SPXFLOW

Dairy Suppliers Day

Instant Infusion™

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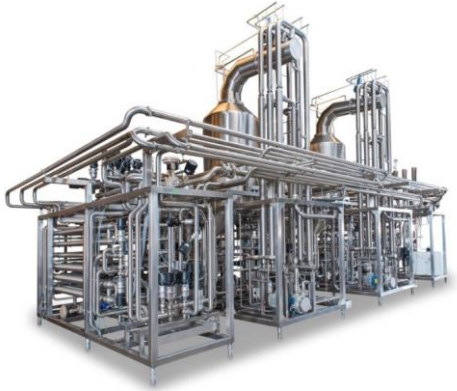
Agenda

Topics
○ Instant Infusion introduction
○ Main benefits of the SPX Instant Infusion™ Enhanced system model year 2016
○ Evaporation and spray drying
○ Instant Infusion Process options
○ Comparison of various pasteurisation methods
○ Reference Installations



What is Instant Infusion?

- Instant Infusion is a unique APV system, developed to kill bacteria and bacterial spores in dairy based infant foods and other concentrated dairy formulations
- The system is designed to give a high kill rate of the bacteria and a very low chemical change to the product
- The system is designed to be installed at the inlet of a spray dryer
- Instant Infusion patented in 1992; 18 Instant Infusion reference units since 1996, majority of installations for Infant Formula.

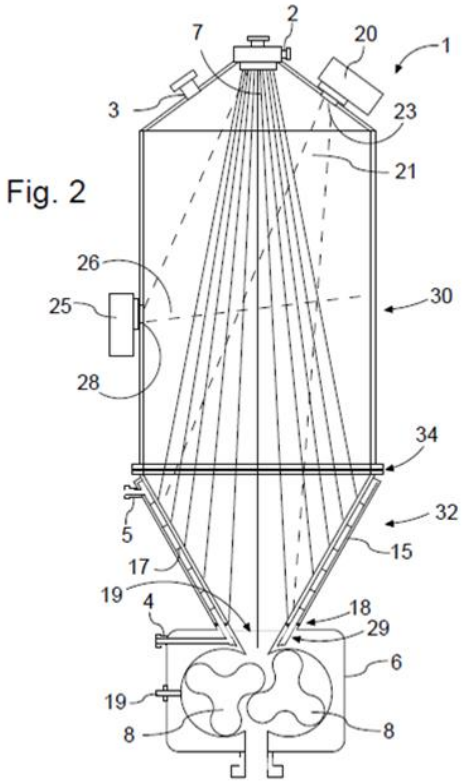
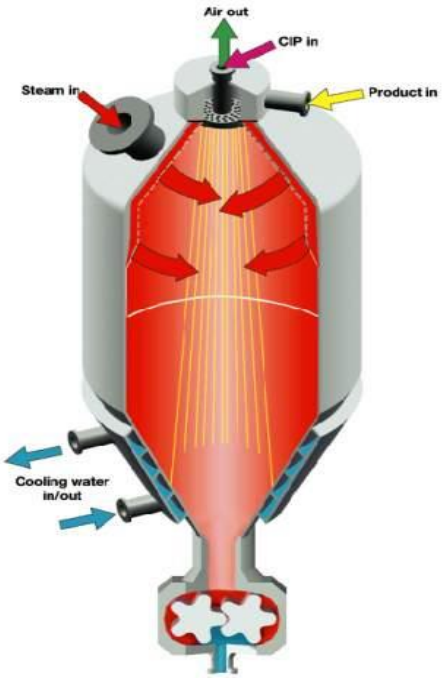


