



Tetra Pak® Spray Dryer Prolac

Continuous spray drying system for milk & whey permeate powders.



Application

Tetra Pak® Prolac drying solution is used for producing permeate powder from various types of cheese whey. The Prolac system is also suitable for processing milk permeates.

Combining Tetra Pak® Tall Form Bustle (TFB) dryer with a timing belt, shaking fluid bed and Open Transport System (OPT) allows for the production of high quality non caking permeate powder, as well as the production of sweet whey powders.

Highlights

- Delivering class leading premium quality non-caking and non-hygroscopic powder
- Typically integrated in a full Tetra Pak line solution including evaporation, crystallization and powder handling
- Flexibility in product configuration and powder functionalities
- Proven technology

- Long production runs
- Compliance to latest explosion safety regulations and hygiene standards

Working principle

The TFB spray dryer is characterised by its tall slim drying chamber and air outlets positioned on the bustle. Featuring a single STAD air distributor with integrated high-pressure nozzle assembly and optional fines return capability, the set-up enables easy and accurate process adjustments as well as improved operator safety through short lances and side-mounted placement.

Concentrate is dried in the chamber through high pressure atomisation. The produced powder settles in the drying chamber at a relatively high moisture content to facilitates crystallisation of the lactose. When crystallisation has reached a certain degree, the pre-crystallised powder is discharged from the chamber.

Powder from the chamber falls onto the timing belt, where a defined residence time allows for the post crystallisation of lactose into a stable form. The powder is further treated in the shaking bed(s), where conditioned drying and cooling air is used to fluidize, transport, dry, and cool the product to the desired moisture content and temperature.

Dryer exhaust air conditioning is applied to ensure low relative humidity in the dryer exhausts and main cyclones, ensuring optimal transport of the fines and minimizing the risk of fouling in these areas. Fines that are contained in the exhaust air are separated and collected in the Open Transport System at the bottom of the main cyclones. Conditioned air is used to convey and cool the fines before they are separated in the OPT cyclone which will reduce stickiness and hence formation of deposits. The fines are then conveyed by means of a MPT system to the atomizing zone for agglomeration, or to the fluid bed for manufacturing of non-agglomerated products.

Capacity

Capacity of the spray drying system depends on product range and available permeate flow. For example a system to produce 3 000 kg/hr permeate powder could be as follows:

SCOPE OF SUPPLY

- Feed system: feed tank(s) and feed pump
- Tetra Pak® Homogenizer high-pressure pump and high-pressure set
- Tetra Pak® Spray Dryer Prolac, crystallization belt and Tetra Pak® Shaking Bed
- Air supply system, including filter, main air heater, fans and ducting
- Air exhaust system, including ducting, Tetra Pak bag filter and fan
- Instrumentation and automation
- Engineering and commissioning
- Documentation, warranty and service

Options

- Energy recovery
- 24/7 production
- De-humidification
- Spray monitoring system
- Tetra Pak cyclone(s), including high efficiency alternatives, plus cooling transport system (for difficult drying permeates)
- Tetra Pak bag filter (fully cleanable CIP execution)

Consumption

Based on a capacity of 4,500 kg/hr concentrate from 64 to 98 TS %, during normal production and environmental conditions of 10 °C and 95 % RH:



TETRA PAK® SPRAY DRYER PROLAC

Steam*, kg/hr	3,500
Electricity, kW (absorbed)	320
Cooling water**, m ³ /hr	4
Compressed air, Nm ³ /hr	130

* 9 bar (at 10 °C and excluding winter coil)

** with 2 °C in and 6 °C out