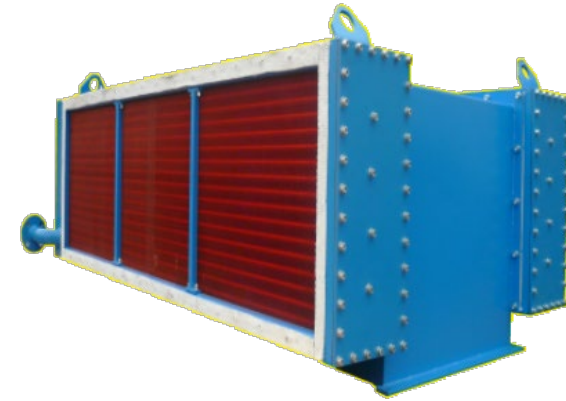


Special coatings applied to all coil units where required

Dry coolers – single through to multi core, multi fan, condensers and adiabatic coolers

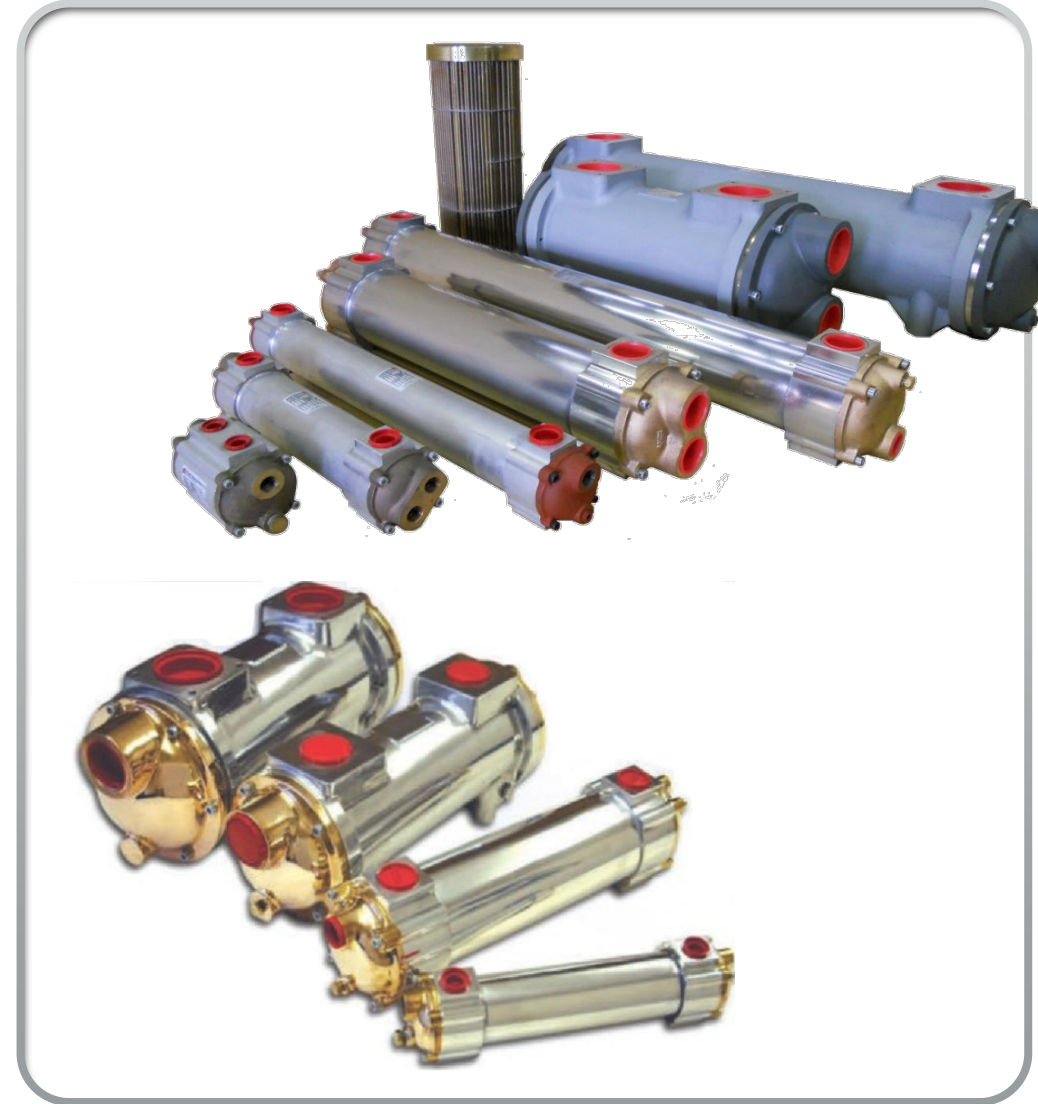
Round tubes, elliptical tubes, compact fin, single fin, spiral fin, rectangular fin

