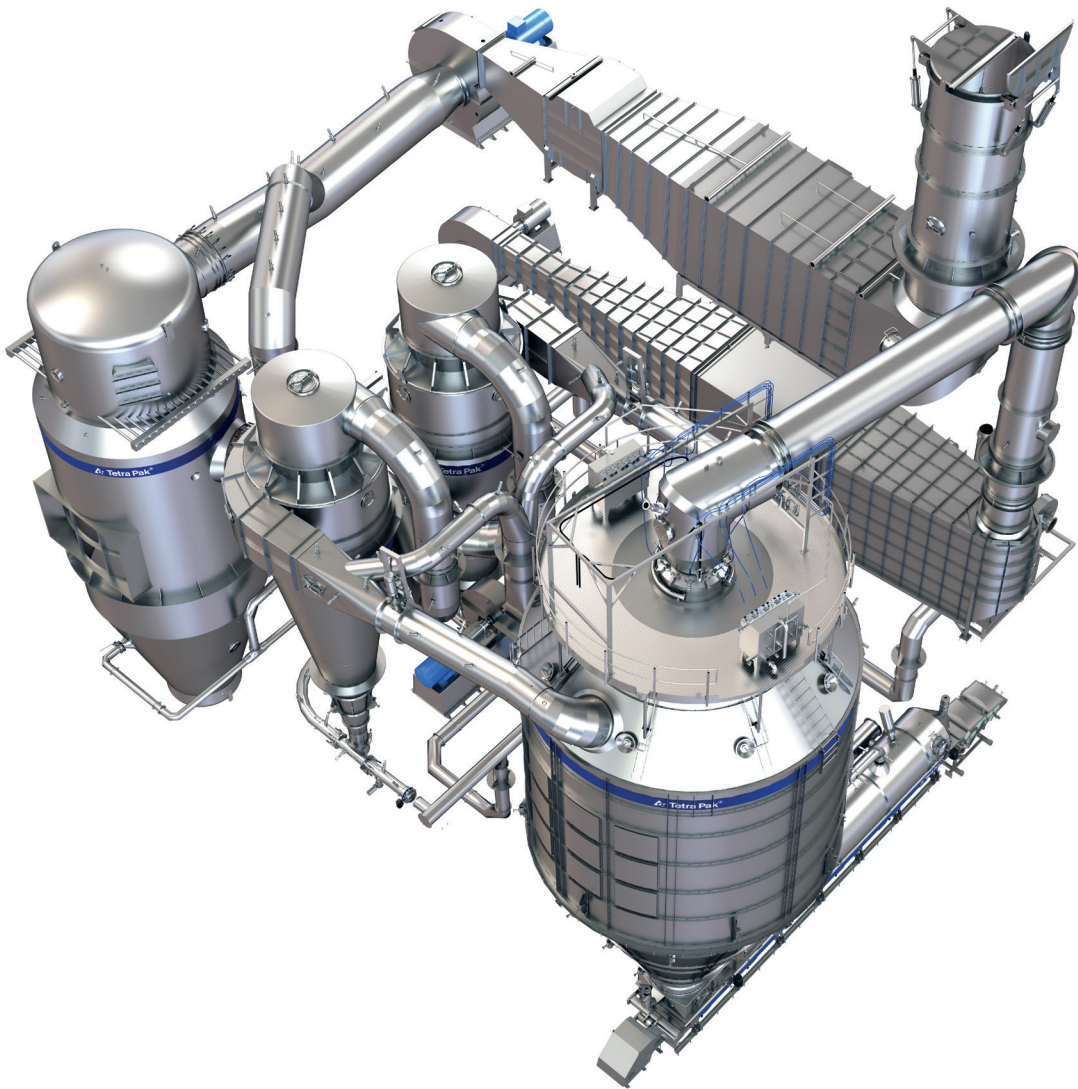




# Tetra Pak® Spray Dryer Tall Wide Body

Continuous spray drying system for nutritional powders.



## Application

Tetra Pak® Tall Wide Body (TWB) spray dryer is predominantly used for Nutritional Powder production, such as a full range of infant formulations and other thermoplastic behaving products. Increased flexibility in powder production and properties is achieved by combining the TWB with an internal static bed and/or Open Transport System (OPT).

## Highlights

- Delivering high quality nutritional powders
- Flexibility in product recipes/compositions and powder functionalities
- Typically integrated in a full Tetra Pak line solution including wet section, evaporation (optional) and powder handling
- Intelligent customization providing flexibility on final design concept such as integrated or external well mix bed, middle and/or

open pressure transport systems

- Proven technology
- Critical high hygiene standards
- Validated CIP (pop out nozzles with feedback)
- Compliance to latest explosion safety regulations

## Working principle

The TWB spray dryer is characterised by its larger cylindrical height compared to the dryer diameter itself for extended drying time (longer jet residence time) and has the outlets at the top of the chamber. The TWB concept relies on a co-current, reversed airflow pattern in the drying chamber, creating a barrier of fines containing relatively cold process air between the hot air jet in the centre and the dryer wall, thus minimizes formation of powder deposits on the chamber wall.

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. Depending on the required functional properties, fines separated from the exhaust air can be reintroduced in the atomizing zone. The air in the cylindrical section travels almost plug flow and reverses in the conical section. The process air discharges at the top of the cylinder with any smaller particles (fines) that are entrained in this exhaust air.

In the TWB spray dryer the co-current reversed air flow pattern induces a recirculation flow in the chamber which extends the residence time of product particles and hence improves the handling of thermoplastic products.

Due to the reversing of the airflow, the coarse particles are separated from the air by gravity and discharged into a static or shaking bed for multi-stage drying. The multi-stage drying concept allows drying of products at a relatively high moisture levels for improved energy efficiency.

Depending on customer preferences, desired powder properties and importantly the end use application; the fines will be handled by either a cyclone(s) and/or bag filter arrangement.

#### CONDITIONING OF FINES THROUGH AN OPEN TRANSPORT SYSTEM (OPT)

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 heat exposure of fines and hence potential damage of product. 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 concentrate intake. For example, a system to produce 3 000 kg/hr infant formula powder could be as follows:

#### SCOPE OF SUPPLY

- Feed system: feed tank(s), feed pump and concentrate heater
- Tetra Pak® Homogenizer high-pressure pump and high-pressure set
- Tetra Pak® Spray Dryer Tall Wide Body, static well mixed bed and Tetra Pak® Shaking Bed
- Air supply system, including dehumidification unit for main dryer air, filters, main air heater, fans and ducting



- Air exhaust system, including ducting, cyclone(s), Tetra Pak bag filter and fan
- Instrumentation and automation
- Engineering and commissioning
- Documentation, warranty and service

#### Options

- Integrated Static Bed
- Energy recovery
- 24/7 production
- Spray monitoring system
- Tetra Pak cyclone(s), high efficiency alternatives
- Tetra Pak bag filter (fully cleanable CIP execution)
- Open transport system (OPT)

#### Consumption

Based on a capacity of 5,850 kg/hr concentrate from 50 to 97.5 TS % and during normal production:

#### TETRA PAK® SPRAY DRYER TALL WIDE BODY

Steam*, kg/hr	8,000
Electricity, kW (absorbed)	580
Cooling water**, m <sup>3</sup> /hr*	20
Compressed air, Nm <sup>3</sup> /hr	6

\* 10 bar (at 10 °C, excluding dehumidification unit and winter coil)

\*\* with 2 °C in and 8 °C out