Sludge Treatment Technology

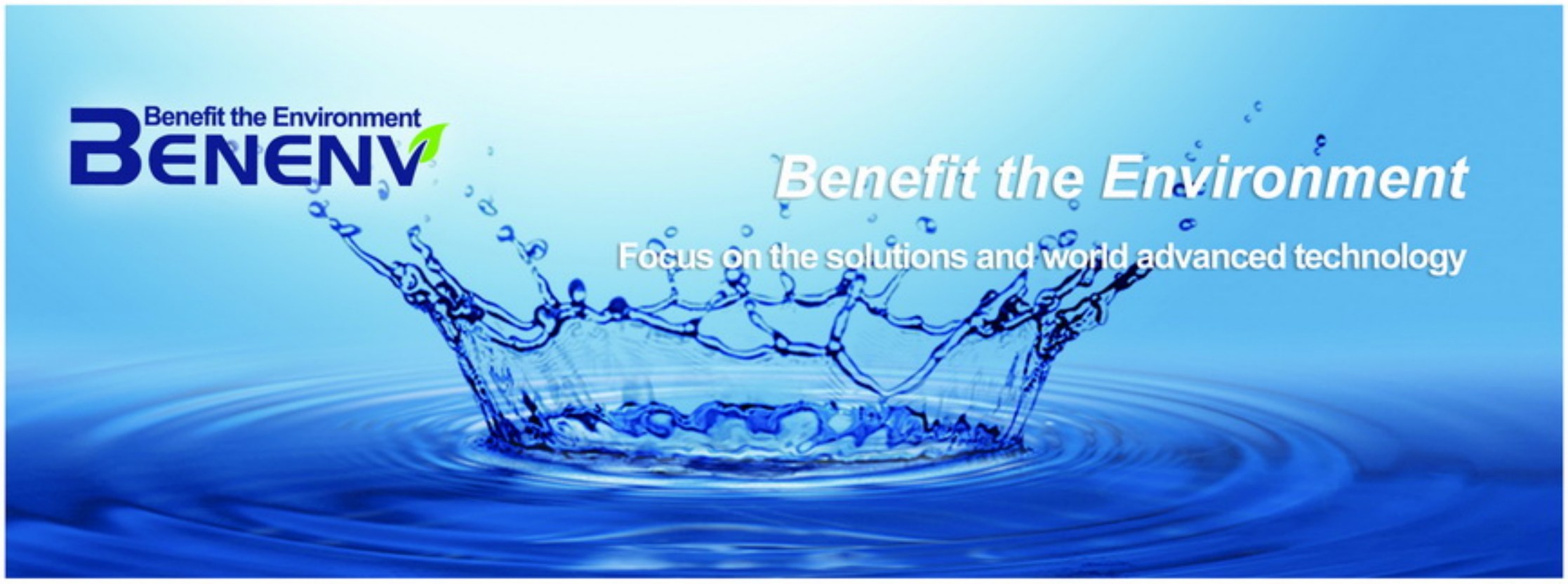
Sludge Dewatering Technology Expert

Benefit the Environment
BENENV

Sludge Treatment Solution

MDS Dewatering Press



COMPANY PROFILE

Benenv Co., Ltd. is a company with over 40 years of experience in environmental technologies with its headquarters in China, research center in Japan and overseas marketing center in the Philippines. "Benenv" is named after our mission to aid for the "Benefit the Environment", meaning to foster and promote our environmental protective technologies and equipment, ultimately contributing to a greener world.

