

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.

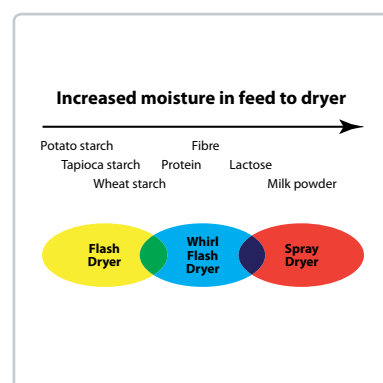
Experience has shown significant energy savings when using the LARSSON Whirl Flash™ dryer. The instant drying of the product considerably reduces the products heat degradation.

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.

As shown in the right hand picture the Whirl Flash™ dryer can handle feed with higher moisture content in comparison with common 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.

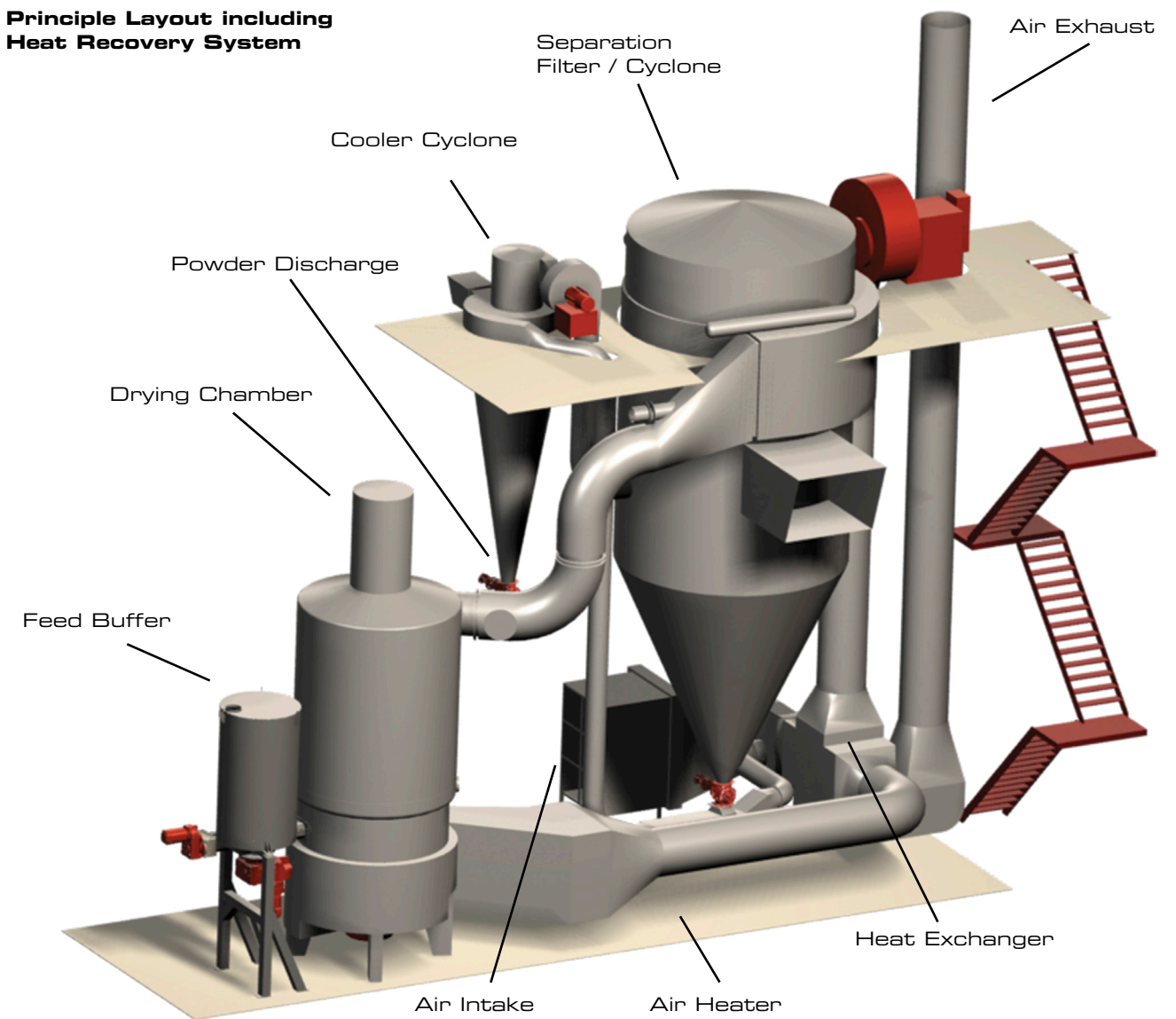
Another remarkable feature of the rotor blades in combination with controlled residence time in a balanced fluidized bed is the possibility to create a semi-milling effect. Size uniformity of the fibres can be controlled

