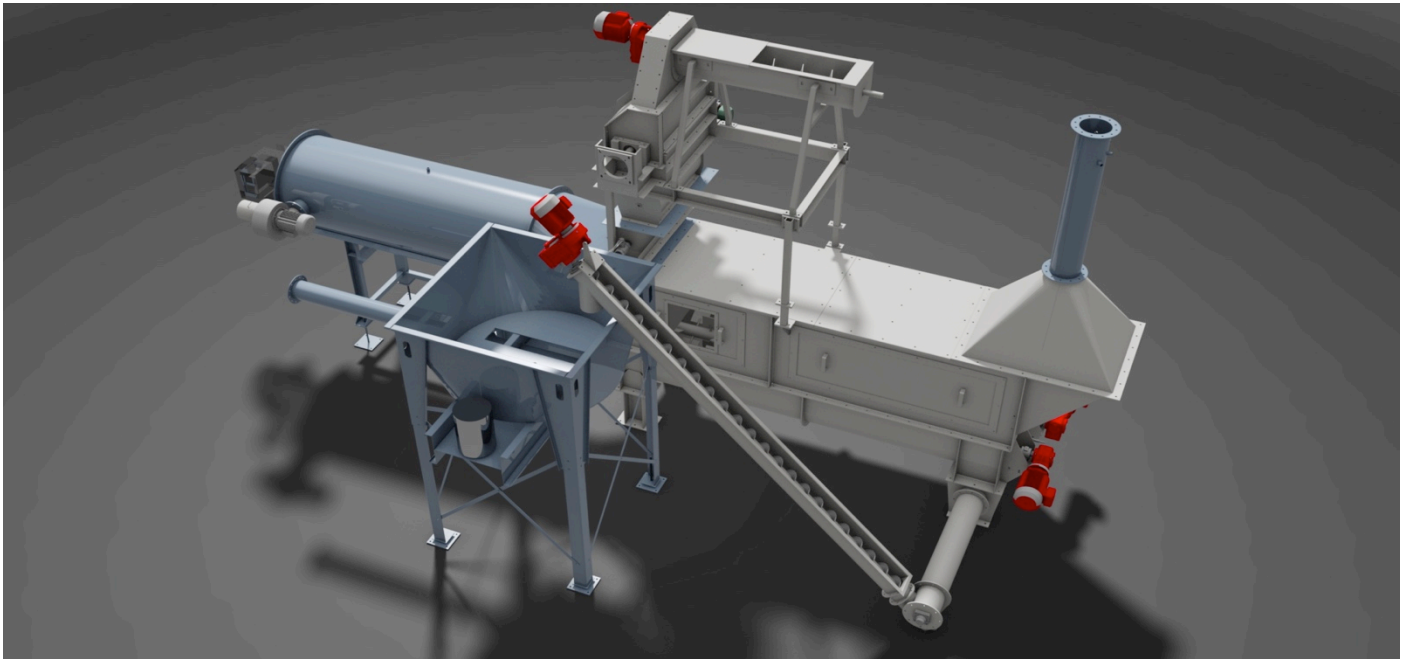


FACD-1 Dryer[®]

An innovative, efficient and compact drying solution for optimised water treatment sludge valorisation





”Pulsed Heat’s patented FACD-1 Dryer® (‘Falling Curtain’ Dryer) differentiates from competition by a unique, compact and flexible 4-stage design, combining the best advantages of two proven drying principles and providing energy and cost efficient sludge valorisation”

Pulsed Heat’s FACD-1 Dryer® combines the best advantages of two proven drying principles, flash drying and direct-heat rotary drying, into a single powerful system, reducing costs, enhancing plant performance and providing valuable valorisation opportunities. As a result, the FACD-1 Dryer® accomplishes superior secondary water treatment sludge and provides energy efficient solids handling reducing overall operational costs.

The FACD-1 Dryer® is characterized by a very rigid and reliable design delivering superior performance under the most demanding conditions for many possible sludge types with consistencies ranging from viscous liquids to compressed fibrous structures (not pumpable). Four main parts can be distinguished: a feeding module with an inlet section, a flash drying unit, a residence chamber and an outlet section. The FACD-1 Dryer® is operated in a continuous operation mode.

The sludge is supplied to the feeding module, which converts each type of stream perfectly into a stable and uniform infeed into the dryer. The feeding module includes a transport system, a crusher (in case of fibrous consistency feed), a rotary valve and a spading screw. In the inlet section the sludge is spread over the width of the dryer after which it falls by gravity into the flash drying unit. In the flash drying unit the ‘curtain of sludge’ collides perpendicularly with the high velocity hot flue gas stream and consequently dries instantly to the immobilisation phase. In the third step - the

residence chamber - the immobilised sludge is dried further by direct contact with the hot flue gas. The temperature of the hot flue gas has decreased considerably after the flash drying step and heat transfer is continued in the residence chamber at a lower temperature, requiring a longer residence time. Two bottom-side counter-rotating screws - with a designated peddle arrangement - increase the contact between the solids and the flue gas ensuring optimal heat and mass transfer. The residence time is adjustable in order to optimise drying performance and the quality characteristics of the dried particles for each type of sludge. In the outlet section the wet exhaust gases are separated from the dried particles. This section utilizes a special design to guarantee a first and effective segregation of the fine particles and dust from the exhaust gases.

Due to the high drying temperature, the dried sludge particles from the FACD-1 Dryer are 100% hygienic and do not contain bacteria, fungi or ferment.

The required drying energy can be supplied from burning fossil fuels or biogas, but also from the dried sludge particles.

The dewpoint of the discharged exhaust gases is high as a result of the evaporated water from the sludge, allowing for extended waste heat recuperation for low-temperature heating applications.

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Performance and capacities

Typical energy efficiencies approach values of 3,0 MJ per kilogram of evaporated water. Dryer capacities up to 2 MW_{th} per dryer will be customized and designed by Pulsed Heat depending on the specific application and waste stream type.



Dimensions, size and weight

Typical dimensions are 0,8 m. (W) x 0,8 m. (H) x 2,0 m. (L) with an empty weight of 2.000 kg.



Operational costs

Overall operational costs are extremely low in case the dried sludge granulate is recycled (partly) as a fuel. The installed electrical power equals <3 kW_{el} per MW_{th}. Dryer operation is fully automated, requiring minimum operational attention. Due to the simplicity of the design and the minimum number of rotating parts the maintenance demand is low.



Scope of delivery

The FACD-1 Dryer[®] is delivered as a complete, floor-mounted unit including process automation (S7 PLC/OP), instrumentation, electric motors and pre-cabling. Utilities and electrical supply have to be connected to a central interface. Exhaust gas treatment and dried sludge particles storage or handling can be supplied by the customer or by Pulsed Heat.



References

In Eerbeek (The Netherlands), a 1 MW_{th} FACD-1 Dryer[®] is installed at Industrie Water Eerbeek, a paper industry waste water treatment plant, for a sludge valorisation capacity of 16.000 tons of wet sludge per year.

Disclaimer

FACD Dryer® is a trademark of Pulsed Heat BV, its affiliates or subsidiaries.

The information provided in this brochure contains merely general descriptions or characteristics of performance which in actual case of use do not always apply as described or which may change as a result of further development of the products. An obligation to provide the respective characteristics shall only exist if expressly agreed in the terms of the contract.

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