



ALPMA CreamoProt® is a whey protein product produced on ALPMA plants using a special technology. It contains approx. 8 – 10% total protein present in form of denatured, spherical protein structures. It shows excellent characteristics, for example:

- creamy mouth feeling
- white color
- pleasant viscosity.

CreamoProt® can be integrated into a wide range of dairy products and offers the customer a lot of advantages:

- replacement of casein by whey protein for use in cheese
- replacement of fat for use in cheese
- increase of water binding capacity for different products, hence production of products with a higher water content with comparable sensory characteristics.
- improvement of texture and mouth feeling of fat reduced products
- replacement of complete product fractions, for example for use in curd cheese, cream cheese, cottage cheese, fruit and chocolate milk drinks and others.

ALPMA was the first plant manufacturer to build installations for continuous particulation of whey protein concentrates, manufacturing process that started already in the year 2000. In the meantime more than 20 plants are successfully working in very different applications. Since 2001 tests on an ALPMA CreamoProt® plant have been carried out for approx. 50 customers worldwide. As a consequence ALPMA disposes of a wide spectrum of experiences not only for the production of CreamoProt® but also for its optimum use in different dairy products.

Scope of delivery of an ALPMA CreamoProt® plant: an ultrafiltration plant for pre-concentration of whey and the proper CreamoProt® plant, consisting of a combined heating and a mechanical treatment line. Should the customer already dispose of an appropriate UF plant, an ultrafiltration plant is not necessary.

The UF plant adjusts the protein content in the whey concentrate to 8-10%. Then the UF concentrate is regeneratively heated and afterwards pre-heated in a 3-stages plate heat exchanger of the subsequent CreamoProt® plant. The final heating takes place under defined shear force action in a scrape heat exchanger designed specifically for this process. A time-adjustable heat holding section follows. Then the product is pre-cooled again in a specially designed scrape heat exchanger under defined shear force action. In the regenerative part of the plate heat exchanger the cooling of the product continues, followed by a subsequent final cooling by iced water in the cooling part of the plate heat exchanger. Afterwards a transfer to the customer's interface takes place.

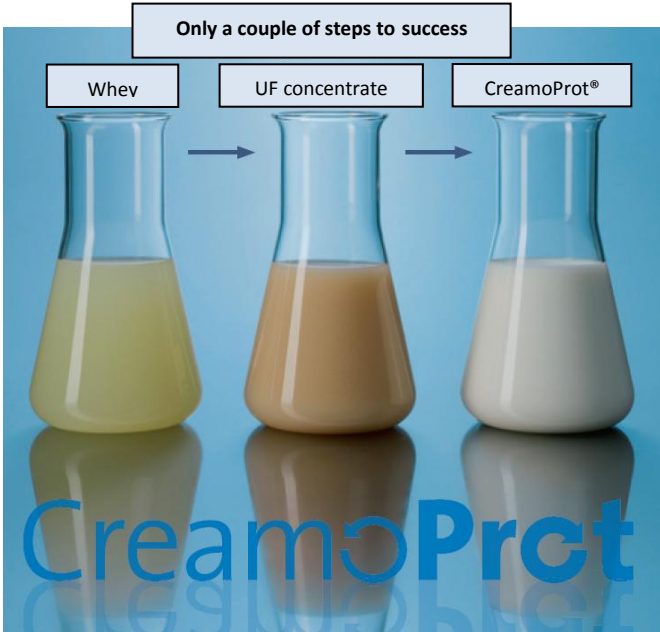
During commissioning the combination of adjusted temperature, heat holding time and shear action values is specifically adjusted to the concrete product in order to reach the desired product characteristics.

Our delivery program comprises installations of

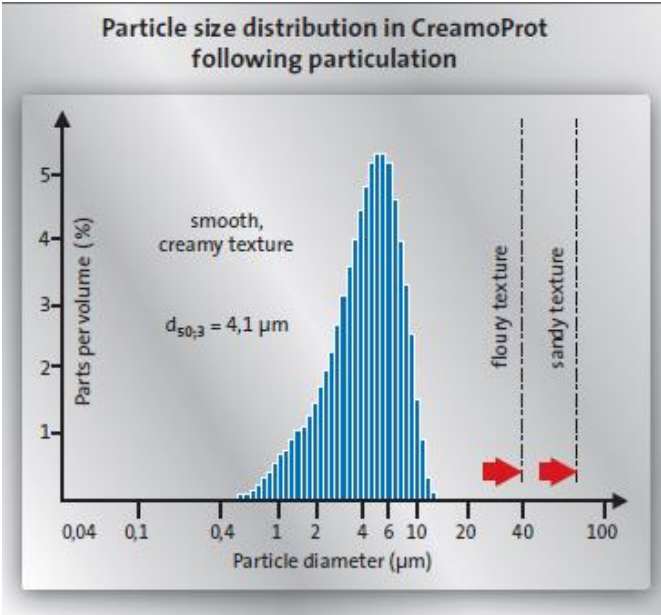
200 l/h * 500 l/h * 1.000 l/h * 1.800 l/h and 2.600 l/h.

