

STALAM



“RF” PASTEURISATION AND STERILISATION OF LIQUID AND PUMPABLE PRODUCTS

The food industry is nowadays dealing with both the increasing attention of consumers to **natural taste, flavour and functional properties of food**, and with **ever stricter food safety regulations** set out by the international authorities.

The need for shelf-life extension technologies able to fulfil these two apparently contrasting tasks drove STALAM to the development of the **“RF/L” equipment for in-line continuous pasteurisation and sterilisation of liquids, solid-liquid mixtures and high viscosity pumpable products**. The use of Radio Frequency fields (at 27.12 MHz) for this application represents today a real alternative to the conventional thermal processing methods. The reason why several European leading fruit and vegetable processors decided to adopt this technology resides in the **complete elimination of the usual issues**



“RF/L 30 kW” equipment for the pasteurisation and sterilisation of viscous liquids.



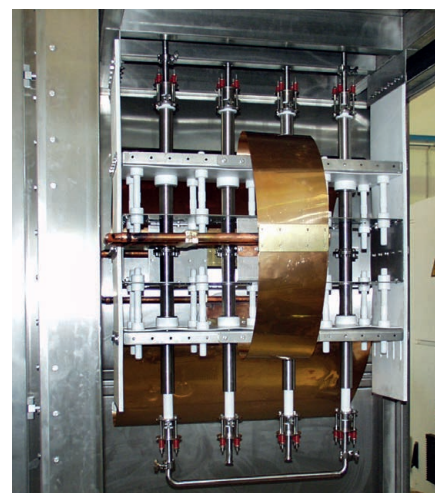
“RF/L 85 kW” equipment for the pasteurisation of fruit preparations for yogurt.

associated with scraped surface, tubular and plate heat-exchangers.

The fluid substrate to be treated is continuously pumped through one or more Teflon tubes having a suitable diameter. The tubes are placed between electrodes, specifically designed depending on the product's characteristics. The product is directly heated by the RF field, with a combination of dielectric and resistive heating. The intensity of the electromagnetic field, and the consequent heating rate, are controlled by means of a variable capacity coupling circuit. **Heating rates from 1 - 2°C/sec** (for highly viscous liquids containing suspended solids) **up to 50 - 100°C/sec** (for low-viscosity liquids with no particulates) are achievable uniformly within the bulk of product, **enhancing the thermal inactivation effect on microorganisms, spores and enzymes.**

Main benefits of the "RF/L" technology

- Rapid and uniform temperature increase within the product, also in the suspended particulates of any dimension, hence with no risk of over-processing the liquid
- Microbial inactivation at lower temperatures and in shorter time compared to conventional thermal processes
- Better preservation of the sensorial, chemical and physical characteristics of the product, including the structural integrity of solid particulates
- Reduced use of additives such as colours, flavours, thickeners, etc. normally used to compensate for product degradations caused by conventional thermal processes
- Instantaneous heat input and process parameters control
- High operational flexibility
- Modular construction, multiple units can be installed in-line to achieve higher production capacities
- Easy cleaning, no crusting effect thanks to no contact with any heating element, and low maintenance costs
- Reduced factory floor space requirement
- Better working environment
- CIP system can be used for washing
- PIG system can be used for in-line change and recovery of the product
- The equipment sterility can also be maintained in stand-by condition



Typical applicator for low viscosity liquids (flow rate about 2000 l/h).

FLOW RATES		ΔT (temperature jump)			
RF generators	Tubes in the applicator	20 °C	40 °C	60 °C	80 °C
40 kW	2	1500 kg/h	750 kg/h	500 kg/h	350 kg/h
85 kW	4	3300 kg/h	1650 kg/h	1100 kg/h	800 kg/h
150 kW	6	5800 kg/h	2900 kg/h	1950 kg/h	1450 kg/h

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