SALT BATH CLEANING FILTERS FOR CHEESE

Clean processes - Continuously
THE TOTAL FILTRATION APPROACH

Filtration Group has an extensive product range. Our options range from filter components like filter elements, cartridges, filter housings and modules for large system installations. Tell us your application, and we will advise which product would fit best to support your application.

Our Heritage

With over 70 years of experience in the application of horizontal and vertical Pressure Leaf Filters, Cricket Filters and several other types of filters, Amafilter Group provided a unique spectrum of filtration and separation solutions.

MAHLE acquired the Amafilter Group in 2008, adding the expertise, synergy of technology and filter products of Amafilter, LFC, Nowata, Vanpipe and Eurofiltec to its industrial filtration portfolio.

Late 2016 Filtration Group completed the acquisition of the industrial filtration business of MAHLE. This acquisition gives customers more choice and flexibility in how they can utilize filtration to make their environments cleaner, safer and more productive.
Your Partner in Filtration

We understand our customer's increasingly demanding and complex process and environmental requirements. Drawing from one of the industry’s broadest in-house technology bases, our market specialist application engineering teams are able to design a total filtration solution for you. We are globally positioned with production facilities and regional sales offices in Europe, the USA and Asia. Additionally, in many countries we have agents and distributors.

We believe in partnering with our customers to provide total filtration solutions throughout the life of your filters. Our laboratory can help to optimize your filtration process and streamline your efficiency. We offer a complete design, testing, commissioning and service together with full customer support. We also supply filter spares, elements, leaves and equipment upgrades for most types of filtration equipment.

Quality and cleanliness of product and plant are the basis of hygienic operation

Pharmaceutical - and food processing industries place highest requirements on process quality, cleanliness, systems reliability and products quality. In this respect, our process filtration solutions are used, for example, in the production of sugar, cocoa or edible oils, for the removal of activated carbon, catalyst recovery or for quality improvement.

They filter the finest particles and contaminations from the products and contribute effectively to maximum hygiene, quality and product recovery.

Food and Beverages

In most processes of the Food and Beverage industries large volumes of products need to be handled. The quality and cleanliness of both the product and the plant are paramount to hygienic operation and process. Filtration Group offers solutions for the different requirements of individual manufacturers, offering efficiency and economy together with reliability.

Our extensive product range can be utilized for all areas of the food and beverage market, ranging from coarse clarification to sterile filtration, for the removal of microorganisms. Sterile conditions allow the manufacturer to improve shelf life, consistent quality and reduction in the addition of preservatives and protection of the final product.

Main applications

- Edible oil
- Cold pressed oil
- Sugar & sweeteners
- Cheese brine
- Cocoa
- Beer, wine, soft drinks
- Spirits
- Mineral water
Introduction - Salt Bath Cheese Filtration

The cheese is salted in a salt bath with a salt concentration of typically 18 - 20 % for hard cheese and 16 - 18 % for soft cheese. This is to improve taste, structure and shelf life.

The average residence time in the salt bath is:
- 3-5 days for e.g. Emmentaler
- 1-3 days for other hard cheeses
- Only several hours for Mozzarella

The salt bath needs to be cleaned from time to time because it gets contaminated by bacteria, yeast, molds, proteins and small particles of cheese. The salt bath must be very clean and hygienic to produce cheese of high quality. Cleaning the salt bath can be done by either heating or filtration. We recommend to filter the salt bath because:

- Chemically conditioning the salt bath is not allowed.
- UV disinfection is not successful on a large scale
- Centrifuging will give problems due to corrosion. Spare parts for the centrifuge are very expensive.
- If you clean the salt bath by heating it, you will have problems with the cheese quality because:
  - The conditions within the bath will vary.
  - Pasteurizing with heating systems will give problems due to corrosion.

Also heating systems are very costly to operate.

Without filtration:
- The salt diffusion is slower and less predictable.
- The cleaning expenditure is very high.
- Yeasts and bacteria will grow and cause quality problems and subsequent complaints.
- The taste will vary.

Renewing the salt bath is very expensive and will cause loss of production.

We have made salt bath filters within a wide range, for salt baths from 60 to 4.000 m³. It is possible to filter salt bath volumes up to 8.000 m³ with just one Cricket Filter.

