



## Gentle Drying - High Efficiency

The LARSSON Whirl Flash™ dryer is specially designed for continuous drying of filter cakes, slurries, pasteous and fibrous products. Unlike other comparable dryer types on the market the LARSSON Whirl Flash™ dryer is ideal for inorganic chemicals and even more difficult products, such as plant-based and meat proteins, which can be successfully dried in the LARSSON Whirl Flash™ dryer. Backmixing is rarely needed.

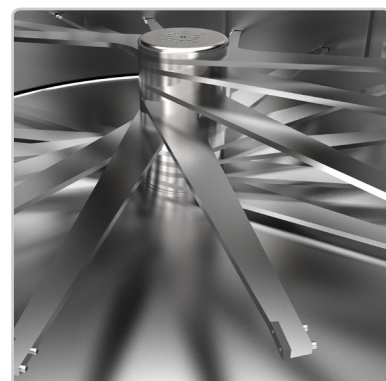
Experience has shown significant energy savings when using the LARSSON Whirl Flash™ dryer. The instant drying of the product considerably reduces the products heat degradation.

This effect allows to use significantly higher process temperature resulting in smaller dryer geometry (less investment) and reduced energy consumption.

The feed buffer is placed on load cells to enable an accurate feeding of the product in accordance with the dryer's current capacity.

The entire drying process is fully automated.

The Whirl Flash™ dryer can handle feed with a higher moisture content in comparison to commonly used flash dryers.



## Functional Description

The product enters a buffer tank provided with a slow-rotating agitator which feeds the product into a twin screw conveyor system. This system ensures smooth feeding to the drying process, which is accurately controlled by a combination of a buffer tank equipped with load cells and the variable speed of the twin screw.

One of the key success factors is the perfect dispersion of the wet material by fast moving rotor blades into the hot air. In this way the product surface area is very much increased and water can be flashed off instantly. Due to the superb degree of dispersion a higher drying air temperature is achieved in comparison to other types of flash dryers. Energy cost savings are achieved due to the high differential temperature (inlet/outlet) in combination with the reduced airflow. Another remarkable feature of the rotor blades in combination with controlled residence time in a balanced fluidized bed is the possibility to create a semi-milling effect.

Size uniformity of the fibres can be controlled without the use of milling equipment.



The semi-dry powder moves from the disintegration zone to the fluidization zone, where the desired

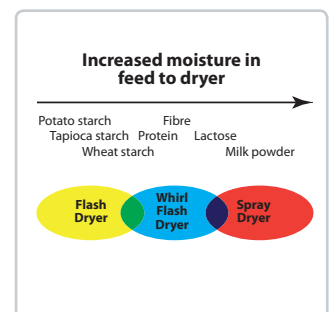
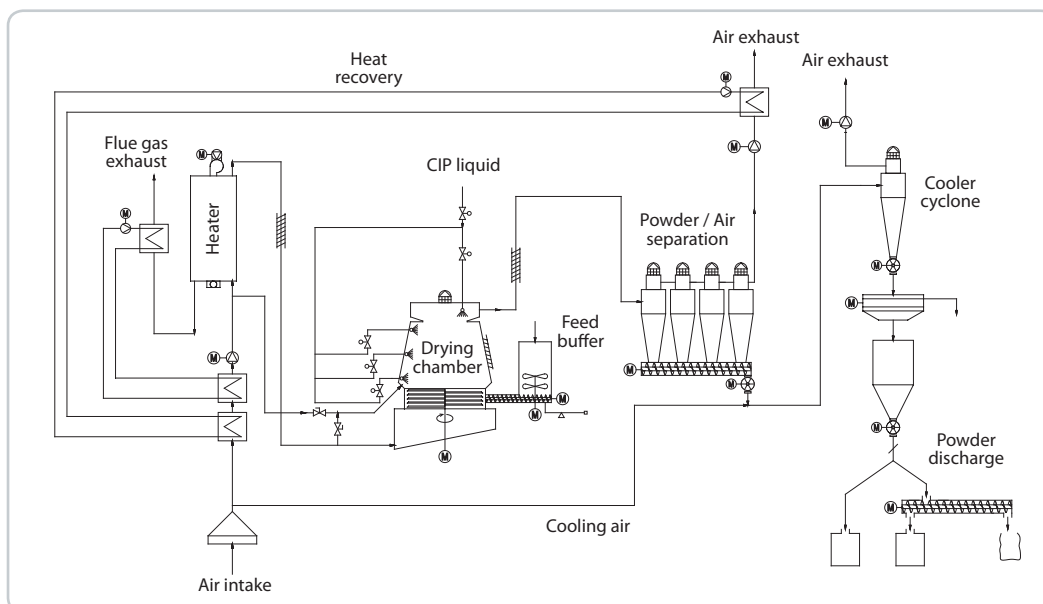
moisture level is achieved at a lower temperature (2-stage drying). In the fluidization zone, secondary air is fed which surrounds the particles with dry air of moderate temperature, ensuring a gentle drying of the particles.