Fig. 2

Main benefits of the SPX Instant Infusion

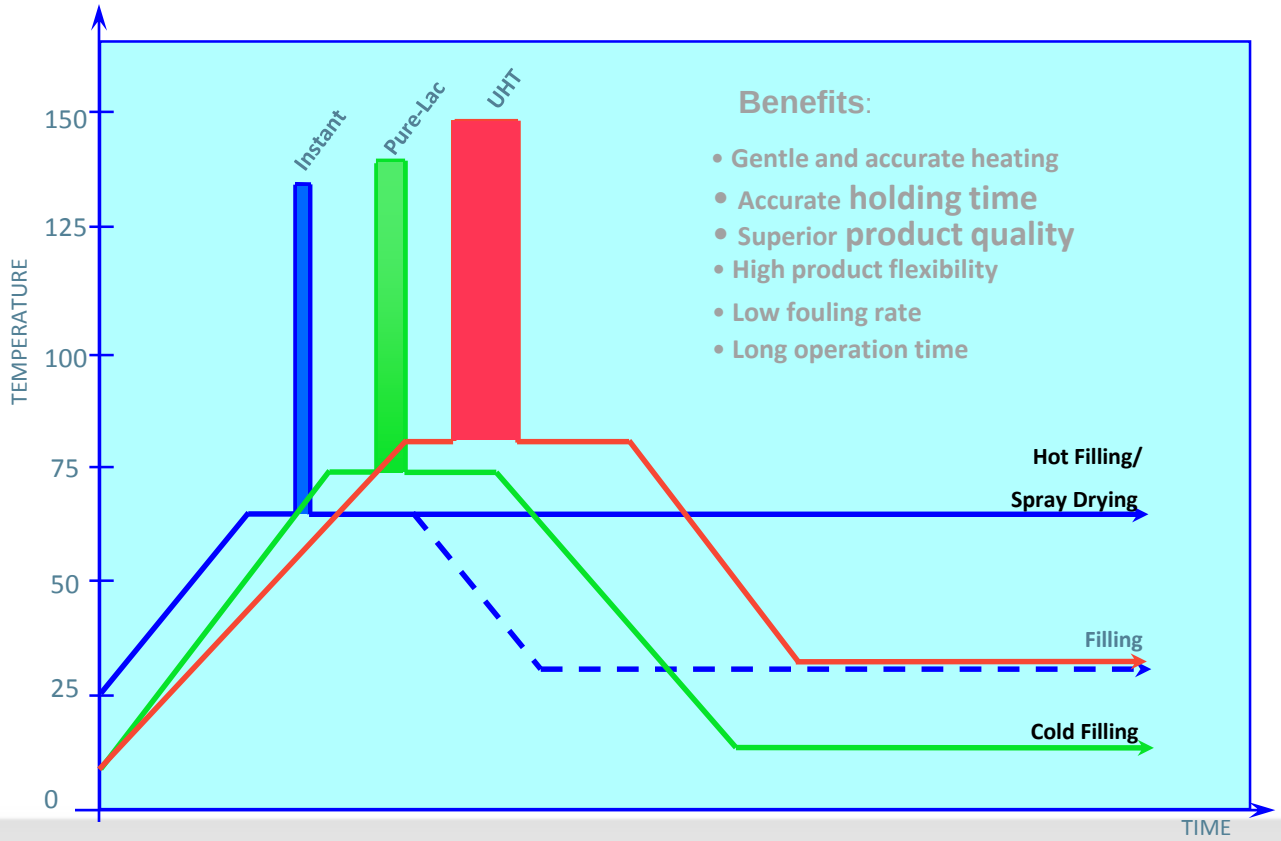


Flash cooling

- Improved safety in production of Infant Formula (eliminate Clostridium botulinum)
- Lower vitamin loss in the heat treatment process
- High kill rate of bacteria spores
- Long running hours
- Processes products with high total solids
- Installed just before dryer inlet
  = eliminate risk of bacteriological growth from evaporator

- Faster heating, shorter holding and faster cooling
  = higher kill rate and less chemical change in product