All materials available including carbon steel tubes and fins, Cu tube and fin or Ali fin, CuNi tubes and stainless or Ali fin, stainless tube and fin



## Shell & Tube (off the shelf)

- Fluid Dynamics has been synonymous with shell and tube heat exchangers for over 40 years
- One of Australia's largest Stockists of shell & tube oil coolers, Custom Build, transmission oil coolers & water to water coolers. Most standard ranges are available ex stock
- We offer a full range of services including like for like replacements, new units, repairs, testing, service and ultrasonic cleaning, new tube bundles, repairs to existing tube bundles and re-tubing. All carried out in our well-equipped Hallam factory
- Ideal for many applications – marine, industrial, on-road & off-road etc.





# Shell & Tube-Custom Build

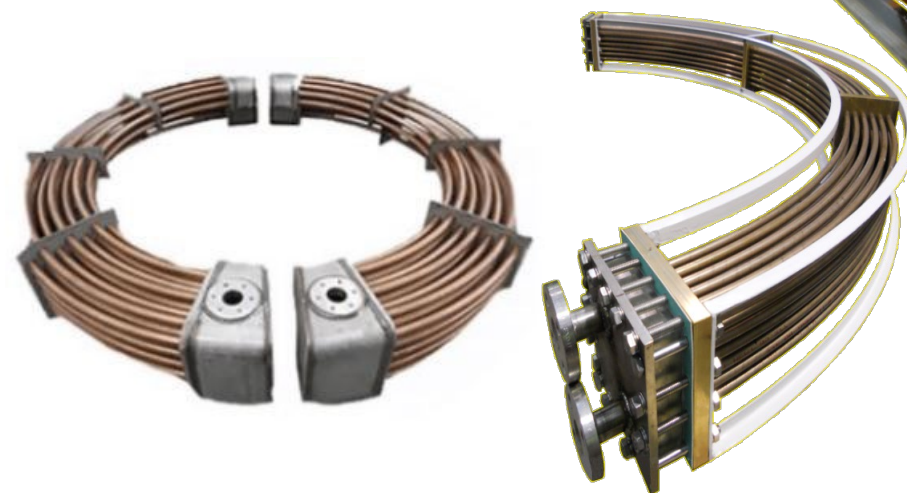
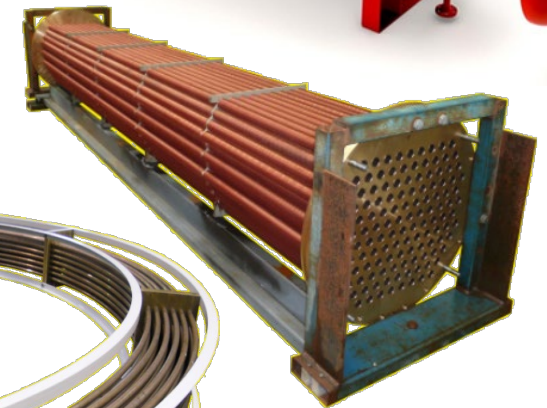
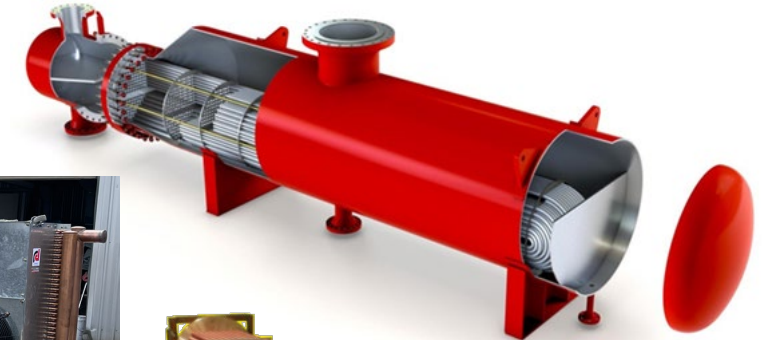
- One our key strengths is our ability to design, re-engineer, manufacture, refurbish, test, clean & and repair all types and sizes of shell and tube heat exchangers
- We provide heat exchangers for all applications
- Built to the highest standards and using the best quality materials
- We can provide new tube stacks built to exact standards to fit in to your existing shell as well as manufacture the entire shell and tube exchanger



