ESMIL GROUP

TSURUMI PUMP

Disc Press JD series

Efficient and reliable solution for dewatering of difficult sludge

- Handles a broad variety of sludge containing high levels of minerals and fats, as well as coarse, abrasive, and fibrous inclusions.
- For municipal, industrial and agricultural sludge.
- Economical solution with minimal service requirements.

The JD series Disc Press is the optimal solution for mechanical dewatering of wastewater sludge with high mineral content from municipal treatment stations, industrial, agricultural and food enterprises.

- Reliable dewatering of high mineral content sludge without abrasive wear and jamming;
- Highly efficient in dewatering carious types of sludge;
- No issue with sludges with high fat and oil content;
- Corrosion resistant due to the use of stainless steel and high-strength plastic;
- Simple maintenance and operation.

High mineral content Sludge Dewatering:

- 6-10 times sludge volume decreasing – thus making problematic sludges possible for disposal;
- No jamming;
- Lowest wear;
- Maximum reliability.

Dewatering efficiency of JD Disc Press:

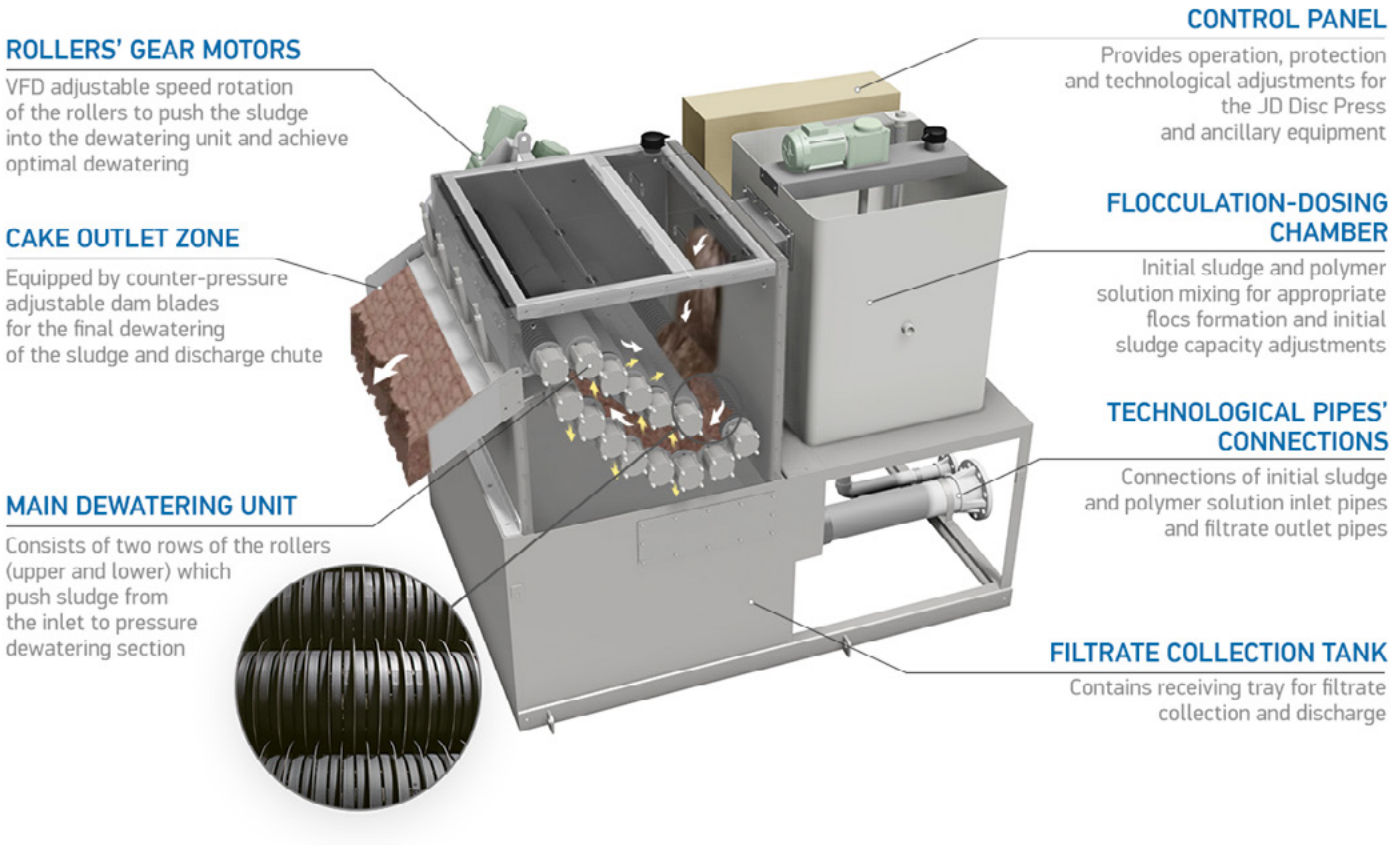
- JD Disc Press efficiently dewaters different kinds of sludges with wide range of sludge concentration (0.5~5%).
- Cake dryness depends on sludge water release properties and can reach even up to 30%.
- Reliable solution for dewatering of sludge with high mineral content (~ 60%).

