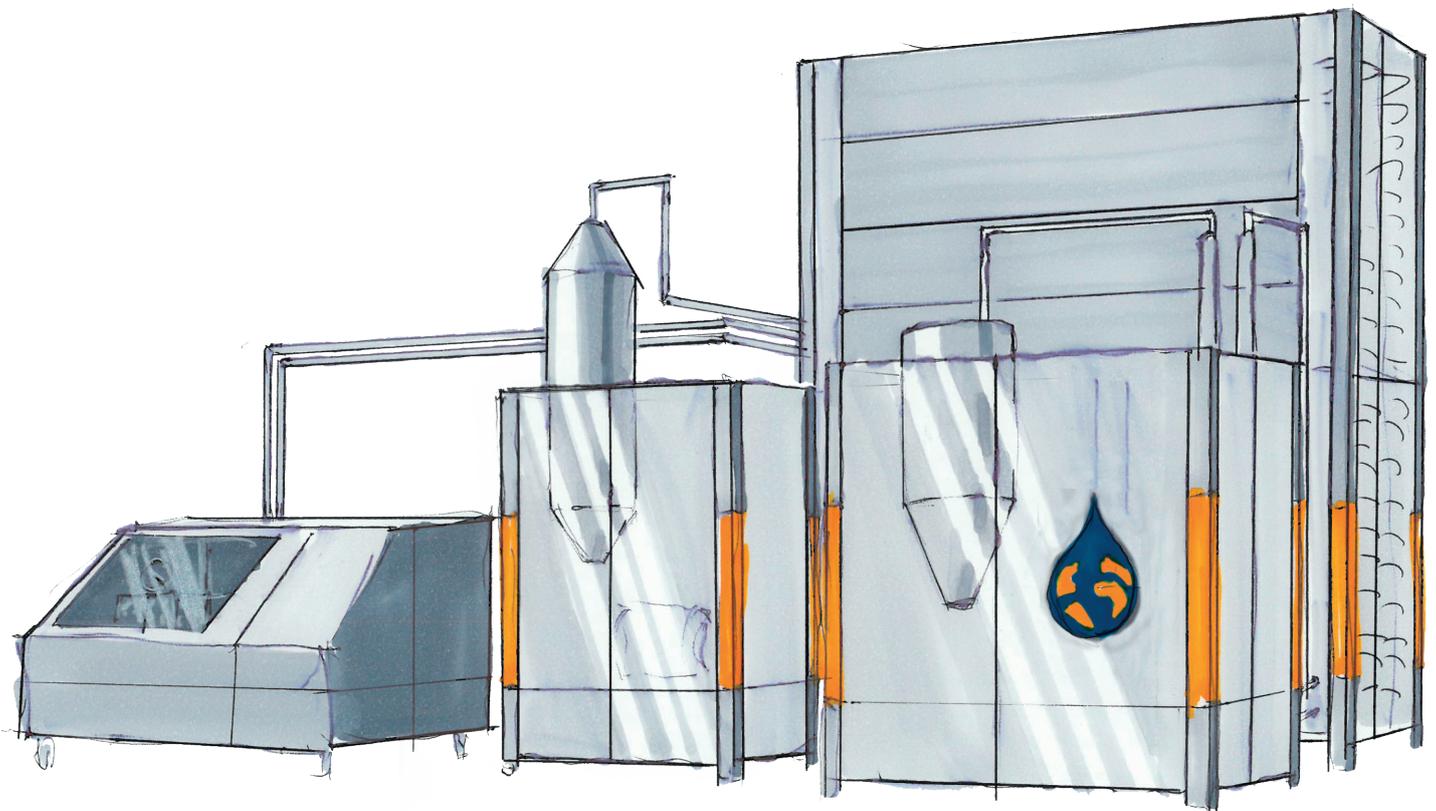


DS TRIPLE TUBULAR UHT PLANT



It is the details of the plant that makes it different and appealing to costumers!