Various temperature profiles for APV direct infusion



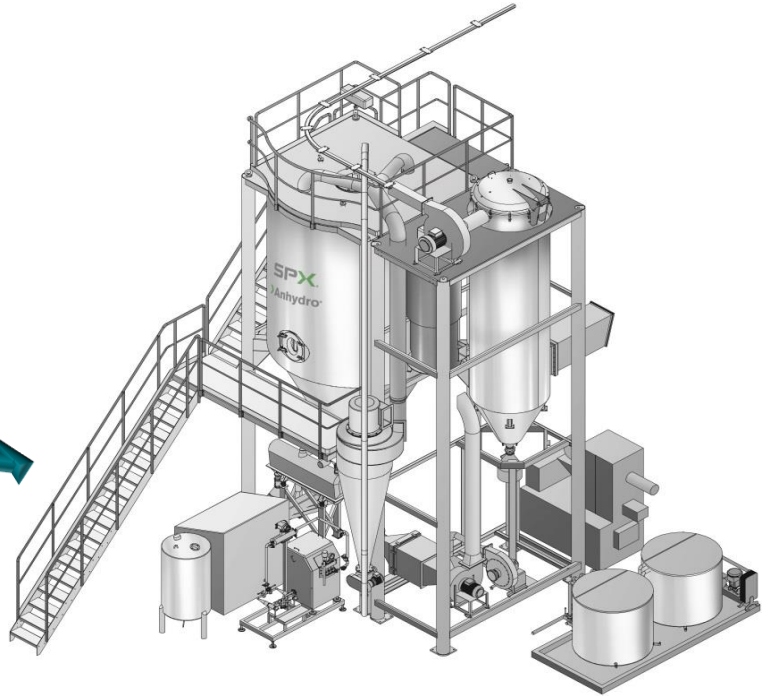
Comparison of traditional pasteurisation and APV's Instant Infusion

	"Traditional process"	Instant Infusion™	Instant Infusion™ Max. performance
Temperature / Holding	**124°C / 3 sec.**	**133,5°C / 0,3 sec.**	**148°C / 0,5 sec.**
B* value Assumptions: B* 1 => commercial sterility	0,03	0,03	0,92
Spore kill (log reduction) Bacillus cereus: Z = 9,7°C; D = 2,3 sec.	3	3	168
C* Value Destruction of Vitamin B1 (Thiamin9	0,06	0,03	0,05
Total Beta-Lactoglobulin denaturation	30%	8%	18%