Application Area:

The JD Disc Press efficiently dewaters various types of difficult sludge, including those with large, abrasive and fibrous inclusions and high fat content. This solves the problem of disposal of wastewater sludge in a variety of areas:

- Dewatering of sludge from small and medium-sized municipal wastewater treatment plants;
- Semiconductor and automobile factories;
- Food industry (dairy, meat, fish, beer and many others);
- Biogas complexes;
- Textile and tannery industry;
- Cosmetics, pharmaceutical industries;
- Pulp-and-paper and woodworking industries.

JD Disc Press Design



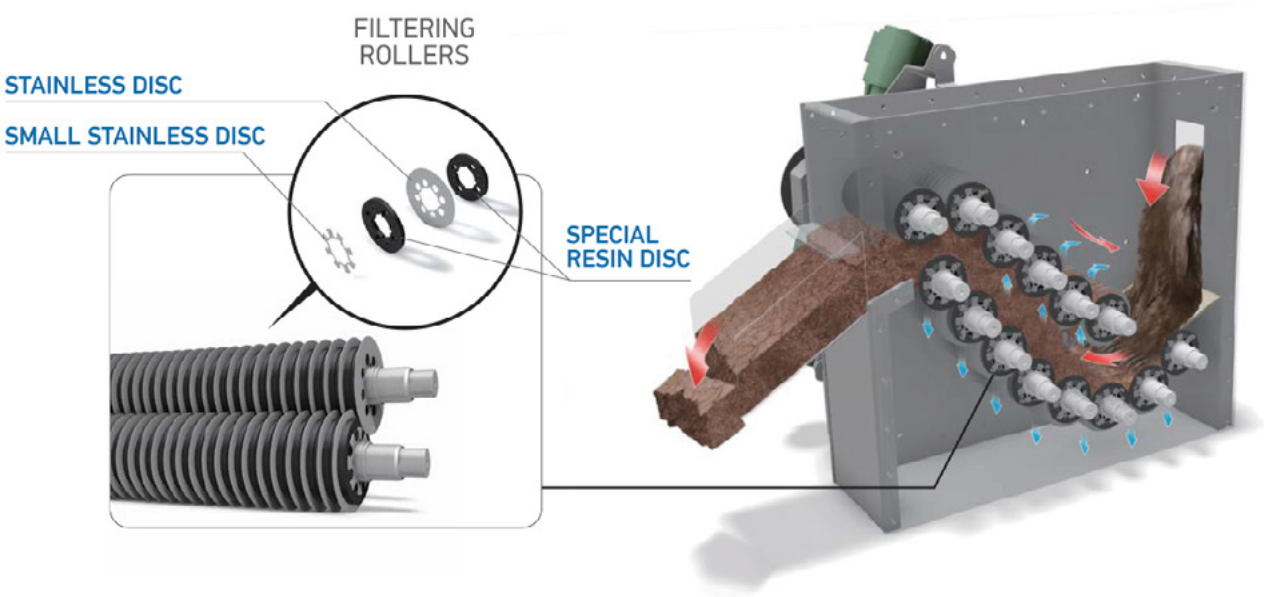
JD disc presses utilize both gravity filtration and compression dehydration systems. The "filtering rollers" consist of alternating thin metal discs and resin discs, and are arranged in two (upper and lower) tiers. The flocculated sludge is fed between the rollers and dehydrated by compression while being conveyed toward the sludge outlet by the rotating action of the rollers. Not only is the system highly energy efficient, the the discs are self cleaning and do not clog.

