



Exergy Sludge Drying

Sludge is a renewable bio-fuel!

Introduction

Treatment of municipal and industrial waste water generates huge amount of sludge. This must be disposed off correctly.

Some of the industrial sludge is toxic and can damage the environment but majority of sludge from effluent treatment plants is a renewable energy source provided it can be dewatered and dried.

Exergy Super Heated Steam dryer is the right technology for drying all types of sludge with several advantages.

Exergy Steam Dryer

Basic Process

Moist sludge is dried in Exergy dryer in a closed loop through suspension in super heated steam. Steam is generated from product moisture. Drying energy is supplied by indirect heating of the drying steam to attain certain level of super-heat. Steam and sludge in suspension is transported by a fan from feeding to discharge via a cyclone.

Sludge Drying

Mechanically dewatered wet sludge with 20-30% dry matter is fed to a mixer. Dried product is mixed with wet sludge to increase the dry substance level to 60-70%. At this point the sludge becomes friable and can be fed into the dryer via a rotary valve. Within 5-10 seconds, the sludge is dried to 90-95% dry substance and discharged from the dryer through another rotary valve. Part of the dried product is re-circulated to the mixer.

Water in the sludge becomes steam in the dryer and is discharged through a pressure control valve to maintain constant pressure in the dryer.

Heating media

Exergy dryer can be indirectly heated by steam, hot water, thermal oil, gas, bio-fuels, dried sludge etc. Hot air from biogas or natural gas can also be used as heating media.

Heat Recovery

The generated steam from the dryer is available at 0,5-4 bar (g) and can be used within the effluent treatment plant or another process. The recovered heat is about 70-90% of total drying energy to the dryer.

Emission free dryer

Closed loop ensures no emission of smell or particles to the atmosphere. Non-condensable gases are incinerated. Condensate from generated steam is recycled back to the effluent treatment plant.

Low Running Costs

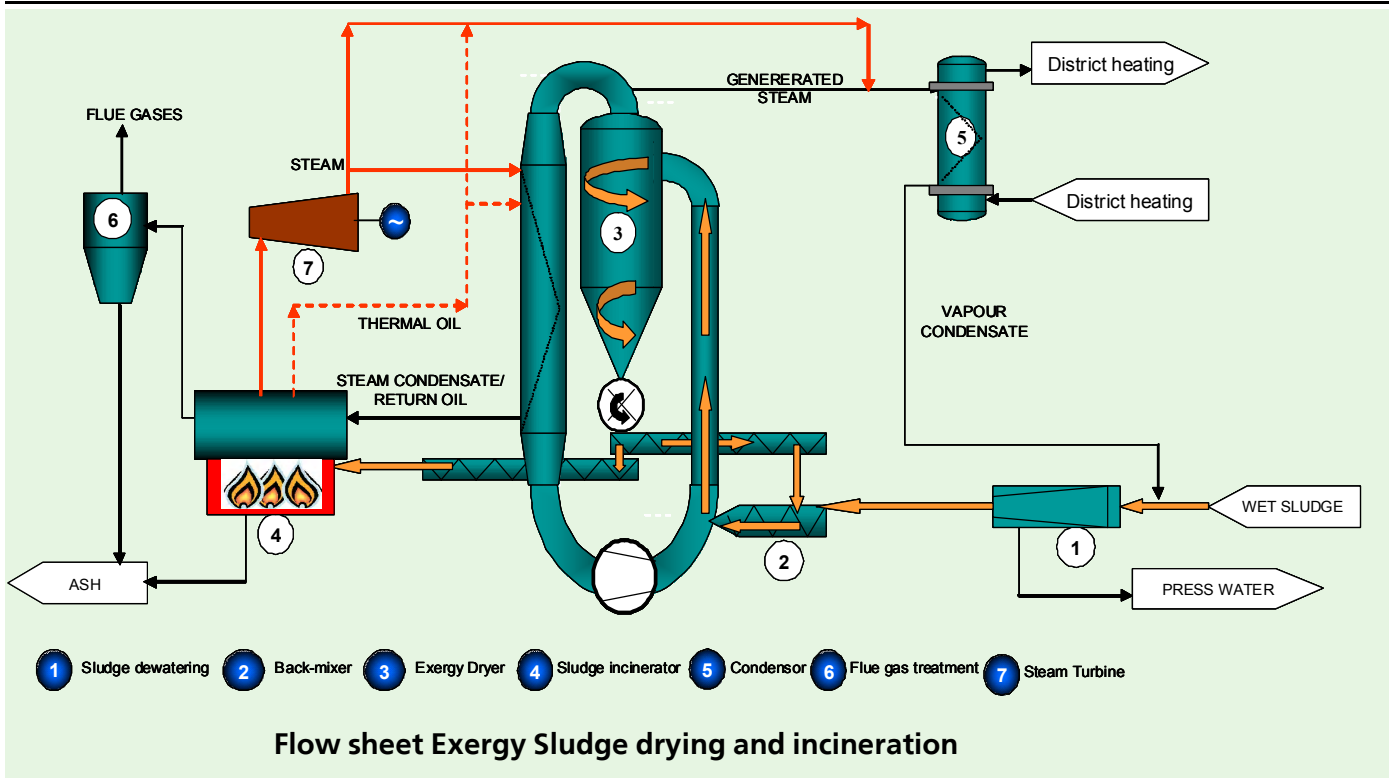
Exergy dryer has very few rotating parts meaning low service and maintenance costs.

No fire or explosion

Steam inside the dryer ensures fire and explosion free operation. Huge investments in expensive equipment for ATEX compliance are not required with Exergy Dryer.



Exergy Sludge Dryer



Incineration

The Exergy dried sludge is a bio-fuel. Even bio-digested sludge has a heat value about 10 MJ/Kg DS or 3 MWh/ton DS.

This can either be used as bio-fuel in a stand-alone system or mixed with other bio-fuel in an existing system. Together with recovered energy from the Exergy dryer, 80% of heat value can be used for electrical power and/or district heat production.

Ash handling

The ash can be used for different purposes. One possibility is to recover phosphorous and other chemicals.

Final Product

The dried sludge can be compacted using simple methods to reduce volume 3-5 times for easy transport. More defined product can be produced by briquetting, pelletizing or granulating. These products can be used a fertiliser in agriculture or forestry.

The Exergy dried sludge is sterilised and has no microbial activity whatsoever!

Flue gas treatment

Both wet and dry flue gas treatment methods are available. The table shows gas analysis data after flue gas treatment from fluid-bed combustion with lime absorption and a suppression filter.

Content mg/m ³	Daily average	Limit Values
Dust	< 1	10
VOC	5,8	10
HCl	8,6	10
HF	-	1
SO ₂	16,1	50
NO _x	134	200
Metals kl. I	0	0,1
Metals kl. II-III	-	0,5

Flue gas analysis for sludge incineration plant



Dried Sludge - Powder, granules and briquettes.

For more information, calculations and quote, please contact us at:

