



Sludge Drying

Efficient and sustainable drying with
thin-film dryer and industrial heat pumps

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When managing the steadily growing volumes of municipal and industrial sludge, plant operators must comply with numerous legal and environmental regulations.

Traditional disposal methods, such as the agricultural use of sewage sludge or landfill disposal, are outdated or partially already prohibited.

At the same time, **phosphorus recovery** from dried sewage sludge is gaining importance due to stricter sustainability regulations.

Finally, dried sludge can be used as a **valuable energy source**, for example through incineration or gasification.

Our horizontal dryers are based on our proven **thin-film evaporation technology** and are powerful and cost-effective.

Operating principle

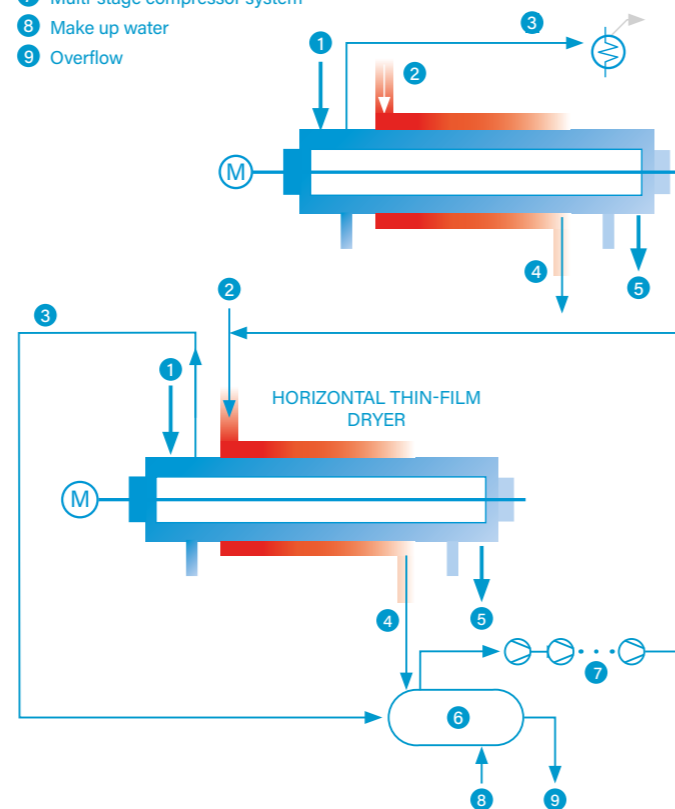
The medium is continuously distributed over the heating wall, while special wiping elements renew contact with the heating wall and transport the product flow forward.

Thanks to a defined gap between the rotor blades and the heating jacket, crust formation is avoided, allowing liquid substances to be dried into powder form despite the gentle process.

Challenges:

- ◆ **High energy consumption**
Sludge drying requires a lot of energy to efficiently evaporate the high water content (up to 80%).
- ◆ **Fluctuating sludge properties**
Varying compositions demand flexible drying methods.
- ◆ **Cost efficiency**
Energy consumption, investment, and maintenance costs must be economically viable.
- ◆ **Odor issues**
Drying can lead to odor problems, especially in urban areas.

- 1 Sludge feed 25% DS
- 2 Heating medium or steam for start-up
- 3 Vapors
- 4 Condensate
- 5 Discharge - dried sludge 45% DS
- 6 Vacuum flash tank
- 7 Multi-stage compressor system
- 8 Make up water
- 9 Overflow



Top: Drying with conventional heating method
Bottom: Drying with industrial heat pump system © GIG Karasek



Horizontal thin-film dryer © GIG Karasek

Application area: Sludge drying

GIG Karasek thin-film dryers enable gentle drying with high evaporation performance.

Thanks to the short residence time of the sludge in the apparatus, the dry solids content can be precisely adjusted to meet the requirements of downstream incineration plants. The technology is ideal for various sludge compositions and effectively prevents sticky deposits through mechanical cleaning of the heating surfaces. The drying process operates with minimal air volumes and within a closed evaporation system, significantly reducing odor emissions compared to belt dryers.

Sustainability through industrial heat pump

The combination of thin-film dryers with **industrial heat pumps**, such as mechanical vapor recompression, makes the drying process significantly more sustainable.

In this process, steam is compressed by an electrically driven compressor and reused to heat the evaporator at an elevated temperature and energy level.

This technology is particularly advantageous at locations without external steam supply, as it significantly reduces both lifecycle and operational costs, as well as energy consumption.

VORTEILE

- ◆ High specific evaporation performance for **efficient drying**
- ◆ **Precise control** of dry solids content due to short residence time
- ◆ **Flexibly adaptable** to various sludge compositions
- ◆ **Suitable for partial and full drying** (40-60% or 80-95% dry solids content)
- ◆ **Reliable operation** with minimal maintenance requirements
- ◆ **Minimal odor emissions**
- ◆ **Significant energy and cost savings possible** through combination with industrial heat pump/MVR (mechanical vapor recompression)



Want to learn more?
Watch our video!



APPLICATION AREAS:

- ◆ Sewage sludge
- ◆ Process and industrial sludge
- ◆ Municipal sludge

ANY QUESTIONS?



Learn more and book a consultation today!
office.gigkarasek@gigkarasek.at



We develop ♦ efficient ♦ competent ♦ cooperative ♦ proactive ♦ goal-oriented ♦ reliable customized process solutions and systems according to your requirements.

Regardless of the scope of services, our aim is to optimize your production facilities with tailor-made solutions in terms of product quality and processes. Where other companies reach their limits, we find ways to process your material flows by combining various process steps that have been developed over decades. A high level of expertise and personal all-round service make GIG Karasek your reliable partner for unique challenges.



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GIG Karasek GmbH
Neusiedlerstrasse 15-19
A-2640 Gloggnitz
+43 / 2662 / 42780
office.gigkarasek@gigkarasek.at

www.gigkarasek.com

