

ENORMOUS COST SAVING POTENTIAL IN SLUDGE DRYING



Drying of pre-dewatered sludge may tremendously reduce disposal cost. The energy-saving heat pump based condensation drying technology offers excellent prospects.

Forward-looking companies of any size always seek to optimize their processes and to minimize or even eliminate unnecessary cost. As far as waste water treatment is concerned, there is a final step in the process that may be used to realize high cost savings. What we are talking about is sludge drying, the drying of filter-pressed sludge. If as-pressed sludge is brought to a disposal site operators will pay about 60 percent of their total disposal cost only for water. This corresponds to the amount of humidity still contained in the sludge.

Nicola of Tett nang, Germany, realized this situation as early as 26 years ago. Waste disposal prices were already high at that same, as was the potential for cost savings. The company, a specialist for electroplating metallic materials and a supplier to the aircraft and automotive industry, among others, did not have to look too far to find a competent partner for energy-saving sludge drying. Drying system manufacturer Harter is based only 40 kilometres away. Harter marketed the so-called heat pump based condensation drying method almost 30 years ago. The technology was initially used exclusively for

drying pre-dewatered sludge. With continued development, its application was expanded for use in manufacturing processes. Harter has since employed their alternative drying technology in the whole surface treatment field.

AS MUCH AS 60 PERCENT COST REDUCTION

Nicola bought a Drymex M4 type sludge dryer then. This series model processes one ton of sludge a day. Leaving the chamber filter press the sludge falls into the drying container. The container has inbuilt castors for ease of moving to the drying system where it is automatically connected to an air duct. The humidity content of the sludge is about 70 to 75 percent at this time. The sludge is now dried at about 50 °C for 24 hours. The final humidity content is only about 20 percent as applicable to the type of sludge being dried. Weight and volume are reduced by as much as 55 percent. Disposal cost is reduced likewise.

While one load of sludge is being dried, a second container is waiting below the chamber filter press to be filled with sludge for the next drying cycle. Following drying, the sludge is tipped into a big transport container and brought to the disposal site. The water extraction rate of this sludge dryer is about 500 l per day. The rated power of the system in production operation is 7.9 kW.

HEAT PUMP FOR EFFICIENCY

Heat pump based condensation drying means that the process air is dehumidified again and again. Extremely dry and thus unsaturated air is passed through the material to be dried at a high flowrate. The air absorbs humidity in this process. Afterwards the humid air is cooled in the dehumidification module, the water condenses, and the condensate is drained off the system. Then, the air is reheated and returned to the drying

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01 Drymex M4 dryer processes one ton of sludge a day

02 Sludge after drying – weight and volume are reduced by as much as 55 percent

container in a circuit closed air-wise. Drying is such almost free from emission and completely independent of the climatic conditions and the seasons. The heat pump technology used on every dehumidification module provides highest efficiency. The power consumption for every litre of water extracted is only 0.4 kWh.

Another major factor for optimum drying is air routing. The dry air must be routed appropriately to actually arrive at the place(s) where it is supposed to absorb humidity. For this purpose, the sludge drying containers feature a special aeration bottom and an elaborate air routing system. This ensures that the air passes evenly through the sludge and that a uniform drying result is obtained.

PRODUCTION EXPANSION

Nicrola's first sludge dryer has meanwhile reached "old age" and is still working satisfactorily which is proof of good material quality and robustness. As Nicrola has expanded and is planning to further expand their production, they have invested in another series dryer. They are thus well placed for the future and can minimize both disposal and transport cost for their sludge.

They have also a barrel dryer in operation for 20 years. This dryer is used for direct in-barrel drying of surface finished bulk products and ensures reliable and gentle drying. This dryer is also evidence for the enormous reliability of this type of technology.

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