Direct Mixing, Instant Infusion and Spray Drying

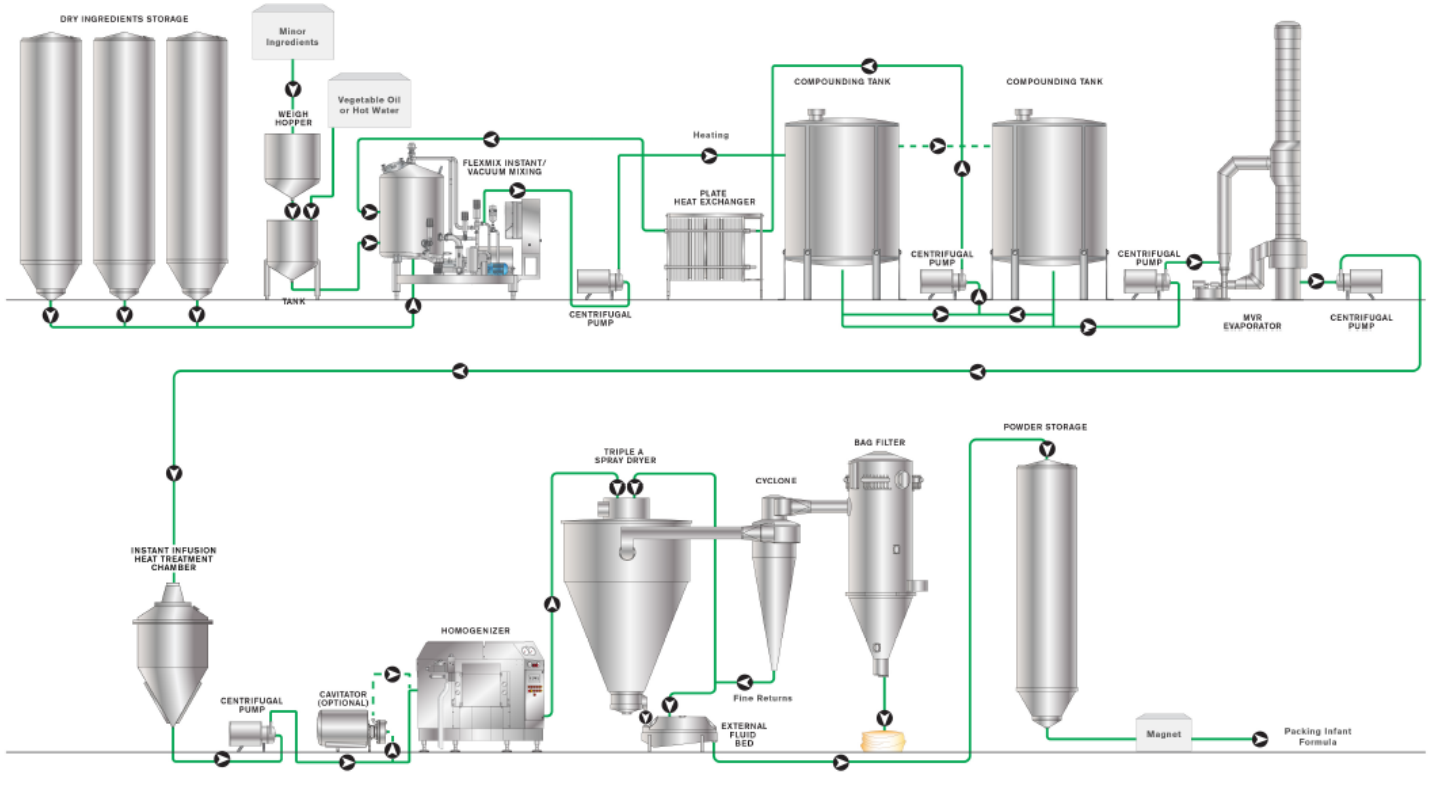
FlexMix Instant, Vacuum mixing

Instant Infusion

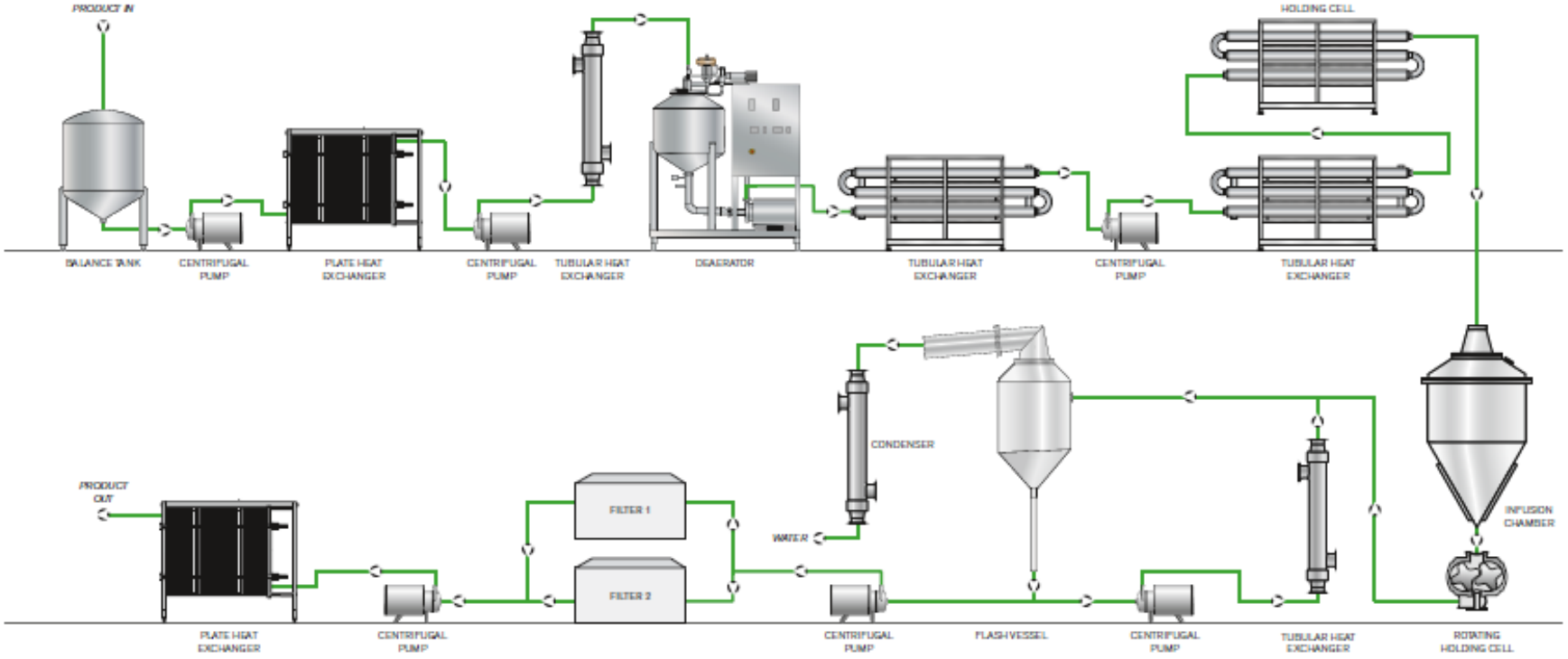


Dryer

Mixing, Evaporation, Instant Infusion and spray drying



Instant Infusion *Enhanced* w/ AVAP™ Option



INFUSION PLANT

Danish patent application No. PA 2014 00410

By providing a seamless transition between the bottom section and the pump and by providing cooling around the bottom section and all the way down to the pump fouling and burn-on is reduced and results in longer and safer production time between cleanings, which significantly increases production efficiency of the infusion heat treatment plant.

By providing a camera with an angle of view covering at least a portion of the bottom section transition fouling and burn-on can be instantly detected. This means that the operation can continue until fouling and/or burn-on is detected and the running time before cleaning does not have to be set at a preventively short interval, thereby providing longer and safer production time between