»» **THE DIFFERENCE IS IN THE DETAILS OF THE PLANT**

DS Triple works closely with its customers to ensure the best technology choice and plant design to meet their needs today as well as into the future.

DS Triple is a Danish company which is specializing in supplying technologically advanced plants for Thermal Treatment of fluid food products.

The technology is well known for its principles; however, DS Triple is specializing in incremental improvements that provides value to its customers, both when it comes to product quality, total uptime, reliability as well as cost of operation.

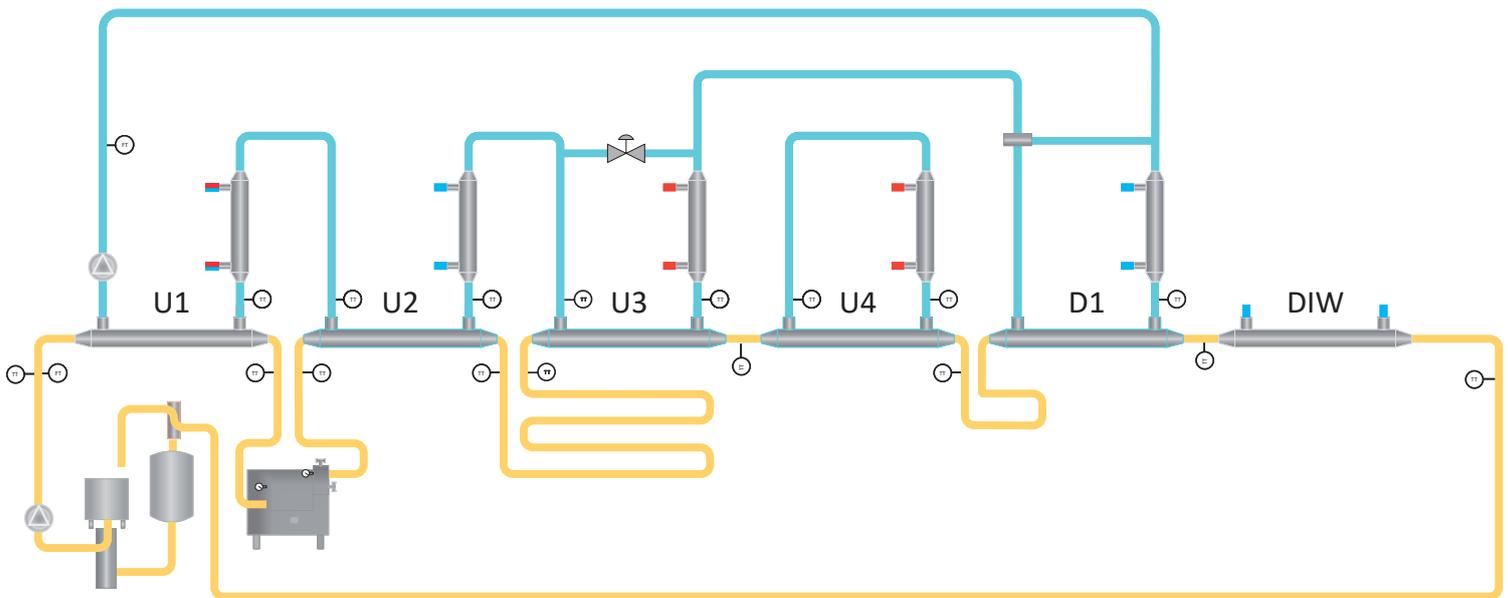
DS Triple has as the only one, used software to introduce new levels of process technology into the processing of liquid products.

Our system is not just to control the steps of the process but also as an added value, to fuse Science, process technology and intelligent soft controls.

The focal point is reliable performance, and we have taken aim at improvements that matters to the daily life in a manufacturing environment using experience that has been earned through many years of being in the industry by all the members of the team of DS Triple.

It is the detail of the plant from DS Triple that makes it different, as well as appealing, to costumers!