# Special Project Heat Exchangers

At Fluid Dynamics we pride ourselves in our skills and ability to provide solutions for almost every project.

- Hydrogen Coolers
- Thrust Bearing Coolers
- Large Transformer oil Coolers
- Generator Coolers
- Large Cooling Coil Systems
- No matter what the requirement Fluid Dynamics can provide the correct technology and solution to match it



# FluidEX<sup>®</sup> Corrugated Tube Heat Exchangers



Highly efficient all stainless-steel shell and tubes with other materials available



Twice the heat transfer coefficient of smooth tube heat exchangers



Working temperatures up to 550°C



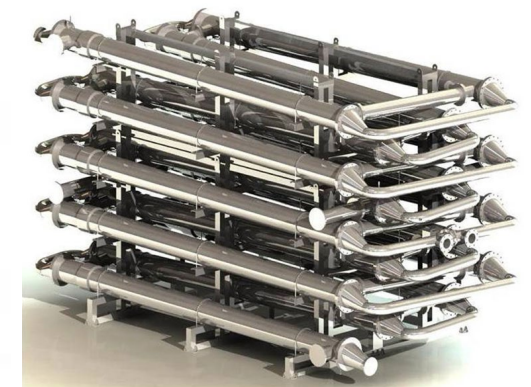
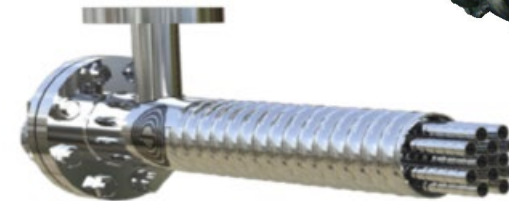
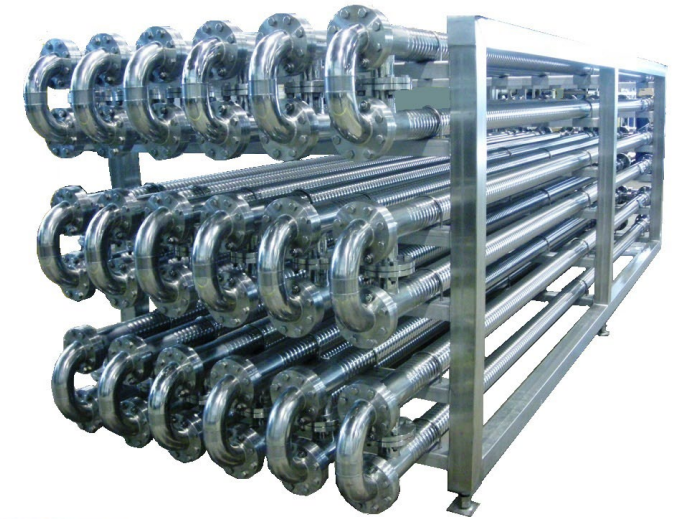
Hard start through to multi-start corrugation designs for different fluids



Suitable for almost every feasible hygienic or industrial application



Ideal for shear-sensitive, viscous or highly viscous products



# What Heat Transfer Application are you looking for?

- Heating
- Cooling
- Regeneration
- Pastuerisation
- Desuperheating
- 2 Stage Heating / Cooling
- Waste Heat / Energy Recovery
- Condensate Recovery
- Exhaust Gas Heat Recovery
- Evaporation
- Condensing