Flocculation chamber creates superior floccules:

- Multiple reagents technology can be applied (flocculation with coagulation if required).
- Mixing speed is variable.

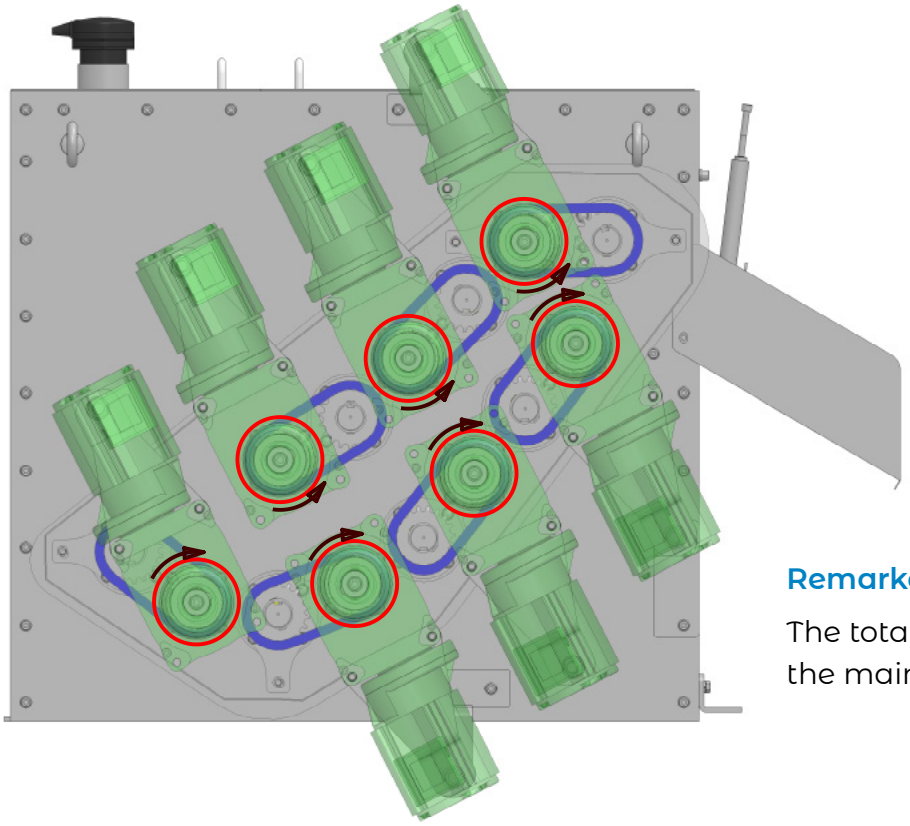
Well-grown sludge floccules are fed to dewatering unit through overflow by gravity reducing the chances of damaging floccules from pumping. An operator can visually control the flocculation process and adjust it to achieve the best possible results.

Mechanical Principle and Structure of Filtering Rollers



Motors scheme

JD has from 7 to 10 gear motors – - for filtration and dehydration sections. Each motor drives two shafts. It is possible to change rotation speed ratio of these two sections.