DS TRIPLE TUBULAR UHT PLANT FEATURES



- Highly efficient heat transfer for reduced processing time and cost
- Product to product heat exchangers will be used whenever possible offering up to 50% savings
- Improving intermediate CIP to avoid breaks in plant sterility and increase plant availability
- Ensure maximum run times, without increasing risks of blocked inner tubes by better temperature control and optimized fluid velocity

»» THE SYSTEM AND THE HARDWARE

The System

The DS Triple Tubular UHT plant is an integrated system, where the media is used to its full ability to provide a well-controlled length of run, maintaining the quality of the product throughout.

All temperature parameters are kept at their intended values in every section by the ability to vary the flow independently based on continuous measurements on the product as well as the media side.

As the plant starts to have deposits, only the section which is affected, will be compensated without affecting the rest of the plant.

The circuit cooler is placed so that it saves water and provides hot water at a usable level.

The Hardware

In its quest for improvement of efficiencies DS Triple focuses on the best possible way of ensuring 100% quality output.

Besides its own, ever growing, line of hardware, DS Triple uses valves and pumps from renowned manufacturers, if requested, if required, at customer's choice in order to provide the lowest stock level of spare parts on site.

The plant is designed so that flow during CIP and processing is similar, when at all possible.

This is being aided by the DS Triple line of hardware that enables the entire plant to carry on through intermediate CIP's to new productions for days.

This allows an intermediate CIP to be as effective as a 'normal' CIP and opens the path to even higher productivity as the production runs can run uninterrupted.

DS Triple develops specialized in hardware for improving reliability and productivity as for example aseptic pulsation Dampers, Injectors, Cross valve solutions and Tubular heat exchangers all with very specific details that will make production or maintenance more efficient for the client.

»» **HOLLOW DIAPHRAGM** **ASEPTIC PULSATION DAMPER**

Uptime is key for the plant performance, meaning that long runs including intermediate CIP's should not be interrupted due limited service times of any part of the equipment! This is where DST Aseptic pulsation damper earns its place on the list of very useful innovations!

A pulsation damper based on an air pocket pulsation damper runs out of air unless resupplied through a complex system. It is very vulnerable to low pressure conditions in the plant and importantly dead-end pulsation dampers also has to be cleaned manually.

All of the above, interrupts the production cycles which calls for a full CIP and re-sterilization. An expensive and unproductive time for the equipment, if avoided, time can be allocated profitable activities.

The DS Triple Aseptic Pulsation Damper is 'solid state', and will not be disturbed by events as described above. The damper is very effective, and has a truly positive through flow of the product as well as a positive flowing steam flushed leak detection.

The damper is effectively cleaned during CIP and does not need to be disassembled for manual cleaning, lending itself to runs that may well go over a week.

The damper is effective over a large pressure range, and in order to make the pulsation damper more effective at low pressures, it can be supplied with different membranes to provide optimal service both at the very low end of pressures as well as the high pressures up to 35 bars.

A pulsation damper that can be calibrated to meet a variety of pressure ranges and can accommodate weeklong runs is an industry first.

»» **THE TUBULAR** **HEAT EXCHANGER**

DS Triple has launched its own tubular heat exchanger with a number of configurations. The design is rooted in known principles; however, the design is made so that any shell can fit into any position.

This means in short that unlike conventional systems, every tube and shell does not have to be custom designed, which means that in case of a need to change one or more units, the unit

does not have to be specially designed, and in essence, a few, or in some cases 1 tube can be used as a replacement to fit in any part of the plant.

The Tube heat exchanger comes in in various configurations able to suit the processing of most liquid and semi liquid products. The heat exchangers are available in 2, 3 and 6 meter versions to suit product requirements and building design at the same time.

»» 'SOFT TOUCH' HARDWARE AND SOFTWARE INTEGRATION

DS Triple employs the most sophisticated software in the industry using an open platform that allows different systems to communicate allowing the customer to maximize the value of their investment across platforms, as long as the other platforms are open.