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

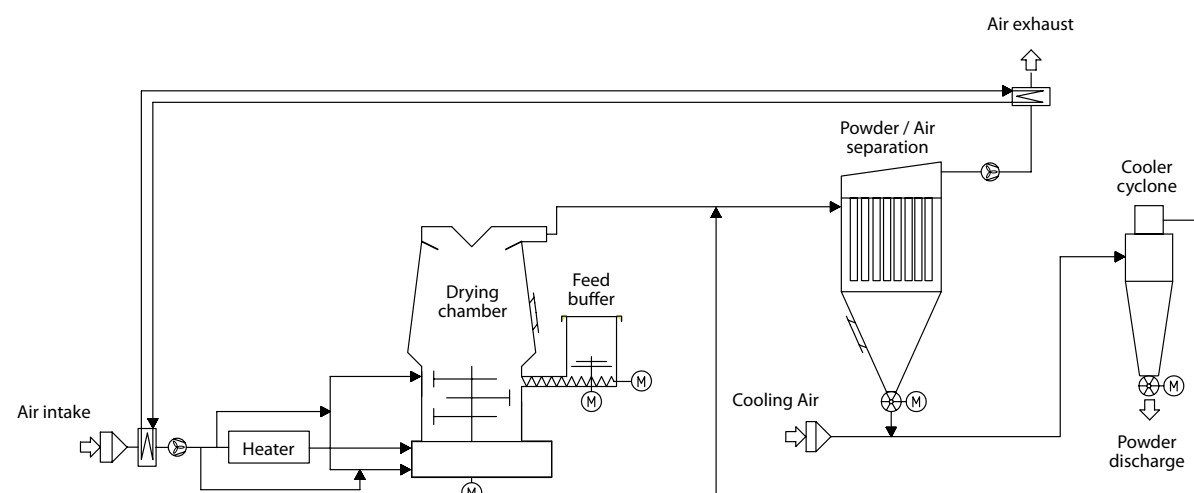
exercises certain particle-size control, and then fed into a powder separation system based either on cyclone or filter. Often a powder cooling step is introduced at this point in order to flash cool the powder prior to bagging. The LARSSON Whirl Flash™ dryer can be customized based upon requirements and preferences about heating technologies and emission standards. Further, the dryer's components can be designed to fit in existing facilities



Principle Layout including Heat Recovery System



Principle Process Flow Diagram



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.

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

LARSSON Whirl Flash™ Dryer

GLWF

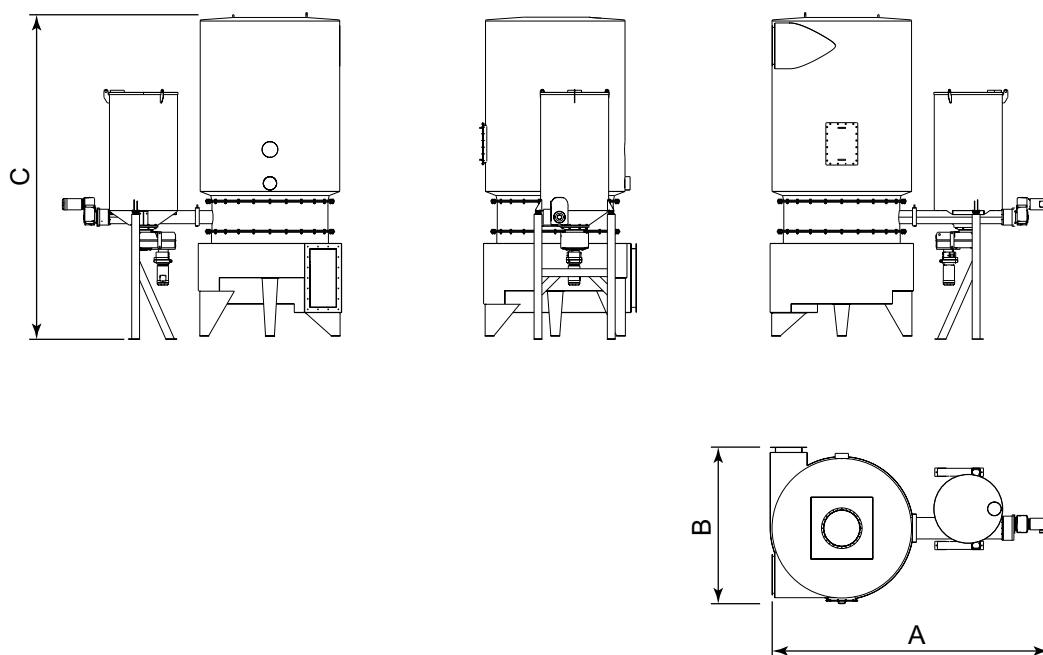
Technical Information

GLWF	Drying chamber		A [mm]	B [mm]	C [mm]**
	Rotor power [kW]*	Weight [kg]			
6	7.5	1120	2650	1450	2300
10	22	2050	3600	1850	3200
12	37	3000	4300	2200	3850
16	75	4450	5050	2500	4500
20	110	6800	5500	3000	5600
25	160	10500	6300	4000	7000
28	200	13000	7000	4700	7700

*) Rotor power figures are based on the product category: Starch, proteins and fibres. For different products please contact LARSSON

**) Without EX-device

General Dimensions



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