



SEPARATION

# DRUM DRIED MILK POWDER

AN INDISPENSABLE  
CHOCOLATE INGREDIENT

**ANDRITZ**

ENGINEERED SUCCESS

# A large content of free fat



ANDRITZ Gouda double drum dryer

## FOR CHOCOLATE WITH A UNIQUE CARAMEL TASTE

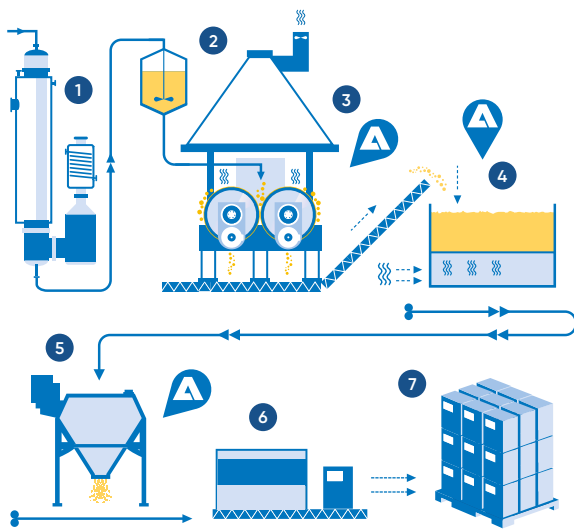
Milk powder is one of the main ingredients for the production of chocolate. It not only determines the taste of the chocolate, but also influences the production process and has a large economic impact. The chocolate industry has been using mainly drum-dried milk for more than a hundred years. Drum-dried milk powder contains a large amount of free fat, which makes it possible to reduce the expensive cacao butter content in chocolate. The special taste of drum-dried milk powder is very important in chocolate making and gives chocolate a unique caramel taste. Moreover, this type of milk powder has a positive effect on the fluid of the chocolate mass. These characteristics are of vital importance in the production process. All these advantages make drum-dried milk powder an indispensable component of milk chocolate.

## PROCESS DESCRIPTION

The milk powder is produced in several stages: raw milk handling, liquid treatment, milk concentration, drying, and milk powder handling. The most important stage before drying is milk concentration. Vacuum evaporators are often used in this stage, because of their low overall energy consumption. In general, drying processes are characterized by high energy requirement, and removing water by drying is more costly than by vacuum evaporation. This is why, as much water as possible is removed during the concentration stage. The latest evaporator technology makes it possible to remove more than 55% of the water. After the concentration stage, the concentrated milk with a dry solids content of 40–45% is fed to the drum dryer. The milk is further concentrated in the sump between two drums and then adheres to the rotating drums. After almost one rotation, the dried product film – as a sheet of paper – is scraped off by the knife. The dried film is transported to a cooler and from there it is brought to silos and/or a packaging machine.

# The drum drying process

The drum body of the drum dryer is heated on the inside by steam. A special composition of cast iron gives the drum a combination of favorable properties: very accurate shape retention even at high steam pressure and temperature, and excellent “scraping properties” for the scraping knife. Steam heating provides a uniform temperature distribution over the drum surface, and this results in a consistent product quality. The steam condenses on the inside of the drying drum.



Drum drying process for milk powder

- 1 Multi-stage evaporator
- 2 Holding tank
- 3 Drum dryer
- 4 Fluid bed cooler
- 5 Mill sifter
- 6 Packaging machine
- 7 Storage

The condensate is removed continuously from the drum, so the largest possible surface area remains available on the inside of the drum for condensation of the steam. The steam system is a closed loop, which means that the product cannot come into contact with the steam or condensate. Depending on the design of the drum dryer, the product is applied continuously as a thin film at the bottom or top of the main drum. As the drum rotates and is heated on the inside, the product dries on the outside of the drum surface. The brief exposure to a high temperature reduces the risk of damage to the product. The water or solvent evaporates and leaves the process at the top. If necessary, the vapor can also be removed by suction locally around the drum.



Dried film

The dried product film finally reaches the knife and is scraped off. In a double drum dryer, the product is fed into the sump between the two main drums (which always rotate in opposite directions). The small gap between the drums can be set accurately to obtain a desired film layer.

## BENEFITS

- Results in high quality chocolate
- High free fat content
- Unique caramel taste
- Reduces the amount of cacao butter
- Lower energy consumption than spray drying



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