DS Triple has also embraced software, not just to control the plants operating steps, but to intelligently apply the knowledge that we have as an enabler in order to make use of scientific and technological insights and apply those fine details to processing controls in general.

DS Triple are putting the software to work for our clients, both to ensure faultless execution as well as to enhance the operation of the plant to an extend never achieved before.



DS TRIPLE SATC SYSTEM

The DS Triple UHT plant is designed to yield constant high quality of quality output combined with long run times and a low energy consumption.

To enable this, the hardware it designed to enable a unique concept called SATIC. (Self- Adaptive Temperature Incline Control).

The mission of the SATIC system, in short, is to ensure that the temperature profile from the inlet to the top temperature and down is intact throughout the any production run.

It is imperative to retain the temperature profile as to retain the product quality through correct parameters such as homogenization temperature, pre-stabilization as well as total heat load for the product as well as preserve as much as possible of the regenerative effect throughout the run.

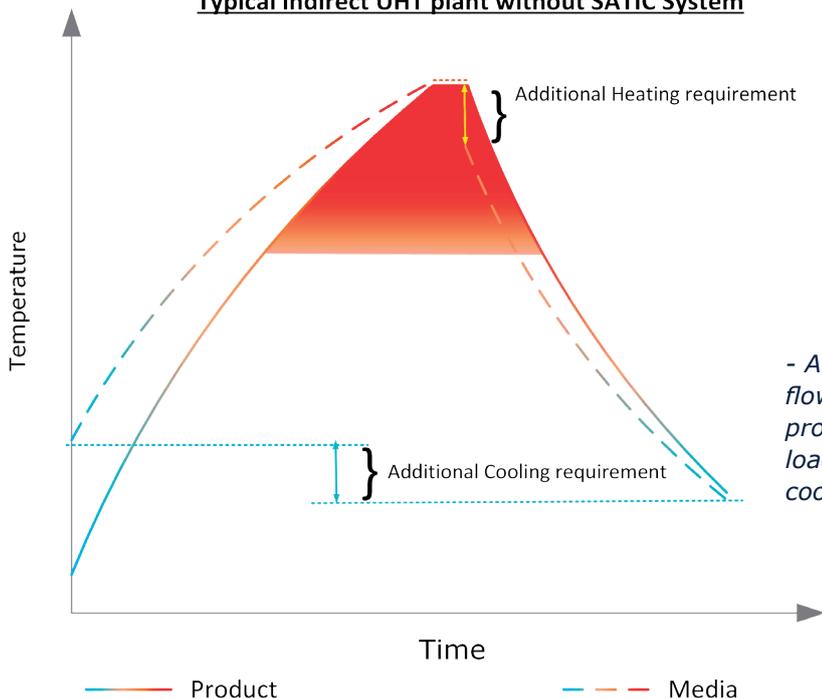
Using a SATIC system means that the water flow is no longer seen as a simple media flow, but rather as an energy stream also known as a 'capacity flow'.

When media (water) flow is being discussed in a UHT plant it is normally understood as a 1:1 flow or 1.1:1, thereby stating that the water flow is simply similar or above the product flow, measured in liters, and at a certain percentage. It is well understood that having a higher flow on the media side is leading to higher energy consumption and higher heat load on the product. (More cooked)

Water is used as the carrier of energy, heat, in the UHT plant, and water a media that holds more energy (Joules/Calories) per gram than the product being treated in the plant.

Milk and cream contains substantial amounts of water and, in addition also some dry matter. The specific heat that it takes to heat (or cool) milk varies to quite a degree from water, as the specific heat for Protein, fat and lactose is much lower than water, even a 1:1 flow will result in a capacity flow with excess energy hurting the regeneration and also the product.