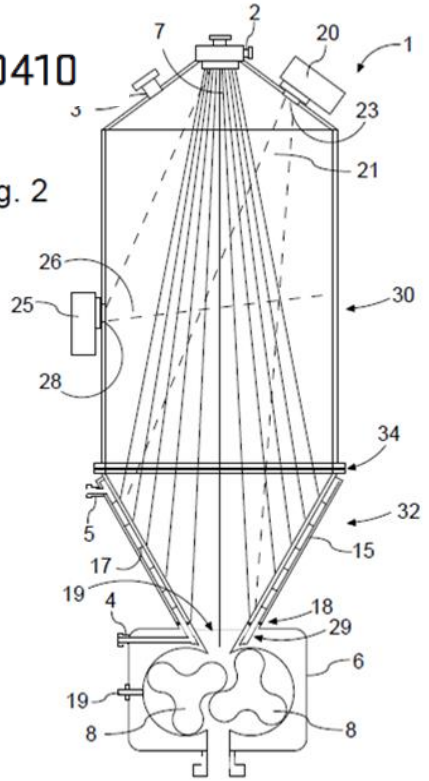
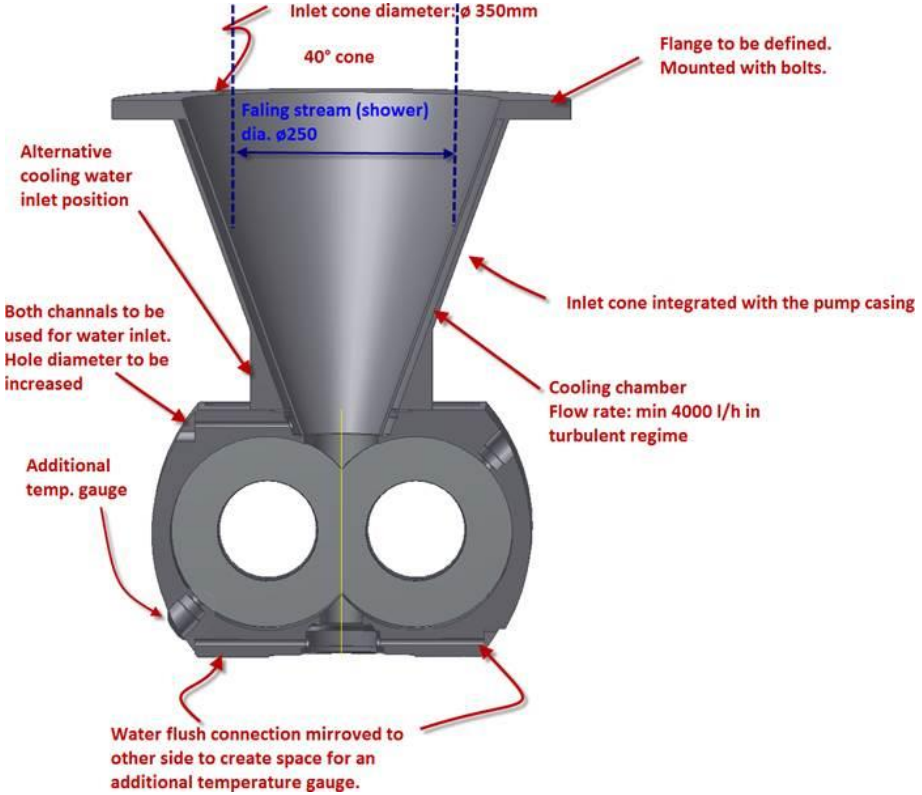
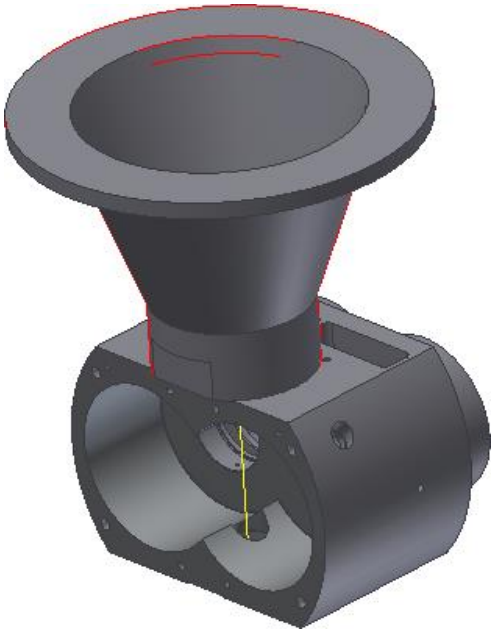