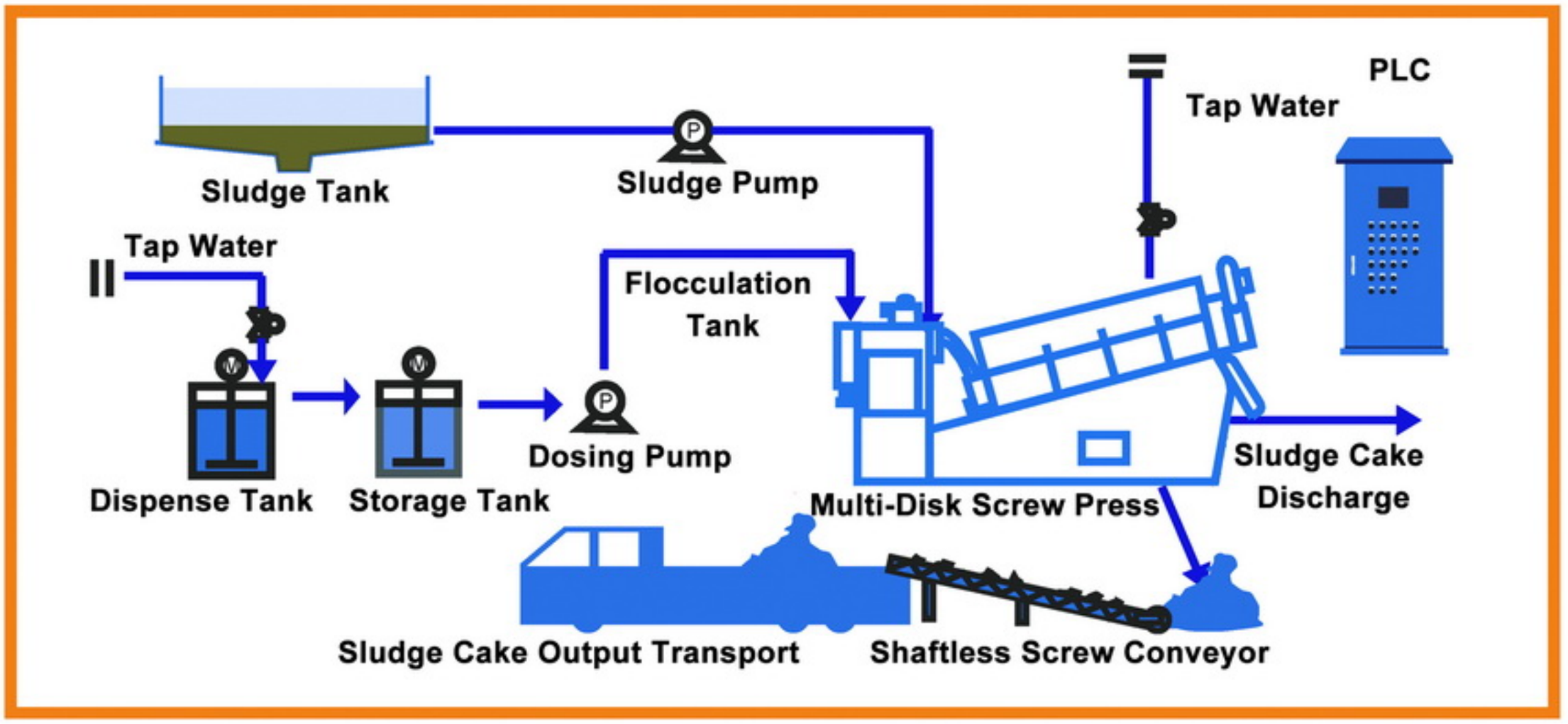
Benenv focuses on design, engineering, supply and installation of domestic and commercial water, wastewater and sewage treatment systems, and other environmental engineering. Our product lines include MDS dewatering series, KDS dewatering series, electric osmosis equipment, sludge drying machine, sludge incinerator, membrane bioreactor and other wastewater treatment equipment.

Equipped with manufacturing facility and experienced design and service team, Benenv is able to offer our customers competitive integrated sludge & wastewater treatment solutions as design, equipment supply, constructions, and technology innovation. We are highly qualified of delivering turnkey and BOT projects of hazard wastewater treatment for any industry.

Company has got international qualifications as ISO9001:2008, CE mark, etc. national awards as Utility Model Patent for MDS series, KDS series and MBR, etc., and High-tech Enterprises Qualification, etc. Our company is also working closely with top 10 universities and government organizations in China and Japan to keep our cutting-edge technology abreast with the latest technology and transform science and technology into productivity.

