

# UHT PROCESSING

**REDA**  
Food Processing Plants



## Aseptic Technology



# UHT PROCESSING LINES

## Aseptic processing for safe products

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 sterilized product is then filled in aseptic conditions. Products treated in this way keep freshness, taste, and nutritional value similar to the fresh products but with the great advantage that they can be stored at room temperature for several months, or year, without the use of preservatives. The milk by-product, but more generally products with PH>4,5

must be treated at the temperature of approximately 140°C for few seconds eliminating, not only the bacterial load, but also the heat-resistant spores.

Products with high acidity, PH<4,5, can be processed at lower temperature, between 90°C and 121°C, as the heat resistant spores survived shall remain harmlessly trapped in the acid environment.

The choice of the treatment temperature, between 90°C and 121°C, and the holding time from 30 to 120 seconds shall depend on the type of products.

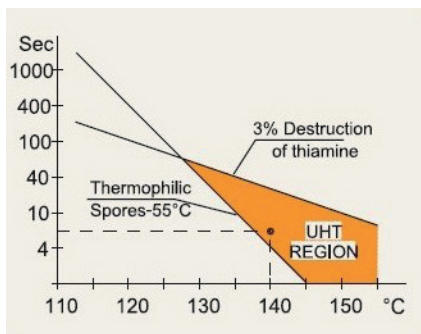


Fig. 1

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.

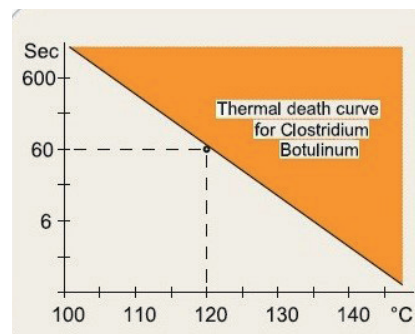


Fig. 2

The *clostridium Botulinum* is the most dangerous micro-organism present in the food fluids.

The diagram shows for each temperature the time necessary to destroy this microorganism.

## UHT PLANT

REDA ATR-UHT plant (Aseptic Tubular Reda-UHT) represents the new generation of sterilization plants in which the most advanced techniques of heat exchange and controlled operation through full automation have been applied. This 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 it is also suitable for other applications such as fruit juices and nectars, fruit purees and concentrates, tea and other soft drinks.

The tubular heat exchanger unit consists of 4-metre long modules made of AISI 316L stainless steel, connected in series with special clamp connections, which allow fast and easy inspection of internal pipes. Each module contains the heat exchanger pipes that may have internal corrugated design to improve the heat exchange performance. This configuration makes possible to handle products with particles or fibres contents in suspension without any risk of clogging. Even very viscous products such as creams or fruit purees can be processed without any inconvenience.



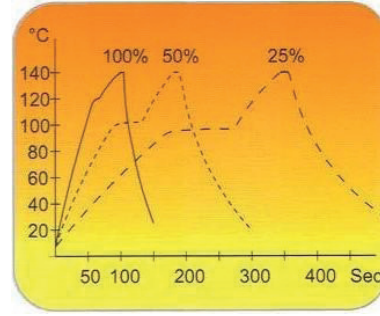
### Benefits of REDA UHT plants:

- 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 only flows inside the heat transfer tubes 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 thermal regeneration system (recirculation of sterile water) that 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 required for connections and the start up will be very short.

Complete automation makes operation user-friendly and guarantees 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.



## DEGASER

For 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 for product oxidation, causing changes in colour and losses of nutritional value.

By a condenser, cooled by low temperature water, the aromatic parts are recovered while the non-condensable gasses, including oxygen, are extracted by the vacuum pump.

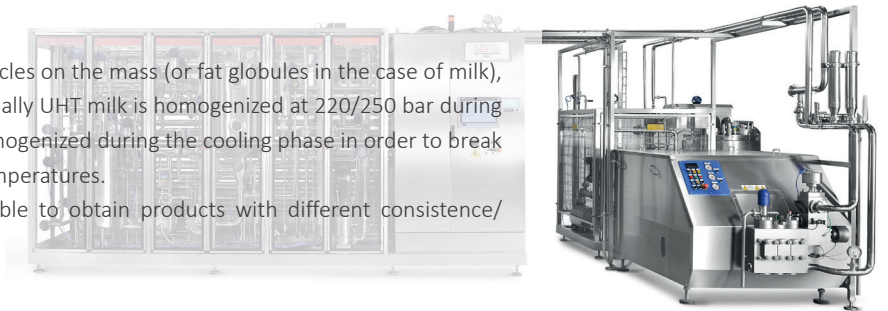
Inside the under-vacuum chamber the product is distributed in a thin film to optimize the degassing effect (max 0,3 mg/lit residual oxygen).



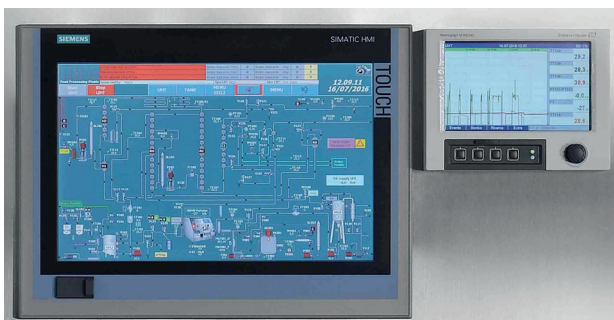
## HOMOGENIZATION

The homogenizing action ensures dispersion of particles on the mass (or fat globules in the case of milk), preventing phase separation during the storage. 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 down the protein aggregates created by the high temperatures.

By changing the homogenization pressure is possible to obtain products with different consistence/texture.



## AUTOMATION



The purpose of automation is to make plant operation easier and safer to guarantee constant high quality. REDA ATR-UHT includes a userfriendly PLC-based control system that provides a complete overview and automation of the entire process.

Temperature, pressure and all other parameters, can be easily set at all points in the process, ensuring complete process control at every stage.

Automation of the entire process reduces the risk of operator error, provides production reporting, data logging and full traceability. Finally, remote control room and assistance options are also available.



# REDA GUARANTEES

## 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:  $3 \times 0.50 = 1.5\%$  (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.

## 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	Multifunction system with indirect-direct heating



Remark:

The technical data, drawings and pictures contained in this brochure are indicative and not binding.

We reserves the right to change specifications of the product without prior notice or liability to third parties.

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