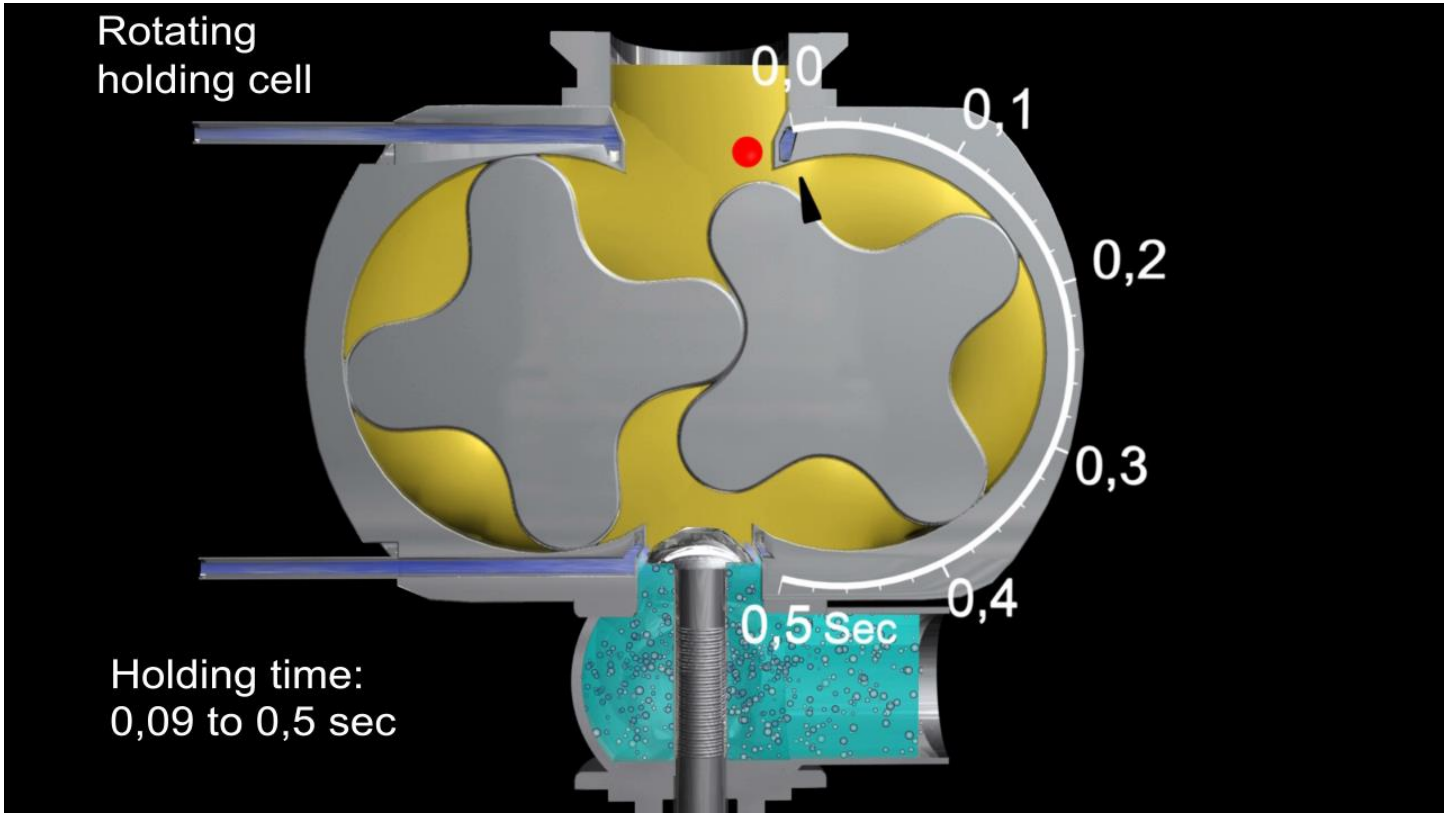
Fig. 2

TWRHC Rotating Holding Cell, *Enhanced*





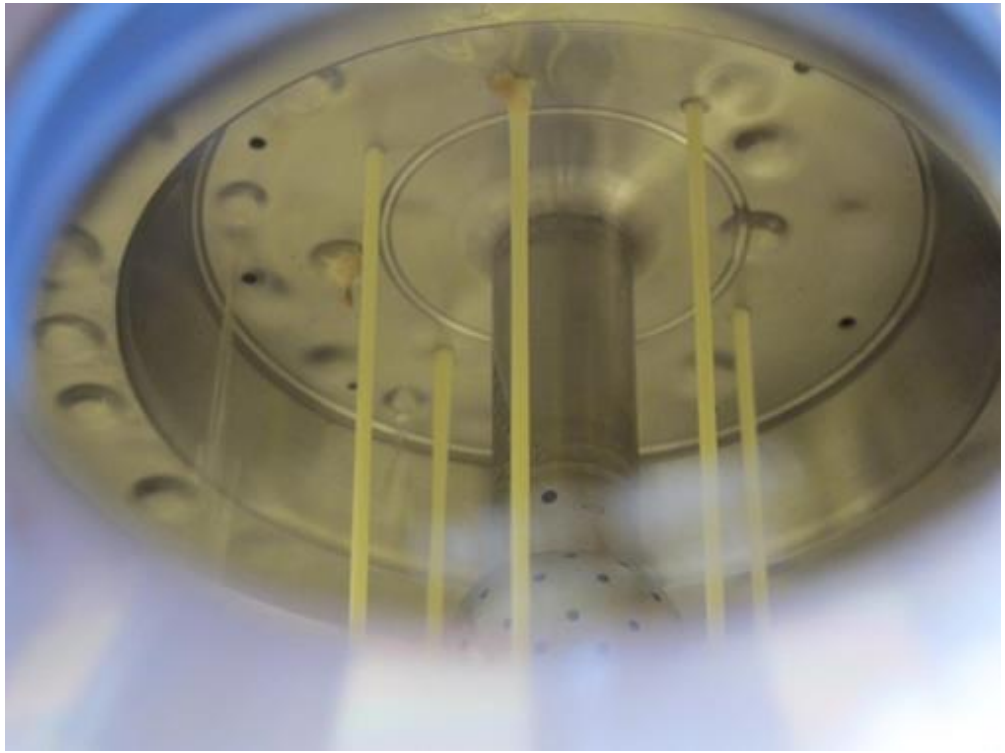
TWRHC Rotating Holding Cell



High TS IF at Innovation Centre UHT plant

