

## MICRO FORMULA™ Application Data - Soft Cheeses, Camembert & Brie Types

### Neutral 60

#### Recommended amount

GEA Filtration recommends the following amounts of admixture of MICRO FORMULA™ Neutral 60 to normal Soft Cheese types:

10+ cheese: 7-8% of cheese milk volume  
 20+ cheese: 6-7% of cheese milk volume  
 35+ cheese: 5-6% of cheese milk volume  
 45+ cheese: 3-5% of cheese milk volume  
 50-70+ cheese: 3-4% of cheese milk volume.

No information about the maximum allowable amount of MICRO FORMULA™ Neutral 60 for each specific cheese type is available yet.

#### Required adjustments

As the amount of water bound to the cheese increases with the amount of MICRO FORMULA™

Neutral 60 added to the cheese, the cheese recipe needs to be modified accordingly.

Besides, GEA Filtration recommends the following cheese-making process to optimize the quality of the final cheese:

1) Add MICRO FORMULA™ Neutral 60 to the cheese milk.

2) Pasteurize the cheese milk with added MICRO FORMULA™ Neutral 60 at 72 °C for 15 sec.

3) Furthermore, the following adjustments must be made during the cheese-making process:

3a) Increase the final temperature of the cheese milk after addition of hot water by 1-2 °C

3b) Prolong the final stirring time before whey drainage by 2-5 minutes

The combination of 3a) and 3b) must be optimized for each individual cheese process.

If the temperature of the final cheese milk is above 40 °C, it may be necessary to switch over to a thermophilic starter culture.

#### Industrial experience

Subsequent to the above described minor adjustments of the conventional cheese-making process, our customers have obtained very positive results with MICRO FORMULA™ Neutral 60 (no bitter off-taste in the final cheese).

Hence, a special sensory panel has not been able to distinguish between Soft Cheeses with and without admixture of MICRO FORMULA™ Neutral 60.

### MICRO FORMULA™





## Process Description

### MICRO FORMULA™ Unit

GEA Filtration has developed a new simple unit for microparticulation of whey proteins. The unit, named MICRO FORMULA™, now makes it possible to utilize the bi-product, whey, to increase product yield and replace fat. The microparticulation process forms particles similar to milk fat particles. Microparticulated whey can be used in a number of dairy products.

The products, where fat can be replaced, include:

- Most cheese types (also yield increase)
- Ice cream
- Yoghurt and milk desserts
- Dressing and sauces
- Mayonnaise and fat emulsions
- Other fat-containing food products

### Advantages in operation and investment costs

Compared to existing microparticulation technologies in the market, MICRO FORMULA™ presents a number of advantages for our customers. The process is simple - and the unit is easy and inexpensive to maintain and it comes in standardized modules. In addition to this the MICRO FORMULA™ has the following advances:

- No scraped surface heat exchangers (SSHE)
- No homogenizer
- No tubular heat exchangers (THE)
- No heat transfer surfaces > denaturation temperature
- Ordinary plate heat exchangers (PHE)
- Ordinary flow components
- Low maintenance costs
- No scraps from scraper blades or stator in the final product
- Yield increase – protein and water binding effect
- Long production time between CIP – 18-20 hours
- Payback calculation < 1 year
- A true “Money Printing MICRO FORMULA™ Unit”

### Side benefits

Furthermore, microparticulated whey proteins, utilizing cheese whey otherwise dumped as a damaging waste product and replacing fat in a lot of dairy products, have a direct positive impact on the environment and public health.

### Product characteristics

The microparticulated particles have the following characteristics:

- Viscosity as cream
- Creamy
- Whitish
- Particle size 1-10 µm

### Technological features

The process is generally profitable for customers generating more than 80,000 litres of whey per day.

GEA Filtration offers the MICRO FORMULA™ unit in the following five sizes:

| MICRO FORMULA™ unit | MP500       | MP1000        | MP1500        | MP2000        | MP3000        |
|---------------------|-------------|---------------|---------------|---------------|---------------|
| Capacity [kg/h]     | 500         | 1.000         | 1.500         | 2.000         | 3.000         |
| Whey utilized [l/h] | 8,500-9,000 | 17,500-18,000 | 25,500-27,000 | 35,000-36,000 | 51,000-54,000 |
| UF system           | 2 loops     | 2 loops       | 3 loops       | 4 loops       | 5 loops       |

GEA Filtration has supplied reference units running 18 hours a day with only one CIP (cleaning-in-place) each day.