EKOSERVIS®
SLOVENSKO

LAMELLAR DEHYDRATOR - LDH

LAMELLAR DEHYDRATOR
FOR SLUDGE DEWATERING
Output Q = 0.70 – 25.0 $m^3.hr^{-1}$

APPLICATION

A spiral dehydrator is intended to use for sludge dewatering. The equipment is small size and small weight, operated automatically with minimum operation and maintenance demands.

It is produced in type range of various dimensions. Due to low CAPEX and OPEX it is eligible for application mainly on industrial wastewater treatment plants and for municipal WWTPs up to 10 000 PE. Another positive feature is capability to process sludge directly from the treatment process.

Dewatering equipment

Dewatered sludge

INLET SLUDGE

Out of the treatment process, concentration of insoluble substances IS = 4 kg.m^{3}, or thickened out of the sludge tank of concentration IS = 40 - 60 kg.m^{3}.

DEWATERED SLUDGE

Dry solids of dewatered sludge IS = 18 – 25 %.

DESCRIPTION

Sludge is pumped to the storage tank of the dehydrator automatically controlled based on level line inside the tank. It is pumped from the storage tank by a volumetric pump to the flocculation tank to mix with a polymer and flows to the dewatering equipment. Output quantity for dewatering is set up by the pump output and bypass between the dehydrator and the storage tank.

DEWATERING PRINCIPLE

Sludge from the flocculation tank flows to dewatering equipment consisting of the drum sheet, screw and a set of fixed and moving lamellas. The lamellas are separated from each other by gaps of various width inside a thickening, dewatering and compression zones.

Type range of dewatering lamellar dehydrator - LDH

model	indicator	unit	ESX-131	ESX-201	ESX-301
excess sludge from the activation 2-6 kg.m^{-3}	output	kg.CS*/hr	10	20	50
	quantity	m^{3}/hr	5 - 1,7	10 - 3,3	25 - 8,3
thickened sludge from the sludge tank 2,0% - 8,0%	output	kg.CS*/hr	20	50	120
	quantity	m^{3}/hod	0,2 - 0,13	4,0 - 0,25	2,5 - 0,63
el. power consumption	total	kW	0,2	0,65	0,8
flocculant consumption		g/kg CS*	3,0 - 5,0	3,0 - 5,0	3,0 - 5,0
dimensions	length	mm	2200	2600	3100
	width		640	750	850
	height		1050	1350	1600
weight		kg	300	580	980

***CS - total dry solids in the sludge**

The screw by its gravity movement pushes sludge onto the moving lamellas, cleaning the space between the lamellas and providing for the filtrate outflow. Sludge falls off the dewatering equipment to the container.

DESIGN INPUTS

LDH size is based on the production of excessive sludge and dewatering time set in the operation mode.
Required inputs:

- daily production of excess sludge
- sludge concentration
- sludge take-off point (process, sludge tank)

CAPEX

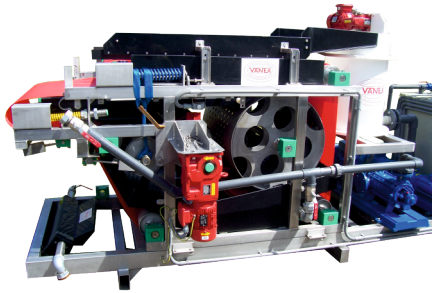
Capital investment for dewatering system includes:

1. lamellar dehydrator
2. flocculant preparation unit
3. low voltage, switchboard, automated control system
4. sludge inflow to storage tank

model		ESX-131	ESX-201	ESX-301
kg.CS*/hr		10	20	50
Number of PE	**Excess sludge produced kg.d^{-1}**	**Time to dewater excess sludge hrs/day**		
500	20 - 24	2 - 2,4	1 - 1,2	0,4 - 0,5
1000	40 - 50	4,0 - 5,0	2 - 2,5	0,8 - 1,0
1500	60 - 72	6,0 - 7,2	3,0 - 3,6	1,2 - 1,4
2000	80 - 100	8,0 - 10,0	4,0 - 5,0	1,6 - 2,0
2500	100 - 124	10,0 - 12,4	5,0 - 6,2	2,0 - 2,5

OPEX DEPEND ON THE EQUIPMENT SIZE
Electric power consumption - **0,3 - 0,8 kWh**
Water for flushing - **24 - 40 l.hr^{-1}**

Comparison of dewatering system costs:

Equipment	Dehydrator	Centrifuge	Belt press
			
Energy	1	4	3
Water	1	2	4
Noise	1	4	3
CO_2 emissions	1	4	3
CAPEX	1	2	1
Total	**5**	**18**	**14**