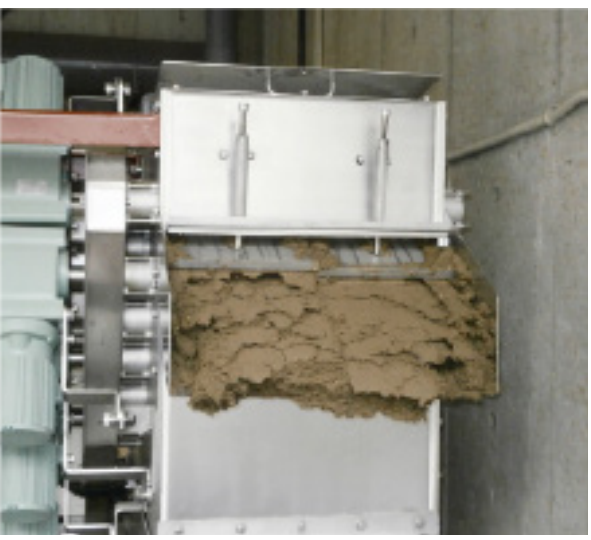


Remarkably low energy consumption

The total nominal power of the drives of the main dewatering unit is up to 2 kW.

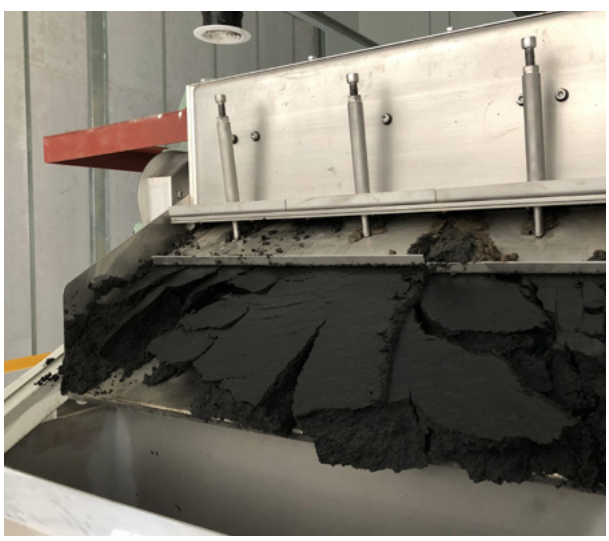
Advantages and Effective Technical Solutions

- Possibility of dewatering sludge with a low organic content, high content of abrasive particles, fibers, fats, oils and petroleum products.
- Reliable operation without abrasive wear and jamming, no problems even with large debris due to reverse mode.
- The distance between the rows of the upper and lower rollers is at least 50 mm, which allows working with sludge with large and fibrous inclusions without clogging the main dewatering unit with cake.
- Self-cleaning rollers design eliminates clogging problems and the need to shut down equipment to clean the filter surface.
- The self-cleaning effect of the filter pores eliminates the need for rinsing water.
- The equipment consumes significantly less energy than other dewatering systems.
- The total nominal power of the drives of the main dewatering unit is up to 2 kW.
- The press has a compact and closed design which requires only a small installation footprint.
- Low cost of operation.
- Reduced capital construction costs.
- Can be installed in container wastewater treatment plants and mobile units.

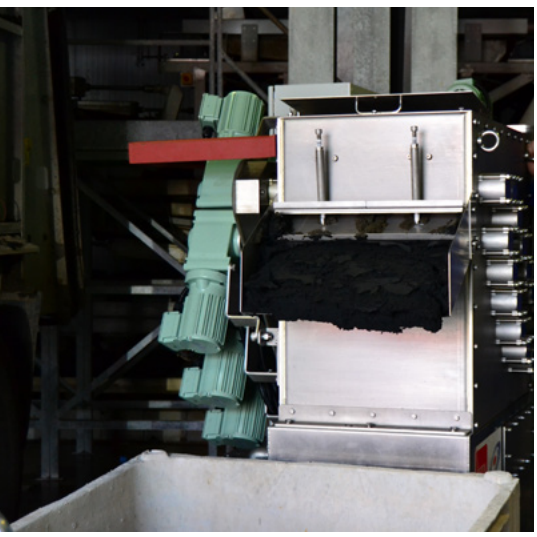


Simplicity, Reliability and Ease of Operation

- Low speed of rotation of the rollers (up to 1.5 rpm), and as a result, absence of noise and vibration during the operation of the assembly.
- No wear of main components and no need for bearing replacement due to rollers' low rotation speed.
- Simple maintenance can be performed by local personnel without special training.
- Quick access to the main units of the assembly.
- Protection against incorrect process settings and overflows.
- Simple and better flocculation adjustment due to easy access to the process tank.
- Electrical overload protection.
- Electrical surge protection.
- Convenient ergonomics (quick release covers).
- Simplified access to drive maintenance.
- Advanced automation: various modes and algorithms of work, synchronization of the dewatering complex with other equipment of treatment facilities.
- Built-in sludge conditioning (flocculation) system that does not require additional pieces of equipment and tanks.