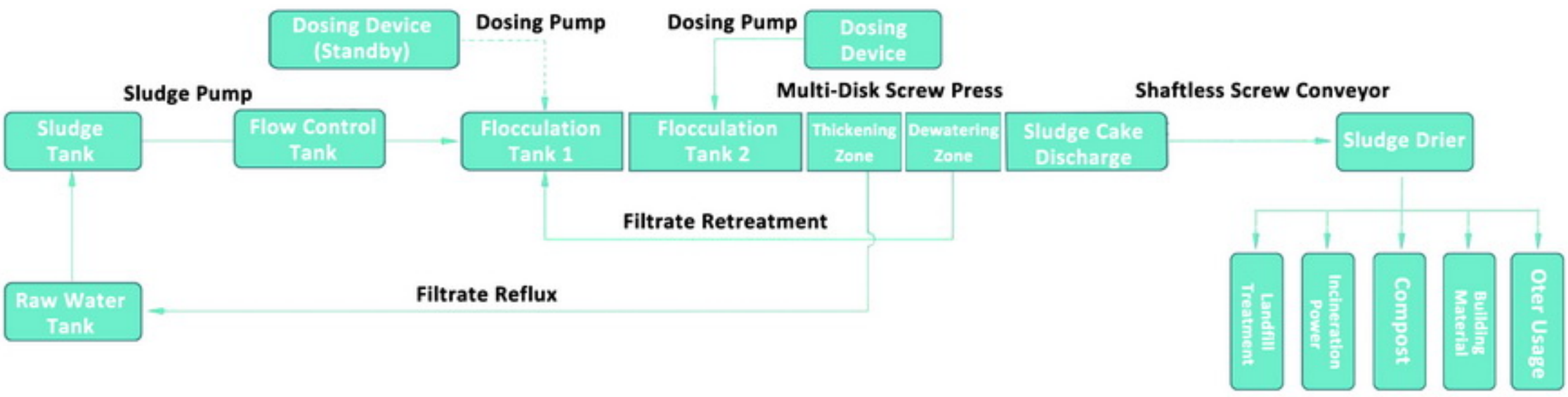
CONTENTS

Sludge Treatment Process



* Multi-disk screw press, also known as MDS dewatering press, is a kind of cutting edge sludge dewatering equipment with non-clogging design and low energy consumption, especially applicable for oily sludge.