*** 1 = low, 4 = high**

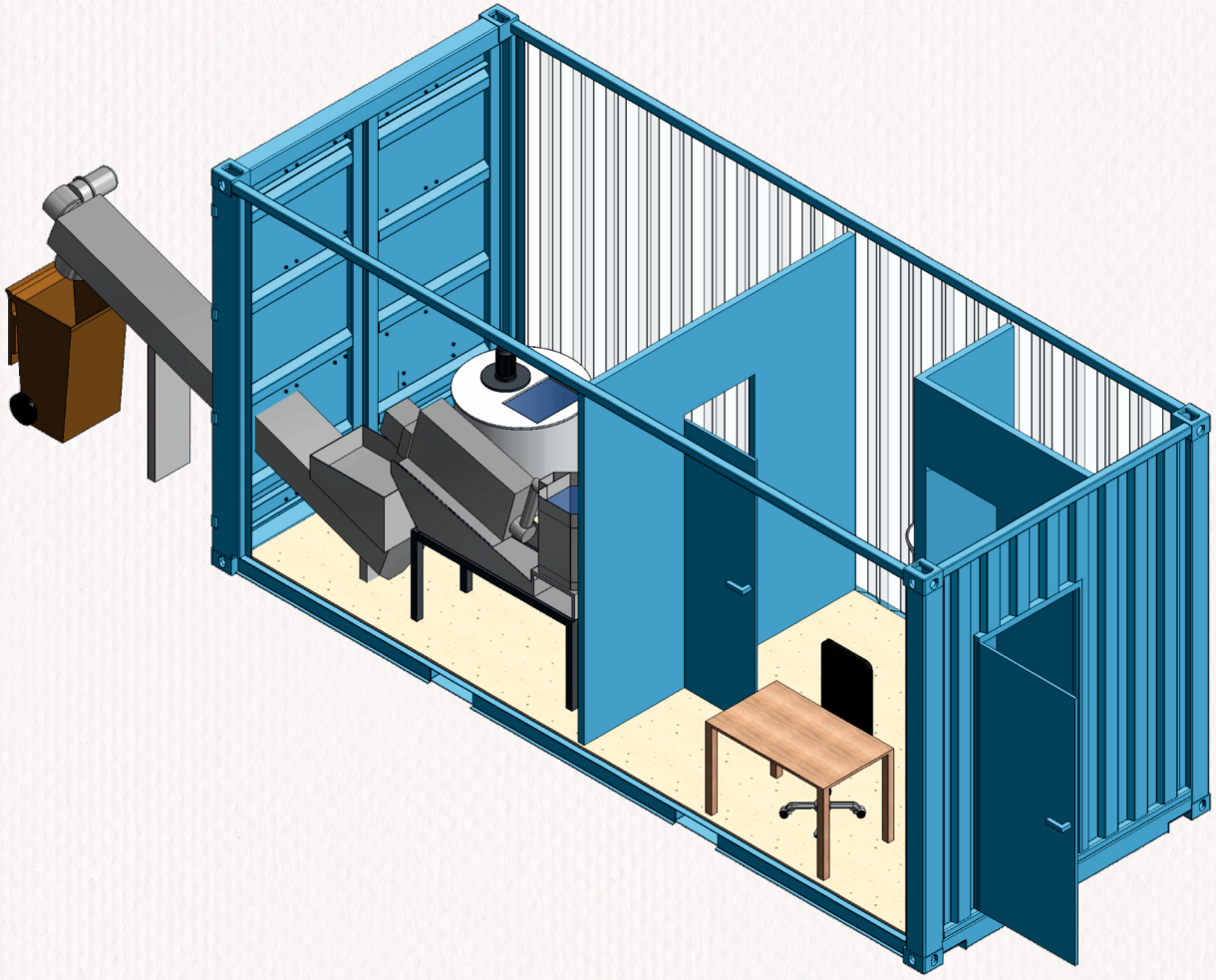
OVERALL ASSESSMENT
Lamellar dehydrator is intended for sludge dewatering from village and urban WWTPs to 10 000 PE, industrial WWTPs. Convenient for its dimensions, low CAPEX and OPEX.

Very good results achieved in the sludge with high content of grease and crude oil substances. Competitive advantages:

- low power consumption
- low water for flushing consumption
- automated operation
- easy service
- minimal service and easy access to technology equipment
- long service life

Delivery period 3 – 12 weeks depending on size.

Lamellar dehydrator



Dehydrator – container: 3D scheme

Lamellar dehydrator

Dewatering lamellas

Flocculation tank

Dewatered sludge

PURE WATER

FOR THE MANKIND

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