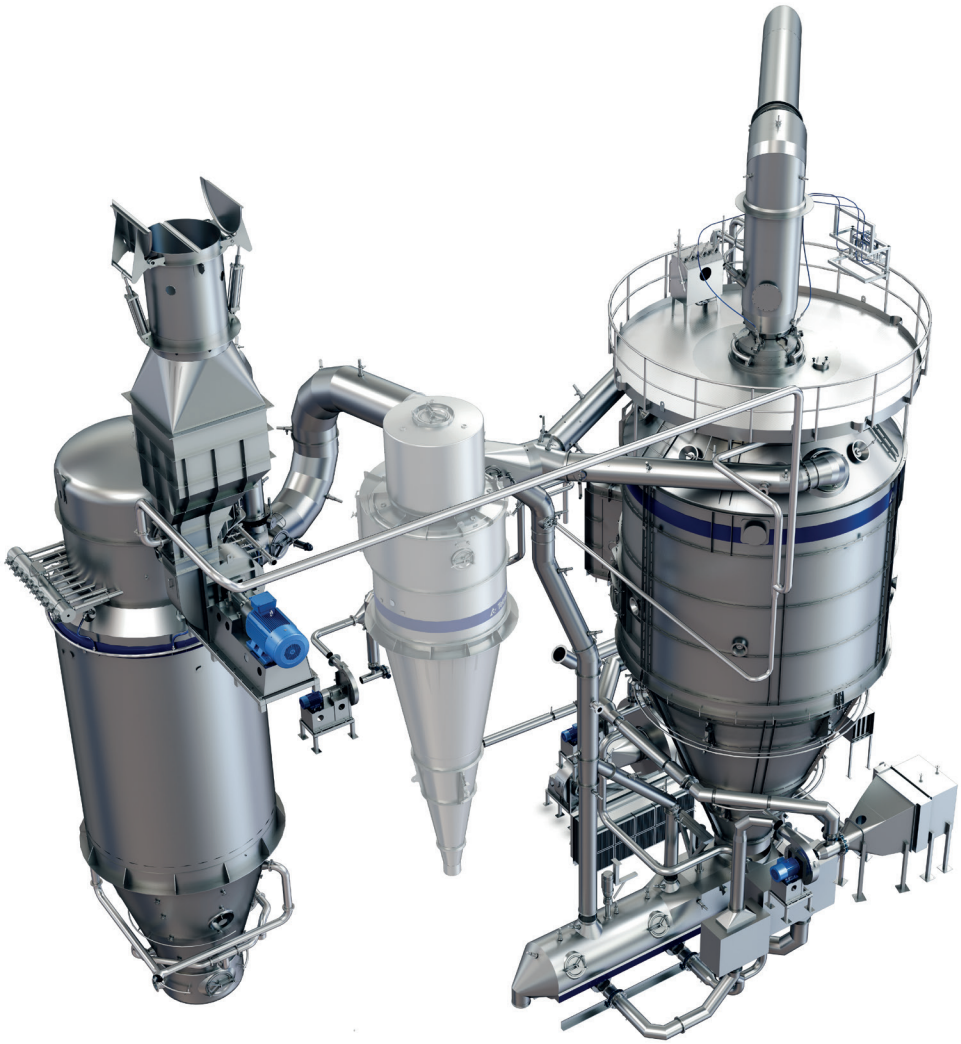
Tetra Pak® Spray Dryer Wide Body

Continuous spray drying system for dairy, whey & plant-based powders.



Application
Tetra Pak® Wide Body (WB) spray dryer is known for its high level of flexibility and is our most standardised and building efficient design. The WB spray dryer is capable of producing a wide variety of powders such as milk, whey, whey derivatives, plant-based products and baby food. The WB dryer is typically operated as a multi-stage dryer for the production of agglomerated and instantized (lecithinated) products.

Highlights
- Delivering best available powder quality
- 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
- Highly standardized range from small to large capacities, cost and energy efficient
- Most building efficient design
- 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
- Long production runs
- Compliance to latest explosion safety regulations and hygiene standards

Working principle
The WB spray dryer is characterised by its large diameter compared to the dryer height itself and has the outlets at the top of the chamber. The Wide Body 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 minimizing 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.

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 fluidbed for multi-stage drying. The multi stage drying concept allows drying of products at a relatively high moisture levels for improved energy efficiency.

Alternatively, the WB dryer can be operated as a single stage dryer with an open pressure transport (OPT) system for product cooling and transport to either cyclones or a bag filter, eliminating the need for a fluidising bed. This concept does not allow production of agglomerated or instantized (lecithinated) products.

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.

Capacity
Capacity of the spray drying system depends on product range and concentrate intake. For example, a system to produce 7 000 kg/hr whole milk 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 Wide Body 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
- Integrated static bed
- Energy recovery
- 24/7 production
- De-humidification
- Spray monitoring system
- Tetra Pak cyclone(s), including high efficiency alternatives
- Tetra Pak bag filter (fully cleanable CIP execution)

Consumption
Based on a capacity of 13,580 kg/hr whole milk from 50 to 97 % and during normal production (using steam main air heater and Tetra Pak bag filter):

TETRA PAK® SPRAY DRYER WIDE BODY

Steam, kg/hr	11,000
Electricity, kW (absorbed)	570
Cooling water, m^3/hr*	11
Compressed air, Nm^3/hr	170

* with 2 °C in and 8 °C out