

The background of the slide is a faded, grayscale image of industrial machinery, likely a food processing or beverage production line. It includes various pipes, tanks, and mechanical components. A large orange rounded rectangle is in the top left corner. The text 'ENERGY MOVES US' is overlaid in the center in a large, bold, orange sans-serif font.

ENERGY MOVES US

FOOD, DAIRY AND BEVERAGE INDUSTRIES



HRS Heat Exchangers provide a range of heat exchangers, components, modules and complete processing systems that help you to optimize 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 customized 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 40 years' experience **specializing in the design and manufacture of an extensive range of turnkey systems and components incorporating our corrugated tube and scraped surface heat exchangers technology,** in compliance with the Global Standards.

HRS has a global network of offices: UK, Spain, USA, Canada, Malaysia, Australia and India; with manufacturing plants in 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
- Purées and concentrates
- Sauces
- Plant Based Products
- Desserts
- Prepared foods
- Fats and oils
- Confectionary
- Brewery and distillery
- CBD

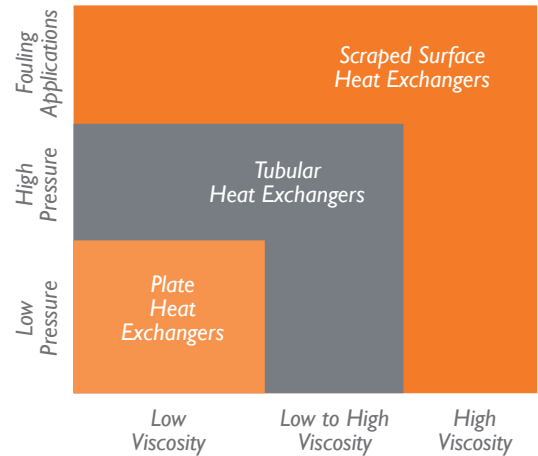
PRODUCT RANGE

- **Heat Exchangers:**
 - Corrugated Tube
 - Scraped Surface
 - Plate Heat Exchangers
- **BP Pumps**
- **Aseptic Fillers**
- **Thermal Processing Systems:**
 - Pasteurization
 - Sterilization
 - Aseptic Filling
 - Evaporation
 - Direct Steam Injection
 - Juice Crushing and Remelting
 - Ultra High Temperature (UHT)
 - CIP and SIP
 - Deaeration

CORRUGATED TUBE HEAT EXCHANGERS

High level of efficiency for the food, dairy and beverage industries

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 minimized**. This makes it possible for HRS to provide **more compact and economical** heat exchanger solutions.



AS Series

Triple or quadruple tube 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 multitube heat exchanger for steam to water applications such as CIP cleaning.



MI Series

Multitube heat exchangers with sanitary design.



MR Series

Sanitary multitube heat exchangers with removable tube bundle. For direct heat recovery applications.



MP Series

Multipass heat exchangers offering greater flexibility for optimizing fluid velocity, heat transfer rates and thermal length in a reduced footprint.



SH Series

Multitube heat exchangers with double tubeplate design.



SCRAPED SURFACE HEAT EXCHANGERS

Food and beverage processing with reduced downtime

Our scraped surface heat exchangers are self-cleaning, keeping heat transfer high at all times.

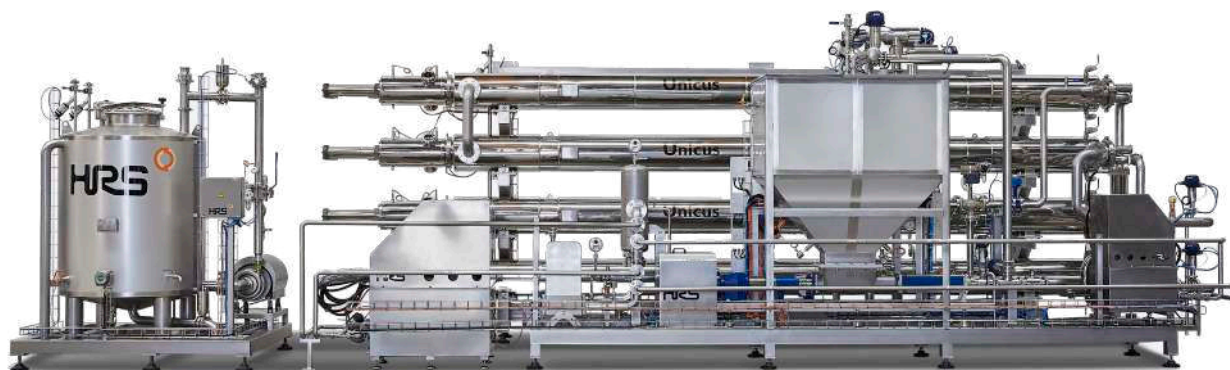
HRS UNICUS SERIES

The solution for sanitary 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 HRS 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.



