MANAGING ENERGY EFFICIENTLY

FOOD, DAIRY AND BEVERAGE INDUSTRIES
HRS Heat Exchangers provide a range of heat exchangers, components, modules and complete processing systems that help you to optimise production, make the most of raw materials, whilst reducing energy consumption, waste and emissions.

Food and beverage processors around the globe rely on our technologies including heat exchangers, pumps, tank equipment and solutions for aseptic filling. These are supplied as stand-alone components or complete solutions and can be customised for your specific processing needs by our engineers.

HRS Heat Exchangers operates at the forefront of thermal technology, offering innovative and effective heat transfer products worldwide with a focus on managing energy efficiently.

With over 35 years’ experience specialising in the design and manufacture of an extensive range of corrugated tube and scraped surface heat exchangers, in compliance with the European Pressure Vessel Directive and ASME, HRS has a global network of offices including: UK, Spain, USA, Malaysia, Australia and India; with manufacturing units in the UK, India and Spain.

Our patented and proven heat transfer technologies, combined with our knowledge make it possible to offer best in class solutions for the following food and beverage applications:

- Juices and carbonated drinks
- Dairy and cheese based products
- Fruit and vegetable particulates
- Purees and concentrates
- Sauces
- Desserts
- Prepared Foods
- Fats and Oils
- Confectionary
- Brewery and Distillery

**PRODUCT RANGE**

- **Heat Exchangers:**
  - Corrugated Tube
  - Scraped Surface
  - Plate Heat Exchangers
- **BP Pump**
- **Aseptic Fillers**

- **Thermal Processing Systems:**
  - Pasteurisation
  - Sterilisation
  - Aseptic Filling
  - Evaporation
  - Ultra High Temperature (UHT)
  - CIP and SIP
  - Deaeration
Using HRS’ corrugated tube technology, both heat transfer and efficiency are increased over standard smooth and dimple tube heat exchangers. In addition, potential product fouling is minimised. This makes it possible for HRS to provide more compact and economical heat exchanger solutions.

**AS Series**
Triple tube or annular space heat exchangers for highly viscous fluids.

**DTA Series**
Tube in tube heat exchangers for fluids with large particles in suspension.

**KCIP Series**
An ideal multi tube heat exchanger for steam to water applications such as CIP cleaning.

**MI Series**
Multi tube heat exchangers with hygienic design.

**MR Series**
Hygienic multi tube heat exchangers with removable tube bundle. For direct heat recovery applications.

**MP Series**
Multi pass heat exchangers offering greater flexibility for optimising fluid velocity, heat transfer rates and thermal length in a reduced footprint.
The solution for hygienic applications with delicate products

The patented design is based on a traditional shell and tube heat exchanger with scraping elements inside each tube. The reciprocating movement of the scrapers mixes the fluid whilst cleaning the heat exchange surface. This keeps heat transfer high and reduces downtime. In addition, the scraping movements introduces turbulence in the fluid increasing levels of heat transfer.

This design makes the Unicus Series the ideal heat exchanger for applications where fouling or low heat transfer is a limiting factor.

The gentle movement of the scrapers allows the system to be used with delicate products, such as whole fruit or vegetable pieces, without destroying the integrity.

The Unicus is the ideal solution for food products with large solid particles, which require gentle handling, whilst attaining superior product integrity.

Some of the unique features of the Unicus Series include:

- Larger heat transfer area per unit
- Maintained product identity
- Increased uptime
- Reduced footprint
- Suitable for highly viscous substrates
The R Series is a rotary scraped surface heat exchanger developed for hygienic applications. Each inner tube contains a scraper bar fitted with a helical screw which rotates at high speed and enhances flow through the tube whilst reducing pressure drop. In addition, the continuous scraping action eliminates fouling on the inner tube wall, ensuring that the heat transfer area is clean at all times.

The R Series technology uses a rotary scraper rod. This scraper rod can reach a speed of up to 300 rpm resulting in high levels of shear and mixing at the heat transfer surface; dramatically increasing the heat transfer rate.

Some of the unique features of the HRS R Series include:

- Large heat transfer area
- Single, three and six tube options, all with removable tubes
- Reduced pressure drop
- High level of product recovery
- Low noise level gearbox
- Energy efficient

The R Series is the ideal solution for high value viscous applications such as honey, treacle, custards and creams, where fouling or low heat transfer is a problem.
The HRS BP Series is designed to handle very delicate and viscous food stuffs, with the ability to pump at high pressures without damaging the food particles.

Experience of working with difficult heat transfer solutions in the food industry has proved that pumping products without destroying their integrity is as important as developing heat exchange solutions.

To overcome these problems, HRS has developed a hygienic reciprocating positive-displacement pump (the BP Series Piston Pump) that provides the following benefits:

- Gentle product treatment
- High flow rates (up to 30 m³/hr)
- High pressure (30 bar)
- Works under vacuum
- Can run dry
- Minimal spare parts
- No product contact seals
- High temperatures (120°C)

HRS offers a plug and play trial piston pump to aid zero risk product trials.
Aseptic filling ensures products remain **safe, fresh and retain quality** for up to twelve months, thus maintaining their taste, colour, texture and the essential nutritional values.

