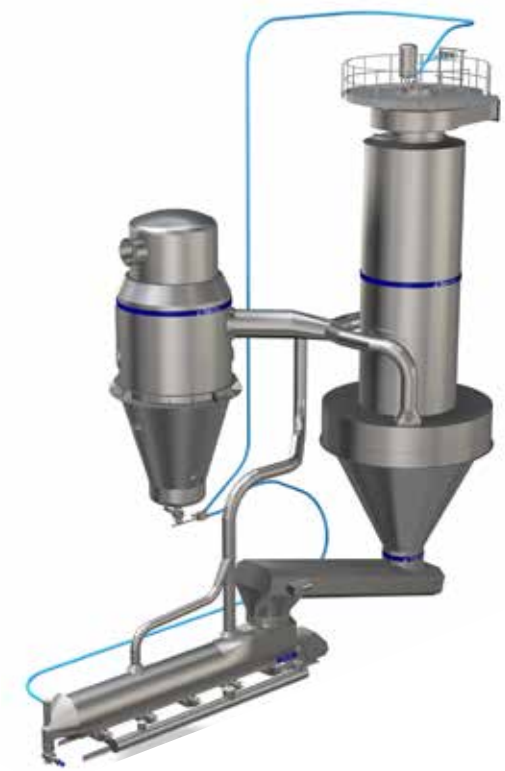
Tetra Pak® Spray Dryer Prolac

Continuous permeate spray drying system



Highlights

- Flexibility in product range and powder functionalities
- Proven technology
- Long production runs
- Fully cleanable (Cleaning In Place)
- Complying with latest emission demands – no need for scrubbers!
- Delivering best available powder quality (free flowing and dust free)

Application

Tetra Pak® Spray Dryer Prolac provides a fully automatic and continuous spray drying system. Tetra Pak Spray Dryer Prolac is suitable for the production of free flowing, dust free permeate powder; also very suitable to run whey powder.

Working principle

From the feed tank product is pumped with a high pressure (HP) pump to the HP nozzles. Drying air is prefiltered and heated by means of heater, using steam, natural gas, electricity or oil as energy source.

In the Sunflower air distributor drying air is guided in a controlled and well defined way via a venturie into the centre of the drying chamber. Product is sprayed in the airflow as fine droplets. If agglomeration is required, fines are fed into the flow as well.

In order to guarantee the optimal position of the nozzles, each lance is positioned on a swivel, where with we can adjust the nozzle orientation. If a non-agglomerated product is run, the fines returns to the fluid bed instead of the top of the dryer, and lances can be positioned in amore outward position.

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Working principle

The airflow inside the drying chamber follows a co-current reverse flow, which means air travels down with the product and in the cone product travels towards the cone outlet, whereas air leaves the drying at the top of the bustle.

Different than other products, permeate leaves the dryer at a relatively high moisture content and Tetra Pak® Spray Dryer Prolac is used.

Product falls on the crystallisation belt, whereby lactose crystals move into a stable configuration. Final step is drying in the Tetra Pak® Shaking Bed, whereby drying air is used to fluidise and dry product to the final moisture content. The sheet has a zig-zag pattern to ensure a well defined heat treatment and residence time.

Powder falls into a cone mill, to loosen the powder and then into a sifter to remove lumps, if any, ready to transport to silos and packing.

Exhaust air from dryer and shaking bed is fed to a CIP-able bag filter to separate fines from the air.

A temperature controller in the exhaust air is used to set the speed of the high pressure pump.

Capacity

Capacity of the spray drying systemdepends 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 and feed pump
- Tetra Pak® Homogenizer pump and high pressure set
- Tetra Pak Spray Dryer Prolac, crystallisation belt and Tetra Pak Shaking Bed
- Air supply system, including filter, main air heater, fans and ducting
- Air exhaust system, including ducting, fan and CIP-able bag filter
- Instrumentation and automation
- Documentation and engineering

Options

- Heat recovery

Consumptions

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:

Steam	9 bar 3 500 kg/hr (at 10 °C and excluding winter coil)
Electricity	320 kW (absorbed)
Ice water	4m³/hr with 2 °C in and 6 °C out
Compressed air	130Nm³/hr

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