More than 800 JD Disc Presses are installed and operate worldwide.



References

1) Food industry (Potato chips) wastewater treatment plant

Two units are installed at a food production plant (Potato chips) and are designed for dewatering of mixture of excess sludge and settling tank sludge. Inlet sludge DS concentration is 10.3% (VTS 43%) and outlet cake DS concentration is 30%.

2) Semiconductor Industrial Area

Two units are installed at a semiconductor production factory and are intended for the dewatering of excess sludge with lots of inorganic (raw material). Inlet sludge DS concentration is 4.7% (VTS 36,9%) and outlet cake DS concentration is 17%.

3) Automobile Assembly Factory wastewater treatment plant

One unit is installed at an automobile factory wastewater treatment plant and is dedicated for the dewatering of mixture of excess sludge and DAF sludge with lots of inorganic (paint and aluminum powder). Inlet sludge DS concentration is 2.2% (VTS 60%) and outlet cake DS concentration is 33%.

4) Biomass Power Plant

Three units are installed at a biomass power plant and are designed for the dewatering of anaerobically digested sludge. Inlet sludge DS concentration is 2.24% (VTS 60.5%) and outlet cake DS concentration is 20.5%.

5) Waste landfill

One unit is installed at a waste landfill site for the excess sludge dewatering. Inlet sludge DS concentration is 4.5% (VTS 25%) and outlet cake DS concentration is 19%.

6) Automobile Assembly Factory WWTP (Painting booth, Aluminum casting) sludge

One unit is installed at an automobile assembly factory wastewater treatment plant and is dedicated for the dewatering of mixture of excess sludge and DAF sludge (painting booth, aluminum casting). Inlet sludge DS concentration is 5.8% (VTS 40%) and outlet cake DS concentration is 27.3%.

Productivity of JD Disc Press

Model	Sludge concentration, %							
	Treatment capacity (kgDS/h) / related hydraulic capacity (m³/h), up to*							
	0.5%		1%		3%		5%	
	kgDS/h	m³/h	kgDS/h	m³/h	kgDS/h	m³/h	kgDS/h	m³/h
JD-250	6	1.2	10	1	15	0.5	20	0.4
JD-500	12	2.4	20	2	30	1	40	0.8
JD-750	18	3.6	30	3	45	1.5	60	1.2
JD-1000	24	4.8	40	4	60	2	80	1.6
JD-1500	36	7.2	60	6	90	3	120	2.4
JD-2000	48	9.6	80	8	120	4	160	3.2
XJD-1000	64	12.8	107	10.7	160	5.3	213	4.3
XJD-1500	96	19.2	160	16	240	8	320	6.4
XJD-2000	128	25.6	213	21.3	320	10.7	427	8.5

* The press throughput depends on the sludge TS concentration and sludge properties.

JD Disc Press Specification

Model	Total Motor Output, kW	Dimensions, mm				Weight, kg	
		Width of Filtering Rollers	Length	Width	Height	Dry	Operating
JD-250	0.82	250	2040	760	1455	770	1150
JD-500	1.63	500	2210	1035	1830	1100	1600
JD-750	1.82	750	2365	1285	1830	1300	1970
JD-1000	2.57	1000	2340	1535	1830	1500	2370
JD-1500	1.37	1500	2700	2110	1985	1900	2700
JD-2000	1.75	2000	2860	2610	2085	2250	3700
XJD-1000	3.3	1000	3850	1685	2250	3500	5000
XJD-1500	3.3	1500	4150	2185	2250	4100	6700
XJD-2000	3.3	2000	4350	2685	2250	5500	8000

Long Service Life Due To:

- JD Disc Press made of AISI 304 or AISI 316 stainless steel.
- Anti-corrosive treatment: volume etching and passivation by special process.
- Use of heavy-duty chains to drive rollers.
- Discs material is epoxy-based wear-resistant plastic and stainless steel.
- The shafts on which the discs are mounted are made of special extra strong stainless steel.