- **Fluid Dynamics**

**If your application is not listed then please ask.**

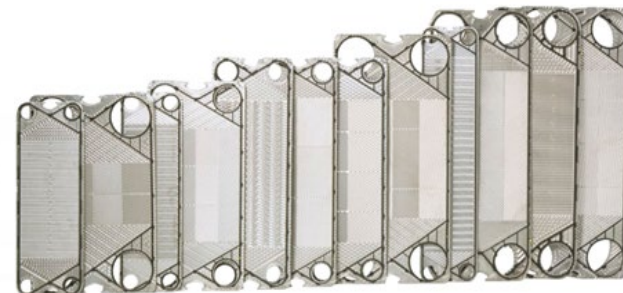
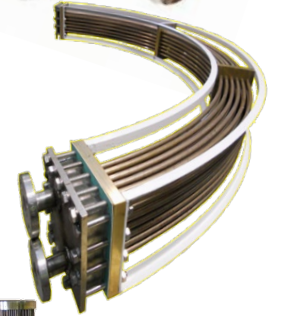
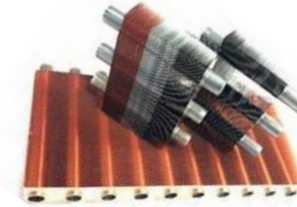
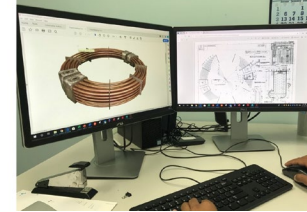
# Ultrasonic Cleaning

- Our Ultrasonic Cleaning System uses special fluids (not harsh acids).
- Huge industrial sized tank
- Although it operates normally at 50°C to 60°C our system can heat to 90°C if required.
- When combined with the power of ultrasonics the system effectively removes carbon, rust, oil, epoxies, scale etc..



# Heat Exchanger Spares OEM & FluidEX<sup>®</sup>

- Spare or Replacement Custom Heat Exchanger Re-Builds
- Spare or Replacement Tube Bundles & Tube Nests
- Spare or Replacement Tube Plates (blanked or pre drilled)
- Spare or Replacement Aluminium Cores
- Spare or Replacement Finned Tubes – (most types)
- Replacement Spare Parts for all plate heat exchanger makes including complete plate packs
- Replacement Brazed Plates, SWEP, SONDEX, APV, WTT, FUNKE etc.



# Servicing & Maintenance

Fluid Dynamics has an experienced and well-equipped team of professional heat exchanger service technicians covering all States in Australia and at your call.

## Cleaning, Testing, Inspection & Repair

The list of what we can do on your site is extensive and includes:

- Gas Integrity Testing
- Inspection and Evaluation
- Inline Chemical Cleaning
- Installation and Removal
- Re-gasketing
- Replacement of Spare Parts
- Replacement of Plates and Plate Packs
- Complete Heat Exchanger Builds and Re-Builds
- Repair and Re-builds of Tube Bundles
- Finned tube removal and replacement
- Leak Detection
- Borescope Inspections
- Material & Failure analysis
- Non Destructive Testing - Eddy Current, Ultrasonic etc.
- Waste disposal etc.



## All Heat Exchangers

Shell & Tube; Finned Tube; Finned Coil; Thrust Bearing; Plate (Gasketed, Welded and Semi-Welded); Aluminium Radiators etc.

## All Applications

Oil, Air and Water Cooling & Heating; Condensers & Evaporators; Generator Air Coolers; Refrigeration; Steam

# Pumps & Valves

Fluid Dynamics provides sales and service for a wide range of pumps and valves used in modern production facilities supported by our experts who are on hand to provide service, spares and support to ensure efficiency and performance from all your equipment.

- Service, Repairs, Overhauls, Refurbishment
- Maintenance - General & Planned
- Plant Obsolescence Management
- Rotating & Spare Parts Replacement
- Plant Monitoring
- Training
- Sales

## Valves

Single and Double Seat Seal • Ball • Butterfly • Check • Mixproof

## Pumps

Positive Displacement • Centrifugal • High Pressure • Lobe





# Homogenisers & Buttermakers

Fluid Dynamics now offers expert onsite servicing of Homogenisers and Buttermakers and other similar equipment - Australia-wide.