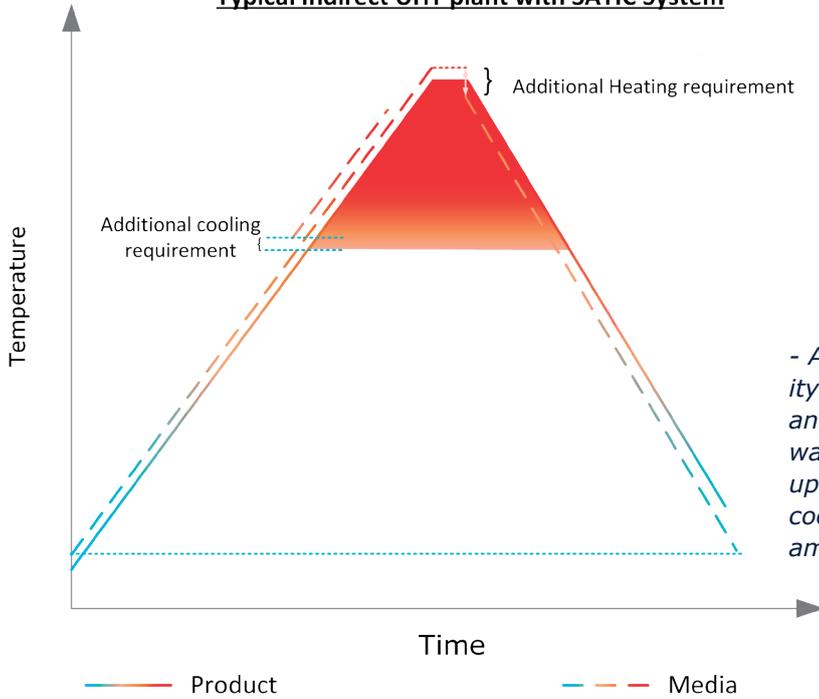
Typical indirect UHT plant without SATIC System



- A plant without SATIC based capacity flow system, showing how the heating profile is off balance, causing excess heat-load on the product, and higher heat and cooling requirements.

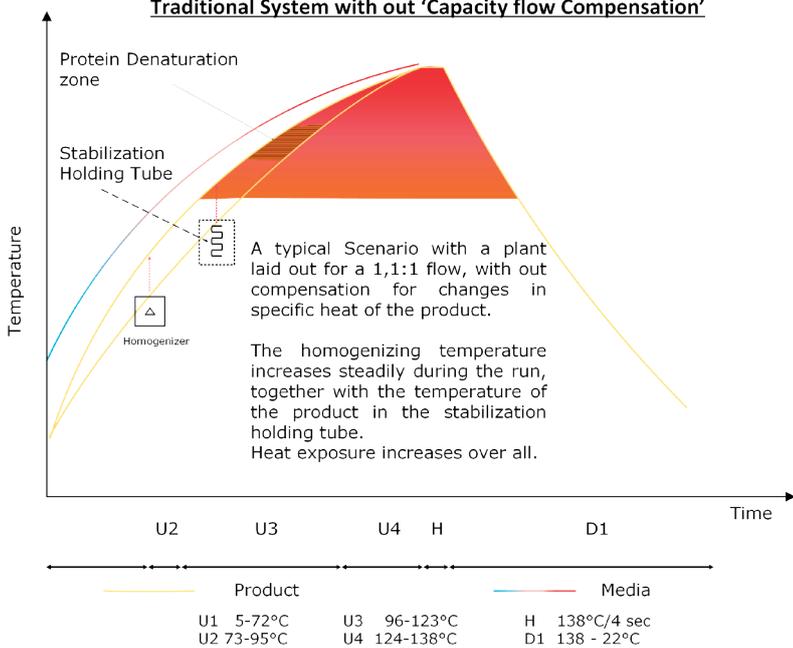
DS TRIPLE SATIC SYSTEM (CONTINUED)

