

GKT

Sludge Drying

Energy-efficient sludge drying with thin-film technology and industrial heat pump system.

GKT-SOLUTIONS.COM

A Member of
Dr. Aichhorn Group

Less energy.
More drying efficiency.

High-performance thin-film drying for varying sludge properties, precise dry solids control and reduced operating costs.

Municipal and industrial sludge typically contains high amounts of water and can vary significantly in composition and handling characteristics. Efficient drying therefore requires a robust process that provides reliable operation while keeping energy consumption and operating costs under control.

Drying reduces sludge volume and prepares the material for further treatment or utilization, including phosphorus recovery and thermal processes such as incineration or gasification.

Challenges in sludge drying

High energy demand
With a water content of up to 80%, sludge requires significant amounts of energy to remove moisture.

Variable sludge properties
Fluctuations in composition, consistency, and handling characteristics make stable and reliable drying more challenging.

High operating costs
Energy consumption, investment costs, and maintenance requirements can significantly affect the overall economics of sludge drying.

Odor emissions
Odors released during sludge drying can require extensive exhaust air treatment, increasing process complexity and operating costs.

The thin-film drying principle

GKT horizontal thin-film dryers are designed for reliable and energy-efficient sludge drying. The sludge is continuously distributed as a thin film across the heated surface. Rotor elements continuously renew the product film and convey the material through the dryer. Their mechanical action helps minimize deposits on the heating surface, supporting stable peration even with challenging sludge properties.

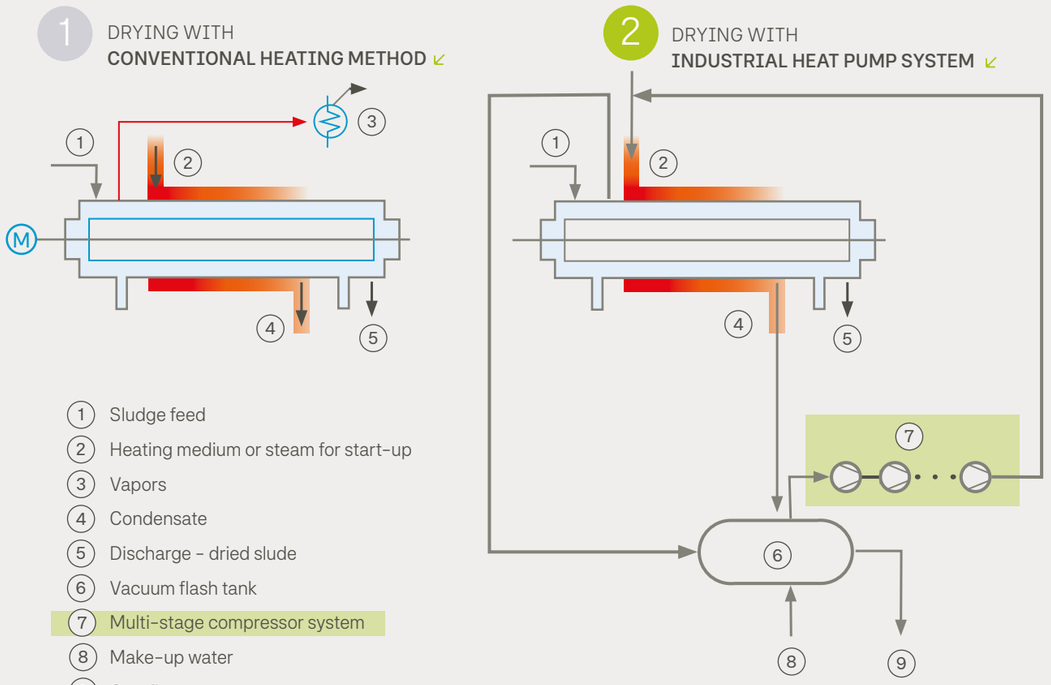


Horizontal thin-film dryer by GKT





GKT thin-film dryer for reliable performance in municipal and industrial sludge drying



Funcional principles - thin-film drying

©GKT

Energy-efficient sludge drying AT LESS THAN 0.5 kWh/kg of evaporated water.

Controlled drying for downstream processes

GKT thin-film dryers combine high evaporation performance with short residence times and precisely controlled drying conditions.

The short residence time enables accurate adjustment of the final dry solids content to downstream process requirements. Depending on the application, the technology supports partial drying to 40–60% dry solids as well as full drying to 80–95% dry solids.

The closed evaporation system operates with low air volumes, helping to minimize odor emissions and reduce exhaust air treatment requirements.

Explore further insights

Energy-efficient drying with industrial heat pumps

Combining thin-film drying with industrial heat pump technology, such as mechanical vapor recompression (MVR), significantly reduces the external energy demand of the drying process.

With MVR, the vapor generated during drying is compressed by an electrically driven compressor. The resulting increase in temperature and pressure allows the vapor to be reused as a heating medium within the process.

By recovering and reusing this energy, MVR reduces the demand for externally generated steam and, consequently, the consumption of fossil fuels such as natural gas. This can significantly reduce CO_2 emissions associated with steam generation and makes the technology particularly attractive for sites without an external steam supply.

Advantages

- Reduced energy consumption and operating costs with MVR or industrial heat pump integration
- High specific evaporation performance for efficient drying
- Reliable operation with low maintenance requirements
- Flexible operation with varying sludge properties
- Partial drying to 40–60% and full drying to 80–95% dry solids
- Minimal odor emissions through closed-system operation with low air volumes

WE ENGINEER GREEN KEY TECHNOLOGIES

E-01-2026

GKT is a globally operating system partner for thermal separation and environmental technologies – built on nearly 90 years of metalworking expertise and today defined by deeply rooted process engineering competence. In an industry where resources, circularity, energy, and CO_2 determine competitiveness, we make challenges technologically manageable and economically effective.

Our approach:
We Engineer Green Key Technologies.

We develop and implement key industrial technologies – from falling-film, thin-film, and short-path evaporators to distillation and drying, as well as CO_2 valorization, waste heat recovery, and IIoT-enabled process optimization.

As part of the Dr. Aichhorn Group, we validate processes in our own technical center under real operating conditions and scale them up to turnkey EPC facilities.

For our customers, this means maximum efficiency, reduced energy consumption, lower CO_2 emissions, and stronger economic viability – proven worldwide through numerous successfully executed projects.

GKT GmbH
Neusiedlerstrasse 15-19
2640 Gloggnitz, Austria

T +43 2662 42780
office@gkt-solutions.com