Solving Sludge Challenges with Expert Dewatering Solutions

Multi-disc Screw Press Dehydrator MDQ/MDQ-C series

- For municipal and industrial waste water treatment plants;
- Minimal service requirements;
- The productivity of single unit is up to 80 m^3/h (2800 kgDM/h).

The dewatering process provided by the MDQ Multi-Disc Screw Press Dehydrators is operated using minimal energy and requires the least amount of other resources (flocculant, rinsing water, wear parts), as well as minimal maintenance and staff supervision, compared to any other dewatering equipment.

The dewatered sludge after treatment in the dehydrator can reach a residual moisture content of 60-82% with an average flocculant dose of 1.5 – 3.5 kg/t of sludge dry matter.

Sludge Thickener MDQ-T

MDQ technology adapted for thickening is a new way to concentrate sludge from municipal and industrial wastewater treatment plants. ESMIL Tsurumi MDQ-T multi-disc screw press thickeners are reliable, productive and space-saving equipment while consuming a minimum amount of energy, water and reagents, as well as requiring minimal operator's and maintenance personnel's attention.

MODULE D

Containerized Mechanical Dewatering Plant based on multi-disc screw press MDQ ESMIL Tsurumi.

- Fully autonomous factory-ready installation (plug-and-play technology);
- Minimum requirement for design and permits;
- Compact design in 20' and 40' sea containers;
- Minimum operating costs (low consumption of reagents, wash water and electricity);
- Simplicity and ease of use – the complex is fully automated, remote control from a smartphone is possible;
- Mobility – the ability to easy transport of the unit from one site to another.

Screw Conveyor

- Wide range of performance and applications
- Available configurations: suitable for transporting various types of waste or sediments over long distances.
- Possibility of installation at an angle up to 30 degrees for axisless and up to 45 degrees for axial conveyors.
- The modular design of the screw conveyors allows a wide range of configurations.
- The conveyor may be hermetically sealed together with other units of wastewater treatment equipment.
- Special inserts of high-hardness steel alloys used in the casing, allow transportation of abrasive materials.
- The minimal gap between the casing and the screw guarantees high productivity.
- The use of a special worm gear motor by NORD Drive Systems ensures high-reliability.
- Production of conveyors in two versions: pushing or pulling.
- Flexible control of the conveyor operation, reduction of energy consumption and protection against power surges, which is ensured by the use of frequency control.
- Production of the screw in the form of separate sections without a central shaft.

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ESMIL Group

ESMIL Group proudly stands as a distinguished leader in the field of wastewater treatment equipment. Our primary focus lies in crafting and delivering high-quality equipment, catering specifically to municipal wastewater treatment and various industrial applications, including food processing, cement, chemicals, coal, and metal processing industries.

We offer a diverse product line featuring over 35 different types of top-notch equipment for mechanical treatment, biological treatment, and sludge dewatering. ESMIL Group takes great pride in delivering reliable and efficient equipment that meets the stringent demands of our customers.

In 2011, we further enhanced our reputation by securing an official contract with Tsurumi Pumps, a renowned Japanese company, for the licensed manufacturing of Multi-disc Screw Press Dehydrators MDQ/MDQ-C and Disc Press JD. This collaboration has allowed us to produce over 150 units of these advanced Dehydrators, further solidifying our commitment to providing top-of-the-line equipment.

With production plants strategically located in Poland, Ukraine, and the USA, ESMIL Group benefits from the expertise of over 150 highly qualified specialists who are dedicated to upholding our commitment to excellence. Our success knows no borders, as ESMIL equipment operates successfully in more than 35 countries worldwide. From Chile to the United States, from Germany to Singapore, our equipment showcases its reliability and efficiency, solidifying our reputation as a global expert in sludge dewatering and wastewater treatment solutions.

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