Typical indirect UHT plant with SATIC System



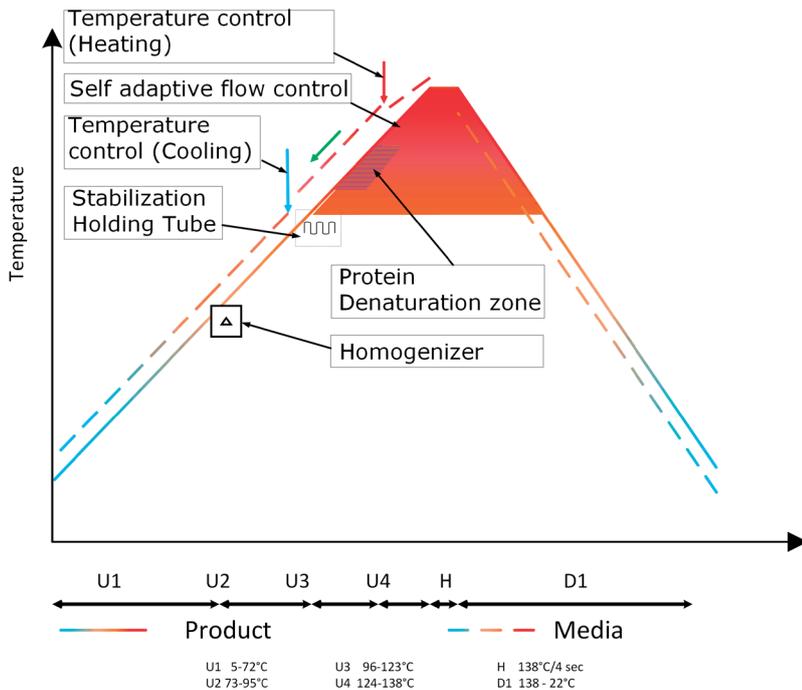
- A SATIC based plant with working capacity flow control where the heat load is less and constant during the run. The cooling water demand is very low, nil in the start-up and later the high level adjustment cooler makes effective use of the small amount of cooling medium required.

Traditional System with out 'Capacity flow Compensation'



»» DS TRIPLE SATIC SYSTEM (CONTINUED)

DS Triple SATIC System deployed.



A SATIC based plant provides stability, as well as flexibility. As indicated by name, 'Self Adaptive Temperature Incline', the system ensures the correct capacity flow from product to product.

This provides unique control of all parameters including one of the most overlooked detail, the temperature incline per time unit between 95 to 123 degrees, providing possibilities to, safely, calibrate the plant for longest possible runs between CIP's.

The system automatically monitors the balance and calibrates the 'capacity flow' to the product along with maintaining the temperature profile constant.

This provides for extended runs, easier CIP and proper monitoring of the heat exchange surfaces in the most sensitive areas.



»» DS TRIPLE P SYSTEM

On top of the SATIC system, DS Triple has developed the PPP system (Pre-emptive Processing Protocol).

As can be seen from the SATIC system, DS Triple has a philosophy of leaving nothing to chance. SATIC controls the plant based on inputs, not on preset fix points, and achieves sublime control over the production run vs the various products that is run on the plant.

The PPP system is the answer to many manufacturers requiring reliability from their plant during more challenging tasks.

On most systems, the risk of 'losing' the plant during start up, due to failure to maintain the temperature is crudely solved by 'bumping' up the sterilizing temperature a few degrees. Most of the times it works, but also, sometimes it fails. The measure is often to increase the 'bump' and thereby create further disturbance

without solving the root cause.

The consequences are unnecessary burn-on from the beginning affecting quality and run-time length.

The PPP system can work in two ways, it either runs with data already loaded and steers the product by adjusting capacity flow in various parts of the plant and preheaters to allow the product to settle into the SATIC system directly.

The second note is with an unknown product, to steer the product into SATIC control with simple preset parameter monitoring. This option can be used as a learning mode with can be loaded as a recipe later.

The PPP and the SATIC systems with is the state of the art for a combination of hardware and software to help ensure effective execution of production plans.

DS Triple Soft Touch systems represent the perfect marriage between technology and the efficient use of modern software, based on experience, deep insight and knowledge based decisions. Know your partner.



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