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

- Larger heat transfer area per unit
- Maintained product identity
- Increased uptime
- Reduced footprint
- Suitable for highly viscous substrates

HRS R SERIES

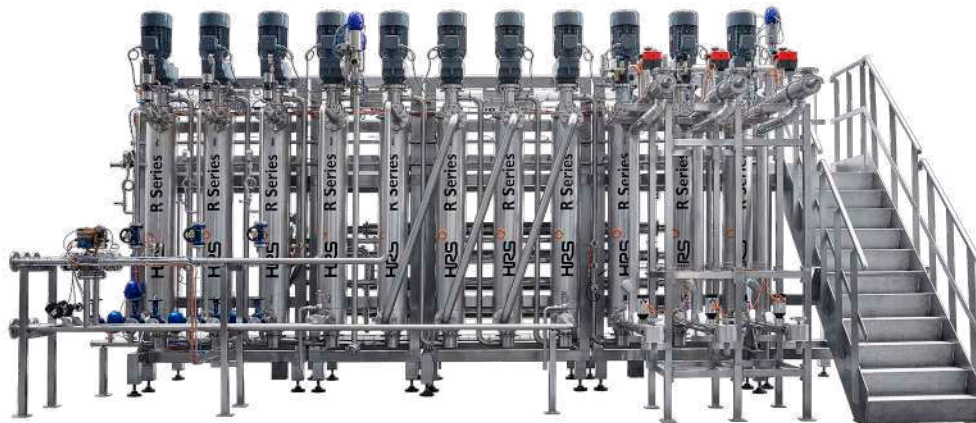
The solution for high value viscous applications

The HRS R Series is a rotary scraped surface heat exchanger developed for sanitary 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. Furthermore, the continuous scraping action eliminates fouling on the inner tube wall, ensuring that the heat transfer area is clean at all times.

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

transfer surface; dramatically increasing the heat transfer rate.

In addition to the standard R series a heavy duty version is available. The HRS RHD Series has been developed for the more demanding applications with extreme viscosities. It has all the features and benefits of the standard model, with increased motor size, scraping rods, extra mounting supports for the scrapers and motor enable the unit to be used under extreme conditions.



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

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

The HRS R Series is the ideal solution for high value viscous applications such as honey, molasses, custards and creams, where fouling or low heat transfer is a problem.



THERMAL PROCESSING SYSTEMS

HRS have developed an innovative range of combined aseptic sterilization and pasteurization systems incorporating our corrugated tube technology, designed to process high quality food in a cost-effective way. Each system is custom 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 homogenization and deaeration. Efficient system integration of equipment enables us to provide complete solutions for all sanitary industries

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

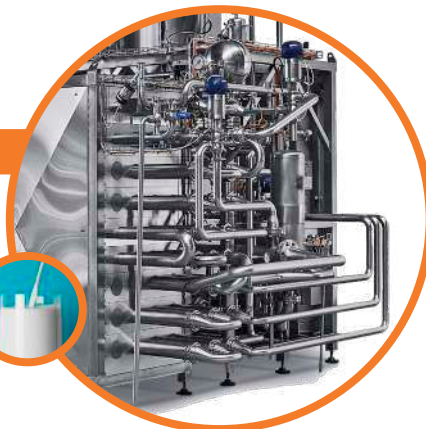
ASEPTIC STERILIZATION & PASTEURIZATION SYSTEMS

Multitube Pasteurizer/Sterilizer

THERMBLOCK MI SERIES

Low or medium viscosity products

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



Double Tube Pasteurizer/Sterilizer

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.



Annular Space Pasteurizer/Sterilizer

THERMBLOCK AS SERIES

Viscous products without particulates

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



OHMIC Pasteurizer/Sterilizer

THERMBLOCK O SERIES

Low viscosity juices

HRS Ohmic technology uses the latest electronics to ensure that the temperature curve is very smooth, which helps to preserve product quality.



Scraped Surface Pasteurizer/Sterilizer

THERMBLOCK R SERIES

Viscous products

Using our R Series rotating scraped surface heat exchangers for highly viscous purees, creams, gels & pastes.



Aseptic Pasteuriser/Steriliser & Filler

ASEPTICBLOCK

Complete aseptic processing & filling

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



HRS Asepticblock Mini



- Single or double filling heads
- 25mm or 50mm filling nozzles
- High or low acid options
- FDA approved design

The HRS Asepticblock Mini Series is a skid-mounted unit which combines a pasteuriser or steriliser system with an aseptic filler for food manufacturers requiring a compact solution.