Camera with constant monitoring of nozzle pattern

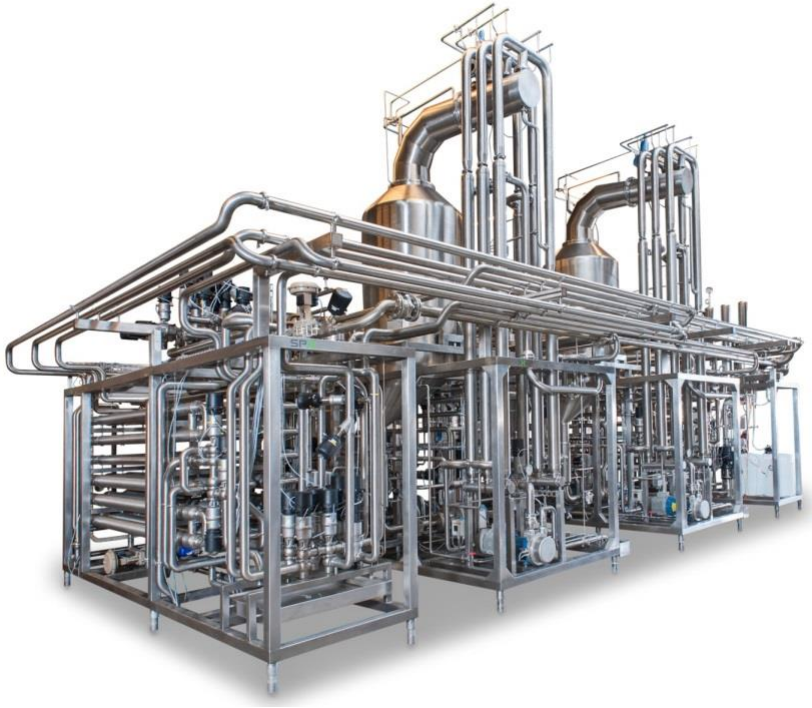
High TS IF at Innovation Centre UHT plant



Nozzle view

Cone view

Recent reference Installations

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