

**>APV®**



# UHT PROCESSING TECHNOLOGY

**Advanced Infusion UHT Solutions**



**SPXFLOW®**

# WHEN QUALITY, EFFICIENCY AND ESL MATTER

## Helping you achieve your production goals

The dairy, plant-based, food and beverage industries face the challenges of producing complex product compositions, meeting increasingly stringent regulations, and ensuring microbiological safety – while also achieving desired product quality and process efficiency.

SPX FLOW has a continuous program of research and development, which produces leading, innovative technology that is regularly raising the benchmark for UHT systems. Our experience and expertise to help meet these challenges makes us the partner of choice for many world-leading producers.

Stringent quality controls ensure an unrivalled range of UHT solutions comply with the highest international standards for hygiene. Plants are designed for optimum cleanability and to deliver safe, high-quality foods while minimising the use of valuable resources to optimise production efficiency.

Infusion UHT systems are specifically designed, engineered and supplied to meet production goals. SPX FLOW work in partnership with our customers to ensure they get the results they need:

- High degree of flexibility and customised solutions
- High focus on resource efficiency
- Long run time and short CIP/down time
- Minimised energy, water and CIP chemical consumption
- Support in getting new innovative products to the market quickly
- Maintain competitiveness with optimised and efficient process solutions
- Sustained, consistent quality with gentle UHT processing of high viscous and high protein products
- High degree of food safety beyond legal requirements
- Protection of flavours and nutritional components, such as vitamins, for highest quality, premium products.

## Infusion Solutions for individual needs

The highly flexible SPX FLOW Infusion technology is exceptional in its capability to produce premium products. It is designed to provide enhanced product safety, high bacteria spore kill rates and long product shelf lives. The technology produces minimal heat degradation compared with other traditional UHT systems, protecting the fresh taste of products with wide-ranging viscosities from milk through to custards and puddings.

The method of heating a liquid product as free falling strings by means of direct steam in an infusion chamber was introduced in the late 1950s. As one of the pioneers in aseptic processing, SPX FLOW has made a dedicated effort to develop the concept to perfection through its APV brand. The current infusion system is a unique and patented solution which has gained worldwide recognition and prestige.



# INFUSION UHT PLANTS

SPX FLOW Infusion UHT systems use gentle, rapid heating and cooling with accurate holding times to produce products of superior quality with minimal change in composition and taste. Indeed, milk quality is equal or better than standard HTST processed milk. The synchronized flow of product, steam, air and condensate further creates optimum heat transfer and processing efficiency, even with difficult products. The system is very flexible and can be used for a wide range of products covering a broad viscosity range.

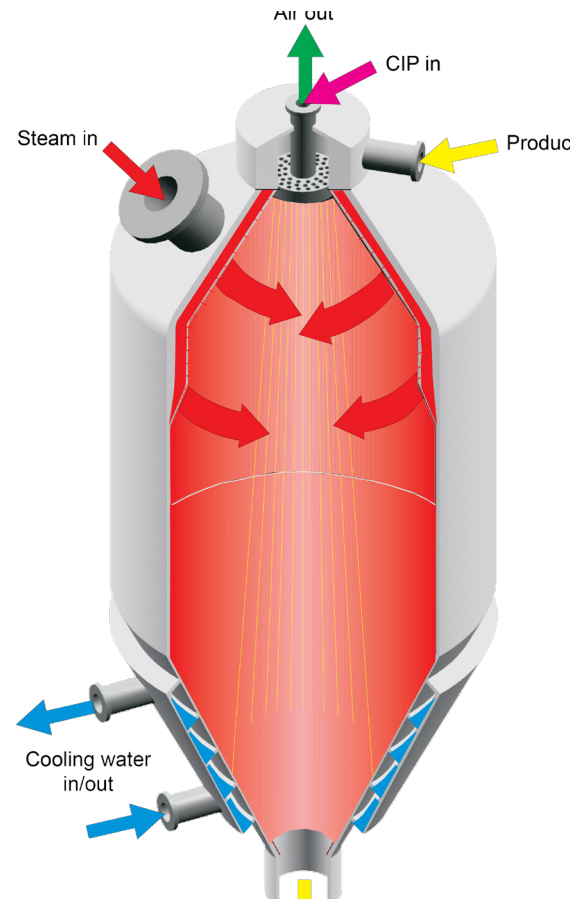
## Advantages of SPX FLOW Infusion UHT Systems

- Gentle and accurate heating in the infusion system
- Extremely accurate holding time: The patented design includes a lobe pump for precise, accurate and variable holding times
- Fast heating (600°C/sec): SPX FLOW is the only company that has references for heating to 157°C in 0.09 seconds
- High bacteria spore kill rate
- Superior product quality with low chemical change and a 'fresh' pasteurized milk flavor
- High production flexibility
- Low fouling rate for long run times
- Long operating time between CIP
- Operator-friendly
- Pre-assembled and factory-tested for assured performance
- Optionally designed to FDA/3A, EU