THERMAL PROCESSING SYSTEMS

EVAPORATION

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 vapor recompression can be supplied, increasing savings. HRS applies two heat transfer technologies within its evaporation systems:



Mango Pulp Evaporation

Corrugated Tube Evaporation Systems

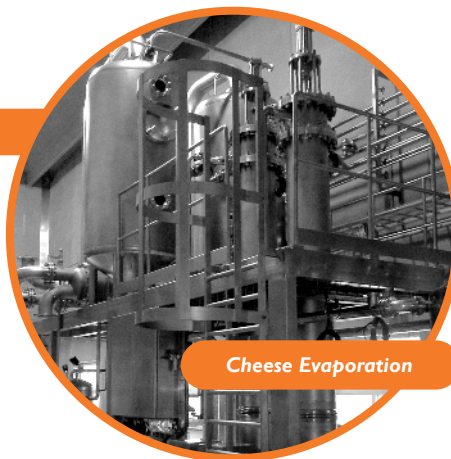
Using the HRS K Series as an evaporator module for the evaporation of low viscosity effluents with small particulates high heat transfer and good resistance against fouling.

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

Scraped Surface Evaporation Systems

Using the HRS 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.



Cheese Evaporation

CLEANING IN PLACE (CIP) & STERILIZATION IN PLACE (SIP)



The cleaning and sanitization 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 sterilization in place (SIP) systems for sanitary 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.

JUICE CRUSHING AND REMELTING



The HRS I Series offers options to de-pack and crush (IC Series) and melt (IM Series) frozen juice (a process also sometimes known as re-melting) ready for storage and further processing.

The HRS I Series uses existing HRS heat exchanger technologies (including HRS DTA Double Tube and HRS MI Multitube heat exchangers) together with an ice crusher to re-melt both large and small chunks of ice, providing optimal rates of heat transfer and energy efficiency.

ULTRA HIGH TEMPERATURE (UHT) & DIRECT STEAM INJECTION

Ultra-high temperature is ultra-heat treatment or ultra-pasteurization commonly known as UHT sterilizes products by heating it above 275°F. This heat treatment maximizes the destruction of microorganisms while minimizing denaturing of the product.

The systems are automated for uninterrupted operation, our UHT sterilizer can heat up to 287.5°F, with a holding time of 3s to 6s, and cools the product for aseptic packaging. Automated CIP cleans efficiently with minimal human intervention.

The HRS DSI Sterilizer is a process system for the continuous direct aseptic Ultra High Temperature (UHT) treatment of high quality aseptic products. Using direct steam injection for continuous UHT treatment is commonly used for heat-sensitive low-acid products such as plant-based milks, ESL (extended shelf life) products, cream, desserts, and many other dairy products.



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.

HIGH PRESSURE PISTON PUMPS

HRS BP SERIES

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 proven that pumping products **without destroying their integrity** is as important as developing heat exchange solutions.

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

- Consistent product identity
- Gentle product treatment
- High flow rates (up to 132 gpm)
- High pressure (435 psi)

- Can run dry*
- Minimal spare parts
- High temperatures (248°F)

**Can run dry for a short period only*

HRS offers a plug and play trial piston pump to aid zero risk product trials



HRS BPM

The HRS BPM Series is mobile version mounted on a mobile skid unit for easy movement.

HRS BPSC

The HRS BPSC Series is specifically designed for highly viscous materials such as pastes and particularly those which are produced and packed at low temperature, using a gravity-fed hopper, together with a screw conveyor.

HRS BPH

The HRS BPH pump is mounted horizontally and inlet is vertical. The standard clap valve is replaced with an automatic ball valve. Also comes with the option of a feed hopper.

ASEPTIC FILLERS

HRS AF SERIES

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 with 25mm or 50mm filling nozzle types. This makes the HRS AF suitable for standard packaging materials.

HRS offers a bag in box/drum single or double headed aseptic filler

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 able to fill fluids, concentrates and particulate product. 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, purées and concentrates
- Fruit slices and dices
- Vegetables purées, dices and concentrates
- Vegetable soups and sauces
- Delicate products and concentrates



HRS UK

+44 1923 545 625

HRS Spain

+34 968 676 157

HRS USA

+1 770 726 3540

HRS Malaysia

+60 3 8081 1898

FD2309US

HRS India

+91 20 2566 3581

HRS Australia

+61 3 9489 1866

HRS New Zealand

+64 9 889 6045

www.hrs-heatexchangers.com