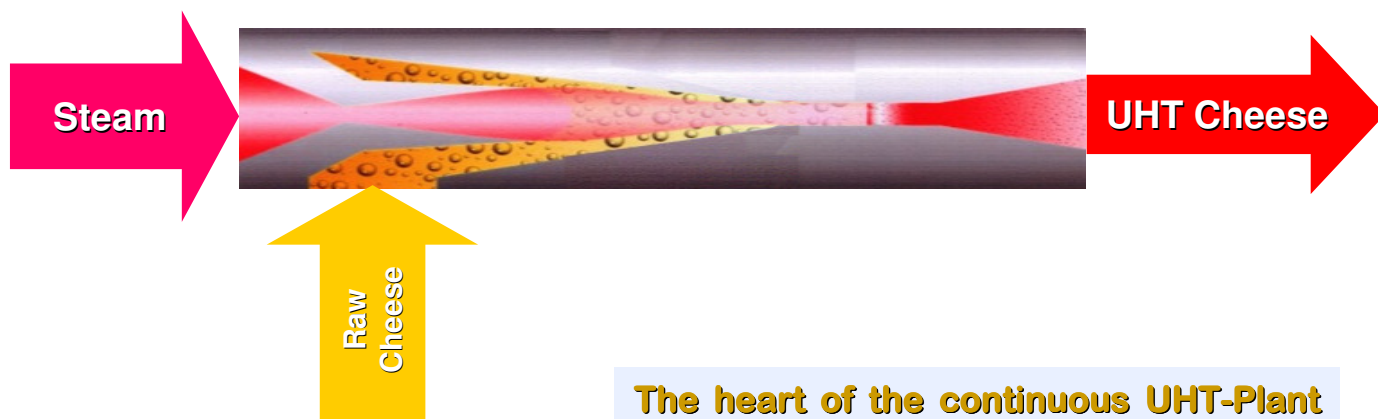


UHT-Processed Cheese Plant

Using MAKLAD Supersonic Shockwave / Direct-Steam - Technology



The heart of the continuous UHT-Plant is the patented MAKLAD-INJECTOR.

It is responsible for the melting, homogenising and UHT-heating of the cheese mixture with steam, at supersonic shockwave conditions.

Because of the MAKLAD-Injector's proven perpetual operation time of more than 72 hours, the use of a second line, respectively, two parallel circuits – as mandatory in competitors' process-cheese-plants – is **not** required.

The complete MAKLAD UHT-cheese plant consists of a pre-heating section (tube-heat-exchanger), in which the cold cheese-mix is being preheated to approx. 70°C by means of ambient vapour, which is generated by the vacuum cooler. The pre-heated cheese-mixture is being heated up to 145° C by the MAKLAD-Injector, by direct-steam injection, and in one process-step. The cheese-mixture moves through the heat-retaining-zone, where the clostridia-spores are being inactivated.

After passing the heat-retaining-zone, the cheese is continuously cooled down to approx. 90°C, by expansion-cooling, under vacuum-conditions. The ambient vapour generated by the tube-condenser (exhaust vapour) is utilized for preheating the raw-cheese-mixture in the tube-heat-exchanger. Ambient/exhaust vapour generated in this process is transformed into condensation in the tube condenser, by using cold water, then conveyed by a vacuum pump to the water-supply-tank.

After the UHT sterilization, the processed cheese-mixture is extremely liquid and not suitable for filling or packing. Therefore, the viscosity is increased to the desired level in the MAKLAD creaming-tank, by using controlled mechanical agitation and monitoring by a viscometer.



Contrary to competitive process-cheese-plants on the market, a separate dynamic-tube-mixer is **not** required, because the MAKLAD-Injector guarantees uniform mixing and homogenisation of the cheese and steam condensation. The entire system is cleaned automatically by a CIP-System.

Possible foreign objects in the cheese product can be removed by a duplex product filter. Energy savings up to 70%, compared to competitive systems, can be achieved by heat recovery, utilizing the MAKLAD-Technology. For the processing-steps, MAKLAD offers a wide range of machines, such as Creaming-Tanks, CIP-Technology and complete Processing-Control.