■ *Flow Diagram*



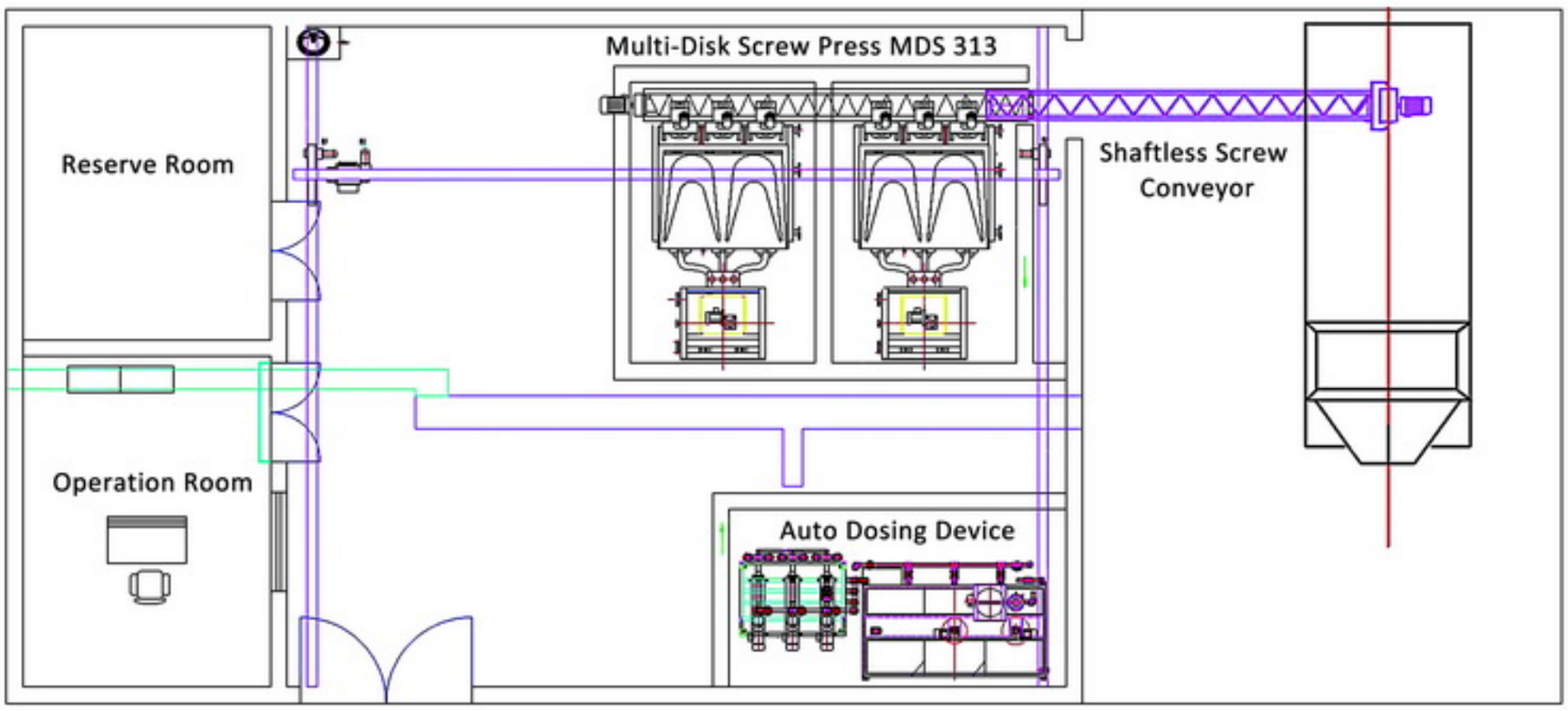
■ Process Introduction

1. Sludge is firstly fed into the Flow Control Tank and then flows down into the Flocculation Tank, where polymer coagulant is added.

2. From there, the flocculated sludge overflows into the dewatering drum where it is filtered and compressed. The entire operation sequence, including sludge feed control, polymer makeup, dosing and sludge cake discharge are controlled by the built-in timer and sensors of the PLC.

- ◎ Simple process, low system investment, highly efficient and energy-saving dewatering.
- ◎ System can be programmed to make the operation more convenient and accurate.
- ◎ Unique flocculating agent to make sludge dewatering easier.
- ◎ Uniform and accurate dispensing, saving running costs.

■ Layout of Multi-Disk Screw Press



Note：
This figure is only for reference，please ask for details while designing.

MDS Working Principle

■ *Structure Principle*

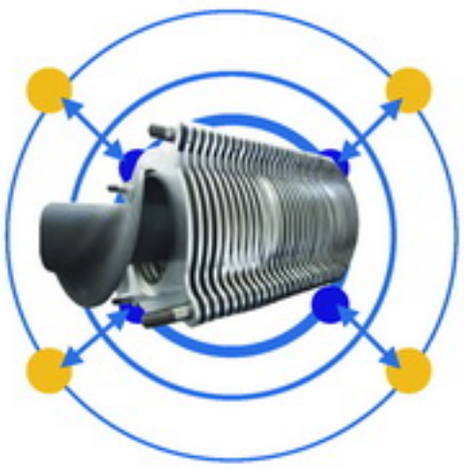
Layers of the spacers, which are Fixed and Moving Rings, are secured in place by a tie rod. The inner diameters of the Moving Rings are slightly smaller than the outer diameter of the screw and their rings. Mobilized by the screw, it continuously cleans the sludge out of the gaps, therefore, preventing clogging.

◯ *Force-water cocurrent*

Force and water are in the same direction, making the free water comes out at the *Fastest Speed*

◯ *Moderate pressure*

Maintain *Lowest energy Consumption and Mechanical wear* while ensuring the sludge dewatering effect