## Typical Applications

The SPX FLOW Infusion UHT systems offers flexibility in terms of sterilization of a wide range of products, such as:

- |                    |                       |
|--------------------|-----------------------|
| ▪ Milk             | ▪ Chocolate milk      |
| ▪ Cream            | ▪ Soya milk           |
| ▪ Vla              | ▪ High protein drinks |
| ▪ Custard          | ▪ Coffee whiteners    |
| ▪ Pudding          | ▪ Evaporated milk     |
| ▪ Soft ice cream   | ▪ Yoghurt             |
| ▪ Ice cream mix    | ▪ Cheese dips         |
| ▪ Condensed milk   | ▪ Desserts            |
| ▪ Baby food        |                       |
| ▪ Processed cheese |                       |
| ▪ Sauces           |                       |
| ▪ ESL milk         |                       |



# ENERGY RECOVERY SELECTIONS

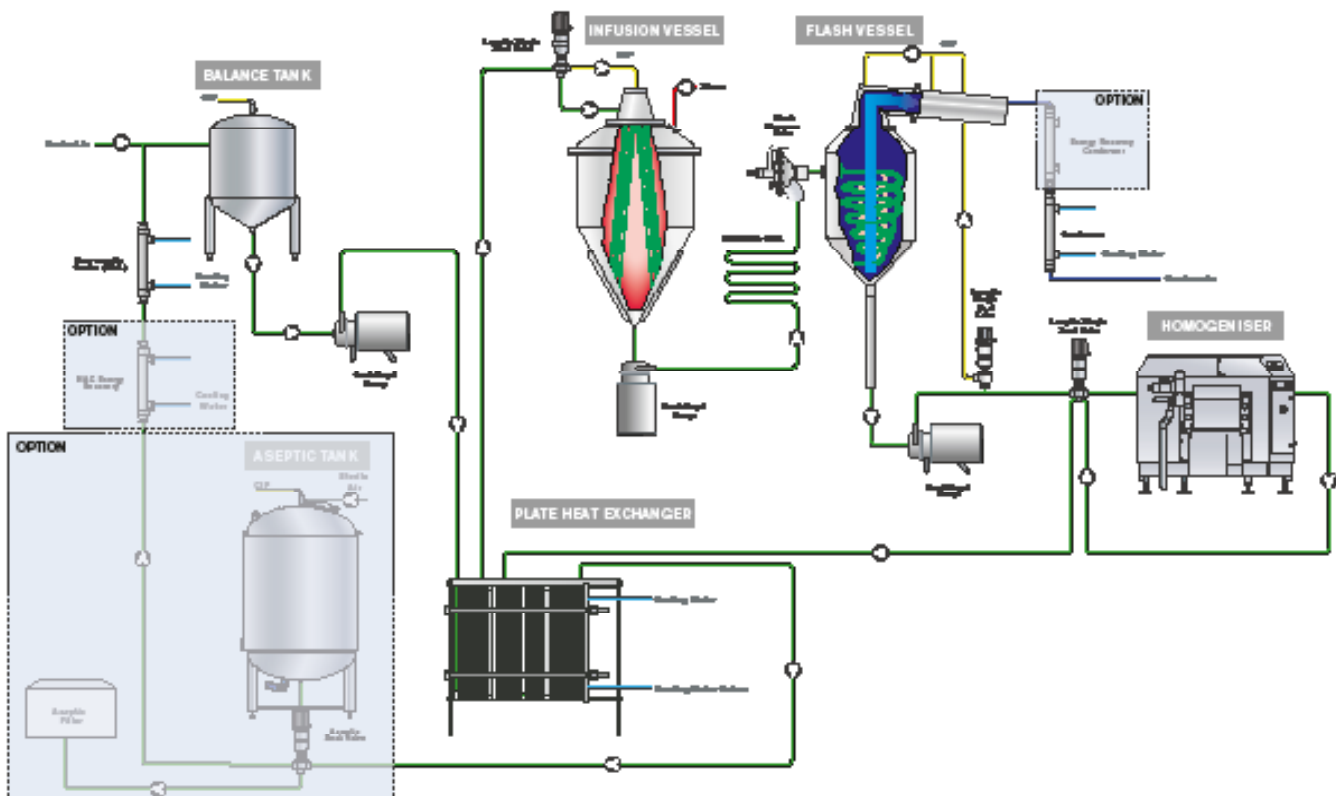


Minimising energy consumption is a priority for the environment and profitability of a business.



