UHT. PROCESSING

REDA
Food Processing Plants

Aseptic Technology

REDA U.H.T. PROCESSING LINES

The most reliable technology for your products

Introduction

The UHT treatment (Ultra High Temperature) is a modern and innovative technological process that consist in carrying a foodstuff fluid to an high temperature and after a short holding time cooled quickly up to room temperature.
The product , sterilized, is the filled in aseptic conditions.
So treated products keep freshness, taste, and nutritional value similar to the fresh products but with the very great advantage that can be kept at room temperature for several months, or year, without the use of conservancies.

The milk by-product, but more generally the products with PH>4,5 must be treated at the temperature of approximately 140°C for few seconds eliminating, further to the bacterial charge, also the thermo resistant spores.
The high acidity products, PH<4,5, can be processed at lower temperature, between 90°C and 121°C, as the thermo resistant spores survived shall remain innocuous blocked in the acid ambient.
The choice of the treatment temperature, between 90°C and 121°C, and the holding time from 30 to 120 seconds shall depend from the type of products.

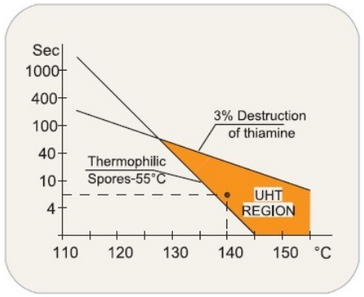

Fig.1)
In the milk temperature time diagram the zone "UHT REGION" shows the area inside which it is possible to operate to have the certitude that product is sterilized.

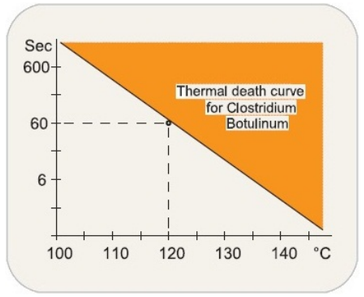

Fig. 2)
The clostridium Botolinum is the most dangerous micro-organism present in the food fluids.
The diagram shows for each temperature the time necessary to destroy this micro-organism.

REDA UHT PLANT

REDA ATR-UHT plant (Aseptic Tubular Reda-UHT) represents the new generation of sterilization plants where have been applied the more advanced techniques of thermal exchange and controlled operation through full automation. This processing equipment combines high efficiency with great versatility and is the preferred choice of many dairies and other food producers for UHT processing of: milk, flavoured milk products, cream, coffe cream, ice cream mix, dairy desserts, yoghurt drinks, soy milk, baby foods but also suitable for other applications such as fruit juices and nectars, fruit purees and concentrates, tea and other soft drinks.

The tubular exchanger unit is composed by modules of 4 mt. length made in stainless steel AISI 316L, connected in series with special clamp connections, permitting a fast and easy inspection of internal pipes. Each module contains the thermal exchanger pipes that may have internal corrugated design to improve the thermal exchange performance.
This configuration makes possible to process products with particles or fibres contents in suspension without any risk of occlusion. Very viscous products such as creams or fruit purees can be treated without any inconvenience as well.

Benefits of REDA UHT plants:

- Great production flexibility.
- High thermic regeneration effect (up to 87%).
- Working autonomy up to 16-20 hours with milk and up to 120 hours with juices.
- Suitable to work with high operating pressures.
- Product quality and safety.
- Minimal product losses.
- Efficient production.
- Minimized consumption of energy and other resources.
- Very low maintenance costs.
- Long-term competitiveness.

The product flows inside the thermal exchange pipes only and never outside. To protect flavour of the product, gentle UHT treatment is achieved by a minimum temperature difference between the heating medium and the product, protecting delicate aromas and flavours. Rapid cooling to package temperature is achieved through thermic regeneration system (sterile water recirculation) which cools the sterilized product down stream, transferring the heat to the unprocessed product.
All REDA ATR UHT plants have a very compact design and are supplied pre-assembled and tested. Consequently the time necessary for the connections and the start up will be very short.
The full automation makes userfriendly operation and grants constant high quality and the sterility of the treated products.

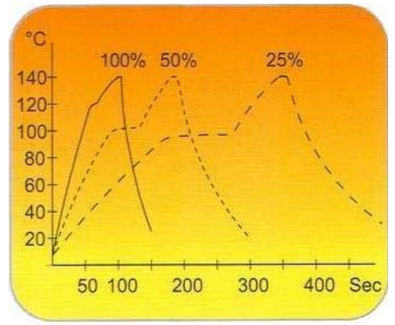

Fig. 3)
The very restricted temperature -time diagram over 80°C grants good UHT products.
Reduced flows of the 50% and up to 25% are possible by sterilization section choosing system and modulating of the thermal regeneration effect.

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DEGASER

With the milk by-products the under-vacuum degaser eliminates the dissolved gases which may give bad smell. For products like juices, purée and nectars the unit is useful to eliminate the englobed oxygen that is responsible of the product oxidation, which causes changes of colour and losses of product nutritional value.
By a condenser, cooled by low temperature water, the aromatic parts are recovered while the incondensable gasses, including the oxygen ,are extracted by the vacuum pump.
Inside the under-vacuum chamber the product is distributed in a thin film to optimize the degasing effect (max 0,3 mg/lt Oxigen residual).

HOMOGENIZATION

The homogenizing action grants a dispersion of particles on the mass (or fat globules in case of milk), avoiding phase separation during the conservation. Usually UHT milk is homogenized at 220/250 bar during the heating phase. The cream can be aseptically homogenized during the cooling phase in order to break the protein aggregates created by the high temperatures.
By changing homogenization pressure is possible to obtain products with different consistence/texture.

AUTOMATION

The Automation purpose is to enable easier and more safe the plant operation and furthermore grants a constant and high quality. REDA ATR-UHT includes a userfriendly, PLC-based control system providing a complete overview and automation of the entire process. Temperature, pressure and all other parameters, can be easily setted at all points in the process, giving complete process control at every stage. Automation of the entire process reduces the risk of operator error, provides production reports, data logging and full traceability. Finally, remote control room and tele-service options are also available.

REDA UHT PLANT GUARANTEES

1. QUALITY:

- Bacteriologic effect B = 1.44
  Thermophilous spore reduction in the UHT milk shall be: $10^{9 \times 1.44} = 10^{13}$ (optimal effect).
- Chemical effect C = 0.50
  Thiamine percentage damaged in the UHT milk shall be: 3 x 0.50 = 1.5% (insignificant loss).
- Lactulose found in the UHT milk shall be lower than 30mg/100ml (optimal value).

With the above parameters UHT milk obtained is similar to a pasteurized milk.

2. STERILITY:

- Constant logging of process temperature (the product leaves the unit only if sterilized).
- The thermic regeneration comes through a recirculation auxiliary circuit of sterile water.
- There is always overpressure on the aseptic side, that comes constantly stored with low overpressure alarm.

REDA UHT unit grants the certitude that the processed product is sterilized.

REDA offers four different UHT technologies for its aseptic process lines:

• APR-UHT	Indirect heating via plate heat exchangers
• ATR-UHT	Indirect heating via multi-tubular heat exchangers
• DIRECT ATR-UHT	Direct heating via steam injection
• STERIFLEX	A combination of indirect-direct heating

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