

# 6 Mechanical Sludge Dewatering Methods

Sludge dewatering is a separation method of solid and liquid components for easily and more cost effectively handle the separate phases for final dry disposal.

Sludge dewatering reduces the weight and volume of solid waste, resulting in a larger environmentally friendly product. This product can be transferred to landfills with minimal environmental impact, which can effectively incinerate and reduce moisture. Now we introduce 6 sludge dewatering methods as below:

## 1.Filter press

Chamber filter press(or plate and frame filter press) is one of the mechanical pressure dewatering methods, that use filters to separate the liquid from sludge. There are manual, semi-automatic and automatic filter presses available.



The chamber filter press is composed of filter plate and filter cloth that arranged to form a plurality of independent filter units. The slurry is driven by feed pump, enters each filter chamber, and is filtered by the pressure generated by feed pump.

Due to the action of filter cloth, the solid is left in the filter chamber to form a filter cake, and the filtrate outlet valve is discharged. And the filter cake can be pressed to further reduce moisture content if necessary by introducing compressed air or high-pressure liquid.

Advantages	low water content of mud cake, about 40%;wash the mud cake evenly; less loss during feeding;high temperature and pressure resistance; good sealing performance;basically applicable to all solid-liquid separation industries.
Disadvantages	intermittent operation; relatively low efficiency.

## 2.Belt filter press

Belt filter press is a widely used filter belt extrusion dewatering equipment.

The dewatering process can be divided into four important stages: pretreatment, gravity dewatering, pre-pressure dewatering in the wedge zone and press dewatering.

A certain concentration of flocculant needs to be mixed with the slurry to make the tiny solid particles in the sludge coagulate into a large floc-like mass and separate the free water.



Advantages	continuous operation; high efficiency; run smoothly; commonly use.
Disadvantages	high water content of mud cake.

### 3.SludgeDewatering Centrifuge

Centrifugal sludge dewatering machine is composed of transfer and screw conveyor with hollow shaft. The sludge is sent to drum by hollow shaft and is inserted into the drum cavity under the centrifugal force generated by the high-speed rotation.

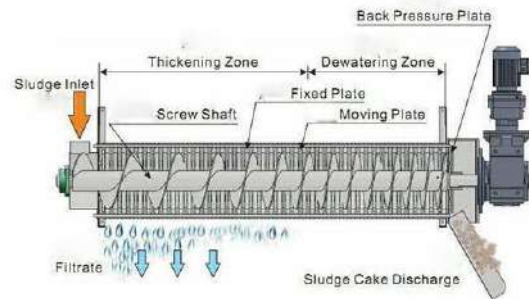


Due to the different specific gravity, solid-liquid separation is formed. The sludge is conveyed to the cone end of drum by the auger and continuously discharged from the outlet; the liquid in the liquid ring layer is discharged by the continuous overflow of the mouth to the drum and discharged by gravity.

Advantages	high processing capacity.
Disadvantages	high power consumption; large noise; hard maintenance; not suitable for solid-liquid separation with close specific gravity.

### 4.Screw press dewatering machine

The screw of screw press dehydrator is installed in a cylinder composed of screen, and the diameter of screw body gradually becomes thicker from the inlet to outlet.



As the volume between screw blades becomes smaller, the dewatering material is gradually compressed. The solid and liquid in the dewatering raw material are separated by compression, and the filtrate is discharged through the mesh of sieve, then flows to the filtrate collecting tank below the dehydrator and is discharged to the outside of the machine.

Advantages	continuous dehydration; simple structure; low noise; less wearing parts; simple daily management.
Disadvantages	only suitable for handling high fiber sludge.

## 5. Stacked type sludge dewatering machine

The stacked sludge dehydrator is formed by fixed ring and swimming ring which are laminated to each other, and a screw shaft is formed therethrough.



Full dehydration is achieved by gravity concentration and the internal pressure of sludge formed by the back pressure plate during the propulsion process. The filtrate is discharged from the filter slit formed by the fixed ring and the movable ring, and the mud cake is discharged from the end of the dewatering portion.

Advantages	self-cleaning; no blocking; power saving; no noise; fully automatic; can direct dewatering for low concentration sludge.
Disadvantages	small capacity; not good at dewatering sludge with large particles and high hardness.

## 6. Geomembranes

Geomembrane is suitable for light sludge dewatering (low ratio of solid to water in sludge). This technique is commonly used for basic types of residues from wastewater, sedimentation tanks and water filtration equipment.



## LZZG recommend “sludge thickening and dewatering”

Equipment: deep cone thickener + filter press

deep cone thickener + belt filter press



Sludge dewatering working site in Sri Lanka



Sludge dewatering for washing plant in Georgia

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