SPX FLOW has several options to help optimise energy recovery

- Non-Aseptic Cooler (NAC) with energy recovery of 67% (patented design)
  - Recovery of energy during sterilisation and cleaning
- Insulation of infusion chamber and flash vessel
  - 50mm of insulation covered with stainless steel cladding with a savings of above 90%
- Condensers with energy recovery of 12%
  - Set of condensers that reuse the energy internally or externally of the UHT plant
- Sterile water unit to produce sterile water for the homogeniser with a significant savings
  - System for generating sterile water instead of using condensate
- Hibernation mode during waiting time can produce energy savings over 50%
  - Intelligent energy reduction during hibernation time



# OTHER KEY FEATURES

- Variable capacity
- Standard temperature ranges from 110 – 157 °C with capacities from 80 – 50,000 l/h
- Plate heat exchangers for preheating and cooling
- Combination UHT system provides direct and indirect heating
- F0 kill rate monitoring, logging and set point control

## Premium Add-ons:

- Seamless infusion vessel
- Aseptic tank
- Double balance tank system
- Patented video surveillance inside infusion chamber
- The SPX FLOW Infusion UHT technology can also be supplied as add-on solution to all common UHT systems from other manufacturers.



# CHOOSING THE RIGHT PROCESS

Consumers are increasingly demanding innovative and value-added long-life products, including flavoured milks, functional foods, lactose-reduced milk, various sauces and desserts and products with health benefits such as added vitamins, probiotics etc. These demands are increasing the need for product diversification, product safety and consistent high quality.

The choice of technology is dependent upon factors such as the product specification, viscosity and heat sensitivity.

For cost-effective production of products with desired characteristics, it is essential to make the correct choice with respect to processing system and technology. SPX FLOW knowledge and expertise in this area can help customers select the optimum solution for their business goals.

	Shelf Life	Storage	Application	Taste Profile
<b>Pasteurised Milk</b>	5 to 10 days	Refrigerated	Milk	Fresh taste
<b>Infusion ESL</b>	20 to 45 days	Refrigerated	Milk, cream, ice cream mix, milk shakes	Fresh 'pasteurized' taste
<b>Infusion UHT</b>	3 to 6 months	Ambient	Milk, flavored milk, cream, coffee cream, ice cream mix, custard, milk shakes	
<b>InfusionPlus</b>	20 to 45 days	Refrigerated	Milk, protein drinks	Fresh 'pasteurised' taste
	3 to 6 months	Ambient		
<b>Instant Infusion</b>	Pre-process		Higher viscosity products including baby food & milk concentrate (up to 58% TS) for spray drying	

# PARTNERS FOR INNOVATION

With the support of state-of-the-art Innovation Centres and leading food experts, customers can quickly trial and test processes and recipes to produce optimised results. Innovative systems for freshest tastes, longer life and efficient production.

- Detailed understanding of processes means systems are not over-engineered and offer excellent return on investment
- All systems are supported by a comprehensive support network throughout their lifecycle, from concept to end of life



### Infusion ESL System

The patented Infusion ESL process uses high temperature with extremely short and accurate holding time to produce extended shelf life products, with shelf stability of up to 45 days with cold distribution, that mimic the fresh taste of pasteurised products. Traditional heat treatment processes for ESL milk use temperatures of 125 to 130°C with holding times of 2 to 4 seconds. The accuracy of the Infusion ESL plant enables it to heat the product to 135°C with a holding time of just 0.5 seconds.

#### Application:

- Milk
- Cream
- Ice cream mix
- Milk shake

### InfusionPlus System

The ground-breaking InfusionPlus process is one of the most innovative developments seen within thermal technology for many years. It heats the product up to 157°C in 0.09 seconds, producing a commercially sterile product with the same high quality and fresh taste as pasteurised products.

#### Application:

- Milk
- High protein drinks

#### Clear Advantages:

- Shelf life up to 6 months at ambient temperature storage
- Products with same fresh tastes as pasteurised alternatives
- Very low chemical change

### Infusion UHT System

The infusion UHT system produces exceptionally gentle heating and is designed for very fast heat treatment, with an efficient bacteria spore kill rate and very low chemical change to the product. Standard temperatures range from 110 – 157°C with capacities from 80 – 50,000 l/h.

#### Application:

- Milk
- Flavoured milk
- Coffee cream
- Cream
- Ice cream mix
- Custard
- Milk shake

### Instant Infusion System

SPX FLOW has developed a special patented version of the infusion system to handle high viscosity products, which have traditionally been more difficult to handle in a UHT system. The Instant Infusion system is based on a ultra-short, precision holding time in the infusion chamber and is ideal for use with high fouling products with up to 58% total solids.

#### Application:

- Baby food
- Milk concentrate for spray drying (maximum 58% total solids)

#### Exceptional performance:

- Up to 70% less vitamin loss comparable to existing technology
- Precision-controlled variable holding time down to 0.5 to 0.09 sec.
- Very low chemical change





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