In the bottom section of the drying chamber a stationary air distributor is placed which distributes the dry air evenly up into the rotor zone. Thus, an intense contact between wet product and dry air is created.

Powder and air are taken out through a classifier

which exercises certain particle-size control, and then fed into a powder separation system based either on cyclone or filter. Often a powder cooling step is introduced at this point in order to flash cool the powder prior to bagging.

The LARSSON Whirl Flash™ dryer can be customized based upon requirements and preferences about heating technologies and emission standards. Further, the dryer's components can be designed to fit in existing facilities

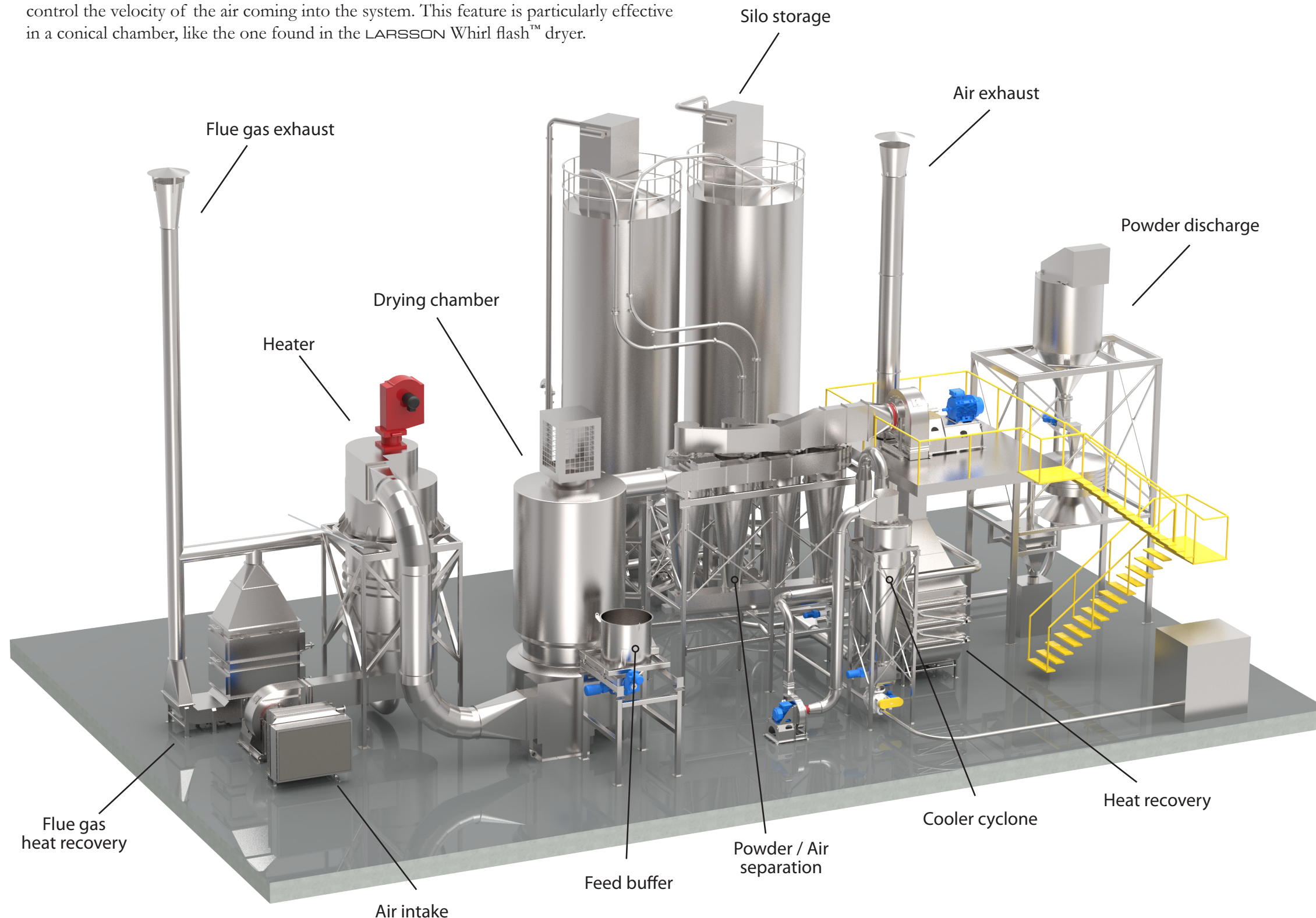




## Gentle 2-stage Drying

The LARSSON Whirl flash™ drying chamber is divided into two zones. In zone 1, disintegration and drying take place, and in zone 2 (fluidization zone) a gentle post-drying occurs, as in a fluid bed.

The fact that there are two stages for the drying process means that the drying takes place at lower temperature than in a single-stage dryer and therefore, is more gentle to the product. Particle size can be adjusted during operation by letting the effect of