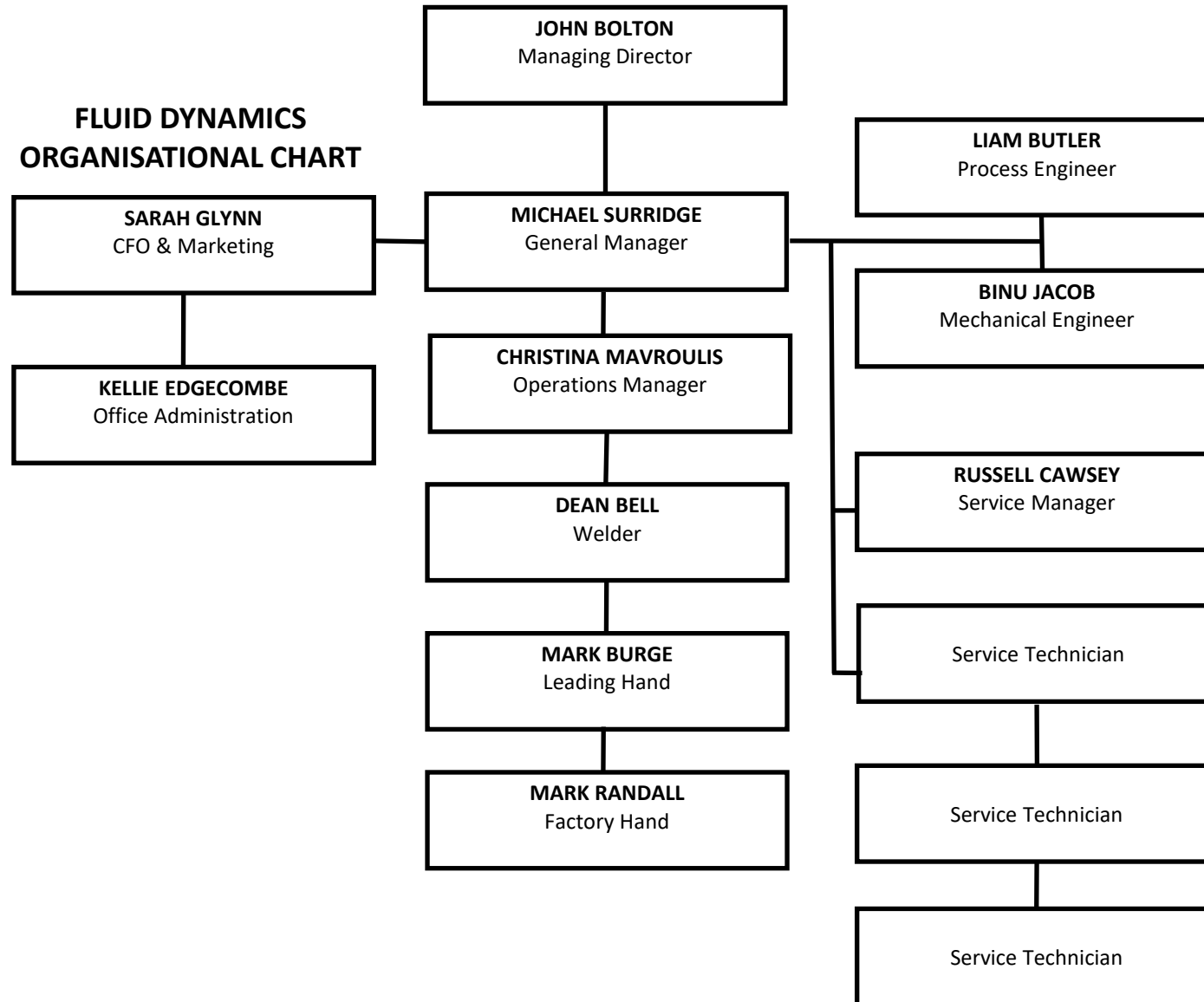
Contact Fluid Dynamics' and have our team of expert service technicians provide annual wet-end servicing of all APV Homogenisers and Buttermakers including drive-end inspection and oil and oil filter replacement.

## Services

- Service, Repairs, Overhauls, Refurbishment
- Maintenance - General & Planned
- Rotating & Spares Replacement
- Plant Management
- Plant Monitoring
- Training
- Sales



**FLUID DYNAMICS  
ORGANISATIONAL CHART**



# Some of our Valued Customers:



# Fluid Dynamics Contacts & Location

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# Fluid Dynamics

Heat Exchange Solutions since 1981



The Heat Exchanger Specialists for all your Heat Exchanger Needs