Tanks and valve manifolds in front of and after the CreamoProt® plant have to be supplied by the customer or can be quoted on request as an option. They will be integrated into the plant's control system by signal exchange. The plant is cleaned by a normal CIP supplied by the customer. Internally adjusted overflow rates ensure an optimum cleaning.

The following picture shows the transformation from whey into CreamoProt®.



In the product a medial particle size between 3 and 10 µm is adjusted.



Exemplary particle size distribution

The following schematic diagram shows the integration of particulated whey protein globules into a casein matrix.

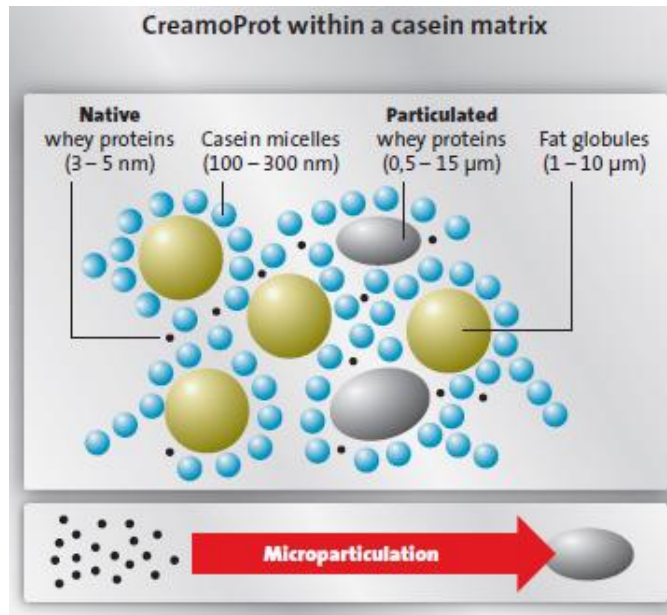


Photo of a CreamoProt® plant with a capacity of 1.800 l/h.



ALPMA

CreamoProt®

Reference plants

Planning, construction and put into operation including control and electrical engineering

- CreamoProt® plant with a capacity of 1,500 l/h for hard cheese whey (Austria - 2000)
- CreamoProt® plant with a capacity of 1,500 l/h for cottage-cheese-whey (Austria - 2005)
- CreamoProt® plant with a capacity of 1,000 l/h for sweet whey (Poland - 2006)
- CreamoProt® plant with a capacity of 500 l/h for sweet whey (Germany - 2006)
- CreamoProt® plant with a capacity of 500 l/h for sweet whey (Italy - 2006)
- CreamoProt® plant with a capacity of 1,000 l/h for sheep whey (Greece - 2006)
- CreamoProt® plant with a capacity of 1,000 l/h for sheep whey (Greece - 2007)
- CreamoProt® plant with a capacity of 1,000 l/h for acid whey (Spain - 2007)
- CreamoProt® plant with a capacity of 250 l/h for acid whey (USA - 2007)
- CreamoProt® plant with a capacity of 1,800 l/h for white cheese whey (Turkey - 2008)
- CreamoProt® plant with a capacity of 1,500 l/h for ideal whey (France - 2008)
- CreamoProt® plant with a capacity of 1,000 l/h /1,800 l/h for acid whey (USA – 2009/2010)
- CreamoProt® plant with a capacity of 1,000 l/h for acid whey (Germany - 2009)
- CreamoProt® plant with a capacity of 1,800 l/h for sweet whey (Greece - 2009)
- CreamoProt® plant with a capacity of 250 l/h in 3A (USA - 2010)
- CreamoProt® plant with a capacity of 500 l/h for sweet and acid whey (Latvia - 2010)
- CreamoProt® plant with a capacity of 1,800 l/h for sweet whey (Greece - 2010)
- CreamoProt® plant with a capacity of 1,000 l/h in 3A for feta whey (USA - 2011)
- CreamoProt® plant with a capacity of 1,800 l/h in 3A for sweet whey (USA 2011)
- CreamoProt® plant with a capacity of 250 l/h for acid whey (Germany 2011)
- CreamoProt® plant with a capacity of 1,800 l/h for Feta whey (Netherlands 2011)