the disintegrator control the velocity of the air coming into the system. This feature is particularly effective in a conical chamber, like the one found in the LARSSON Whirl flash™ dryer.



## Advantages

- Excellent drying at low energy costs
- Minimal heat effect on product, gentle drying
- Continuous and flexible drying process
- Reduced airflows mean smaller filters/cyclones
- Extremely short drying time
- Reduced building investment costs
- Reduced erection costs
- Reduced space requirement
- Reduced running costs
- Backmixing not necessary in many cases

## Other benefits

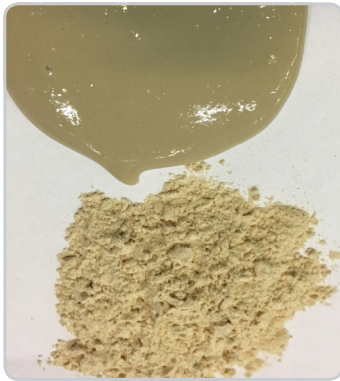
- Replaceable knife edges.
- Adjustable and replaceable milling ribs in milling chamber.
- Robust shaft design with bearings dimensioned for long lifetime.
- Belt drive design with low space claim height and easy accessibility for maintenance.
- Explosion proof design, with flameless indoor venting.
- CIP-system with 9 PIPO nozzles in drying chamber and also spray head in the feed buffer tank.
- Controlled air flow in drying chamber.
- 2 different airflows (2-stage drying) entering the drying chamber at different temperatures to achieve maximum drying without damaging the product.
- Vortex chamber with diffusor