A specially designed Cricket Filter

The SBCF is a special Cricket Filter for the conditioning of salting baths in cheese production. The Cricket Filter is a pressure filter with a large specific filtration area due to the shape of the filter elements.

The Cricket Filter is unique because of its patented filter elements, which allow discharge of the filter cake by back pulsing. It was introduced successfully in the dairy industry ten years ago. This filter can be used with hard and semi hard cheeses, as well as selected soft cheeses such as Mozzarella.

The SBCF Cricket Filter is set up in a side stream of the salting bath, preferably before the heat exchanger, removing large quantities of yeasts, bacteria and other undesirable solids. The cleaned salting bath offers both higher microbiological stability for improved product quality and better kinetics for salt adsorption.

During filtration the SBCF Cricket Filter is first precoated with a suitable filter aid. This precoat layer acts as depth filter medium to remove contamination while maintaining a high filtration capacity during a long cycle time. At the end of a filtration cycle the filter is backpulsed and the cake slurry is discharged through a bottom valve.

The filter is equipped with a water sluice for improved cake removal.
**System advantages Cricket Filter**

The Cricket Filter is a closed filtration system and can be fully automated.

The Cricket Filter produces a high filtrate clarity. Elements are mounted on internal filtrate manifolds. Cake release by backpulsing with air is done for each manifold individually, which results in a more effective back pulse. During the short regeneration time the filter medium is cleaned intensively.

The filter connections are typically DIN 11851-SC (dairy standard).

The filter element spacing and the filter cloth are part of our expertise, and selected to suit the filtration needs of the specific application. The filters are standard equipped with a cover lift assembly. The Cricket Filter itself has no moving or rotating parts; this keeps maintenance to a minimum.

Advantages of a standard filtration process
- Cricket Filter to by-pass the salt bath.
- Precoat filtration:
  1. Long cycle times, ca. 10-12 h.
  2. Shorter cycle times in the beginning due to existing high load in salt bath.
- Filter aid selected according to filtration requirements between 0.1 to 10 µm
- Wet cake discharge - backflush into filled tank.
- Optimize the process.

**Minimizing effluent**

To minimize the waste output of the process into the environment:
1. Pump the complete volume through a bag filter to the salt bath.
2. Fill the filter with water.
3. Backflush in the filter with water.

**Improvements**
- Yeast particles decreased by 95 – 99 %
  - In filtrate less than 10-3.000 yeast cells/ml
  - In untreated bath on average up to 50,000-1,000,000 yeast/ml
- Average germ number goes down by 70 – 90 %.
- Reduced moulds by more than 99%
- You are able to change the retention with the type of precoat (for example Perlite or Cellulose)
Summary

The Cricket Filter is a very flexible and advanced filter system for salt bath filtration. It has proven its performance successfully in many European cheese plants.

The plant manager can set the filtrate quality (from 0.1 to 3 μm) by selecting from many different filter aids.

- Maintenance costs are very low.
- Life time of the filter cloth is very long.

With the control panel and (including the CIP program) the Cricket Filter units are fully automatic. The operator can automatically add filter aid to the precoat tank with a Filtration Group dosing device.

Through a CIP (Clean In Place) cleaning system in the cover of the Cricket Filter the complete filter housing can be kept clean and hygienic.

The flow rates of a Filtration Group SBCF Cricket Filter are much higher compared to the systems of others with the same filtrate quality.

Because of the higher flow in the salt bath we can increase salt adsorption by minimizing the boundary layer of the cheese.

The footprint of these units is very small and the running time long, both being a major operational advantage.

The plant can increase its production volume and keep the same high hygienic level. The improved quality of the cheese stays constant.

The filtrate is as clear as water and that is the reason why you don’t need to manually clean the salt bath walls and cheese transport systems. This is beneficial for the ecology and it reduces emission costs.

The salt adsorption is different between the different types of cheese and is related to the residence time of the cheese in the salt bath.

You can expect a payout time anywhere between eight months and three years based on the higher salt absorption alone. On top of that you can expect high and consistent quality, less or no re-calls, less man power requirements and more possibilities to sell cheese with a longer shelf life.