Our AF aseptic filler is specifically designed for bag in box or bag in drum filling, with the option of a single or dual filling head which both come with 25mm or 50mm filling nozzle types. This makes the AF suitable for standard packaging materials.

Our aseptic process ensures that both food and packaging materials are free of harmful bacteria when the product is packaged. Sterile conditions during the packaging process are maintained using steam, ensuring the product is filled without contamination before the package is sealed.

The aseptic filler has been designed for high and low acidity products and can fill fluids, concentrates and products with particulates. The automatic head design provides high filling speeds and can perform motor driven vertical and horizontal movements. Other features include automatic CIP cleaning, reliable weighing, control and monitoring of the finished package.

The HRS AF Series of aseptic fillers is suitable for the following products and applications:

- Fruit pulps, purees and concentrates
- Fruit slices and dices
- Vegetables purees, dices and concentrates
- Vegetable soups and sauces
- Delicate products and concentrates
THERMAL PROCESSING SYSTEMS

HRS have developed an innovative range of combined aseptic sterilisation and pasteurisation systems incorporating our corrugated tube technology, designed to process high quality food in a cost-effective way. Each system is bespoke designed with the option to include direct or indirect energy recovery, which enables up to 90% of the energy to be reused. This greatly reduces the overall energy consumption and significantly shortens the return on investment.

The heat treatment sections can be combined with other process steps such as homogenisation and deaeration. Efficient system integration of equipment enables us to provide complete solutions for all hygienic industries.

Our processing systems give processors a range of benefits including: extended product shelf life, convenient storage with enhanced hygiene and food safety and conform to global standards such as EHEDG, 3A, FDA and AS3993.

ASEPTIC STERILISATION & PASTEURISATION SYSTEMS

Multi Tube Pasteuriser/Steriliser
THERMBLOCK M SERIES

Low or medium viscosity products

Using our multi tube corrugated heat exchangers for low to medium viscosity fluids.

Double Tube Pasteuriser/Steriliser
THERMBLOCK DTA SERIES

Viscous products with large particulates

Using our double tube or tube in tube corrugated heat exchangers for fluids with large particulates in suspension.
**Viscos products without particulates**

Using our annular space or triple tube corrugated tube heat exchangers for highly viscous fluids.

**Aseptic Filler Pasteuriser/Steriliser**

**ASEPTICBLOCK AF SERIES**

Complete aseptic processing unit

Single skid design combining our Pasteurisation/Sterilisation and Aseptic Filling technologies.

- Single or double filling heads
- 25mm or 50mm filling nozzles
- High or low acid options
- FDA approved design
HRS evaporation systems are designed for concentration of products from juices and purees to tomato and liquid cheese based products. Application dependant, we use our corrugated tube or Unicus scraped surface heat exchangers as the evaporator, in a forced recirculation setup. Multiple effect systems or use of mechanical or thermal vapour recompression can be supplied, increasing savings.

HRS applies two heat transfer technologies within its evaporation systems:

**Corrugated Tube Evaporation Systems**

Using the K Series as an evaporator module for the evaporation of low viscosity effluents with small particulates high heat transfer and good resistance against fouling.

**Applications:** fruit pulps and purees or products with organic solids in low concentration and up to medium viscosities.

**Scraped Surface Evaporation Systems**

Using the Unicus Series as an evaporator module for high fouling fluids with elevated viscosities. When concentrating to a high dry solid percentage the risk of fouling and high viscosity (low heat transfer) become apparent. For these applications, the Unicus is ideal due to its self-cleaning scraper design.

**Applications:** Liquid cheese and sauces with high fouling risk and organic solids with high dry matter content.
The cleaning and sanitisation of a process plant is one of the most critical aspects of food processing to ensure the health and safety of the consumer. Proper cleaning is essential for the production of high quality food products especially those with extended shelf life.

HRS offers cleaning in place (CIP) and sterilisation in place (SIP) systems for hygienic industries. Fully skid mounted and modular design enables for quick and easy site installation.

Systems are supplied fully automated using a PLC controlled system, which can be stand-alone or integrated into the factory’s main control system.

**Ultra-high Temperature (UHT) Systems**

Ultra-high temperature is ultra-heat treatment or ultra-pasteurisation commonly known as UHT sterilises products by heating it above 135°C. This heat treatment maximises the destruction of microorganisms while minimising denaturing of the product.

The systems are automated for uninterrupted operation, our UHT steriliser can heat up to 142°C, with a holding time of 3s to 6s, and cools the product for aseptic packaging. Automated CIP cleans efficiently with minimal human intervention.

**Deaeration**

Deaeration is principally intended to remove any air present in the material to be processed. The presence of air in many food products encourages oxidation and may be detrimental to product life or quality, in many cases it can increase thermal resistance and heating load.

HRS has developed an air removal (deaeration) module which can be fitted into the production line before thermal treatment takes place.