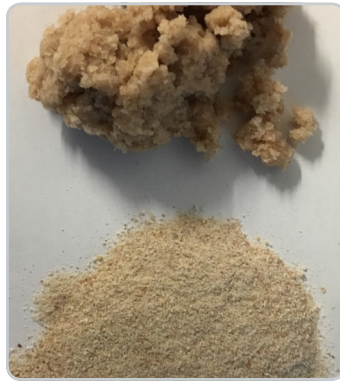


## Application Example

Potato protein



Potato fibre



Mashed potato



Carrot fibre



Defatted cod



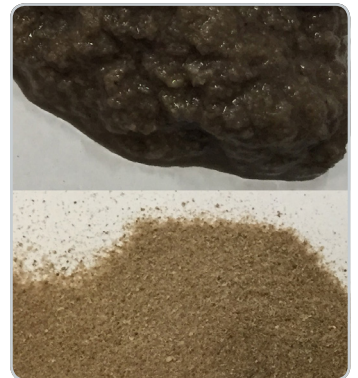
Defatted mackrel



Defatted salmon



Hydrolyzed shrimp



Poultry meat bone meal



Poultry meat paste



Hydrolyzed bristle



Coagulated blood



Defatted greaves



Hoofs & hair



Hydrolyzed feathers



Pig manure



# LARSSON Whirl Flash™ Dryer

## GLWF

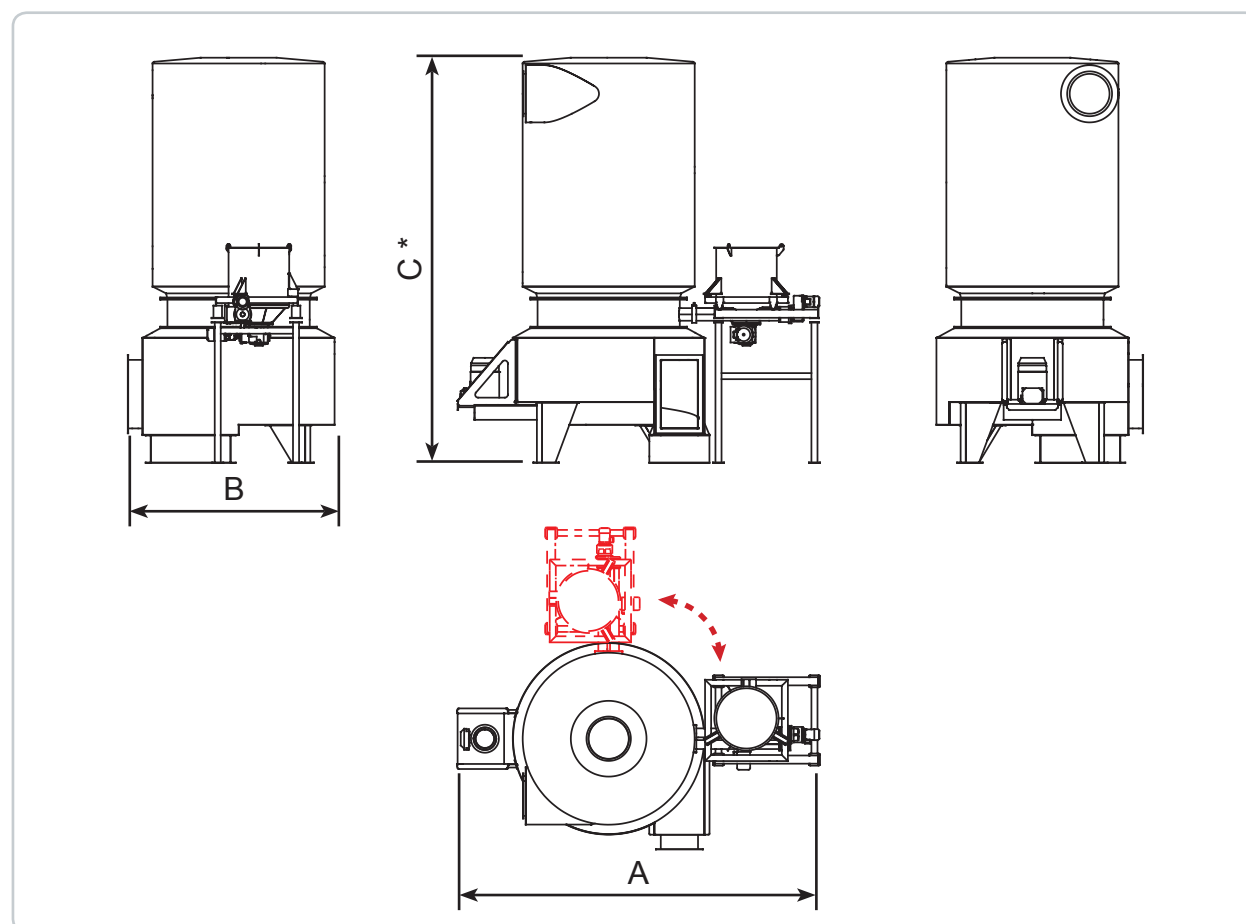
### Technical Information

GLWF	Drying chamber			
	Rotor power [kW]*	A [mm]	B [mm]	C [mm]*
10	15-37	4700	1600	3350
12	15-37	4900	1900	3900
14	22-55	5200	2150	4400
16	37-75	5400	2450	4950
18	37-75	6100	2750	5450
20	55-90	6300	3050	6000
22	55-90	6500	3300	6500
24	55-90	6700	3600	7000
26	75-110	7000	3900	7550
28	90-160	7200	4150	8050

\*) Without EX-device

For further technical information, please contact LARSSON

General dimensions of the drying chamber



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