◯ *Thin-layer dewatering*

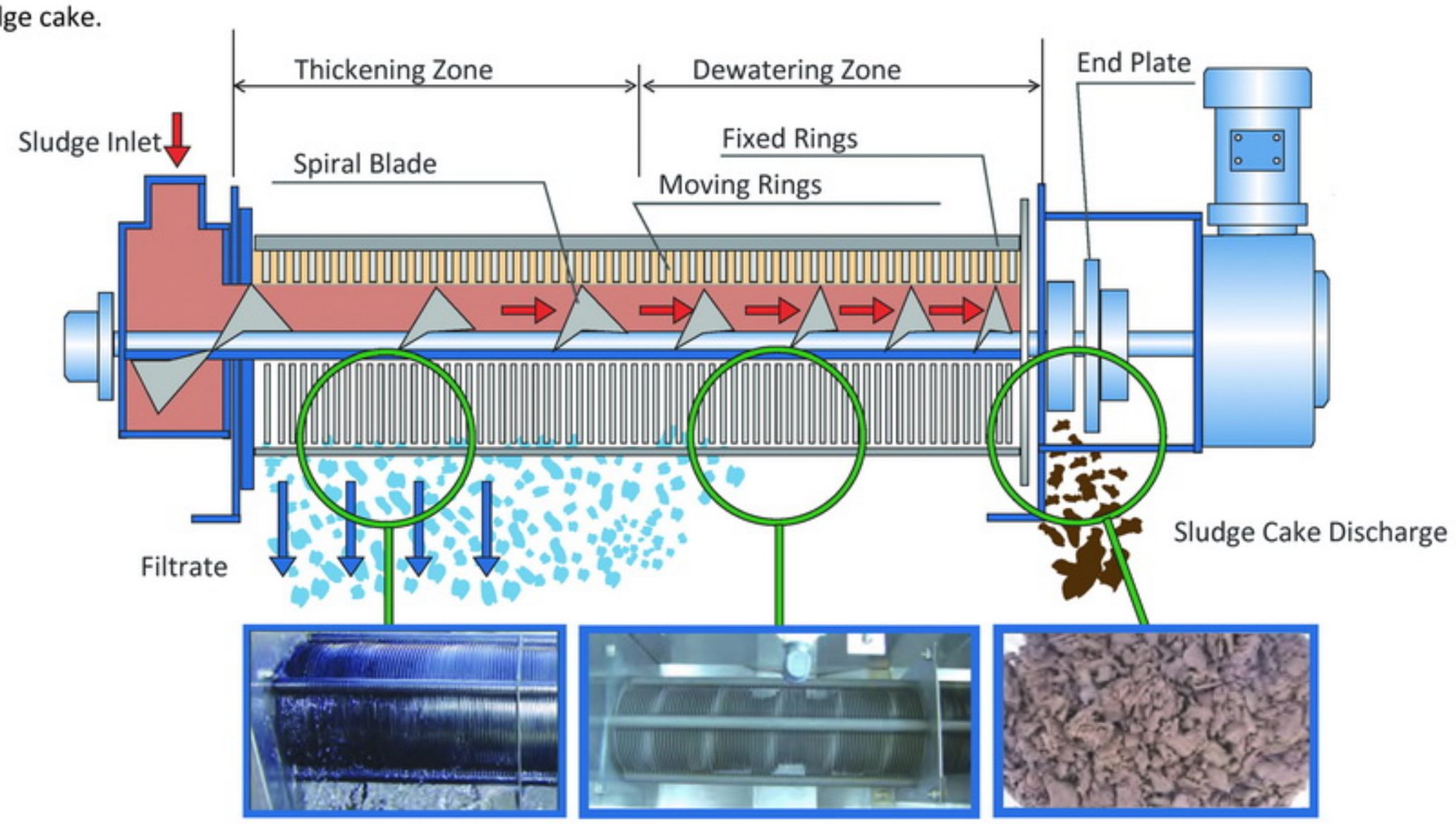
Thinning the sludge to make the free water come out by going a *Shortest Distance*

◯ *Extension of dewatering path*

Not only ensuring the *Amount of Time* during the process of sludge dewatering, but also ensuring the *Continuous Operation*

■ *Dewatering Principle*

The initial section of dewatering drum is the Thickening Zone, where the solid-liquid separating process takes place and where the filtrate will also be discharged. The pitch of the screw and the gaps between the rings decrease at the end of dewatering drum, hence increasing its internal pressure. At the end, the End Plate further increases the pressure, so as to discharge dry sludge cake.



Technical Advantages

■ *Widely Use*

- Can be widely used in municipal sewage, food, slaughtering breeding, printing and dyeing, oil chemical industry, paper making, leather, pharmaceutical and other industries of sludge dewatering;
- Exclusive pre-concentration design, applicable sludge concentration of 2000mg/L-50000mg/L;
- Due to the innovation of the structure design, it is highly suitable to various high and low concentration sludge, most especially for the oily ones.

■ *Clog-free*

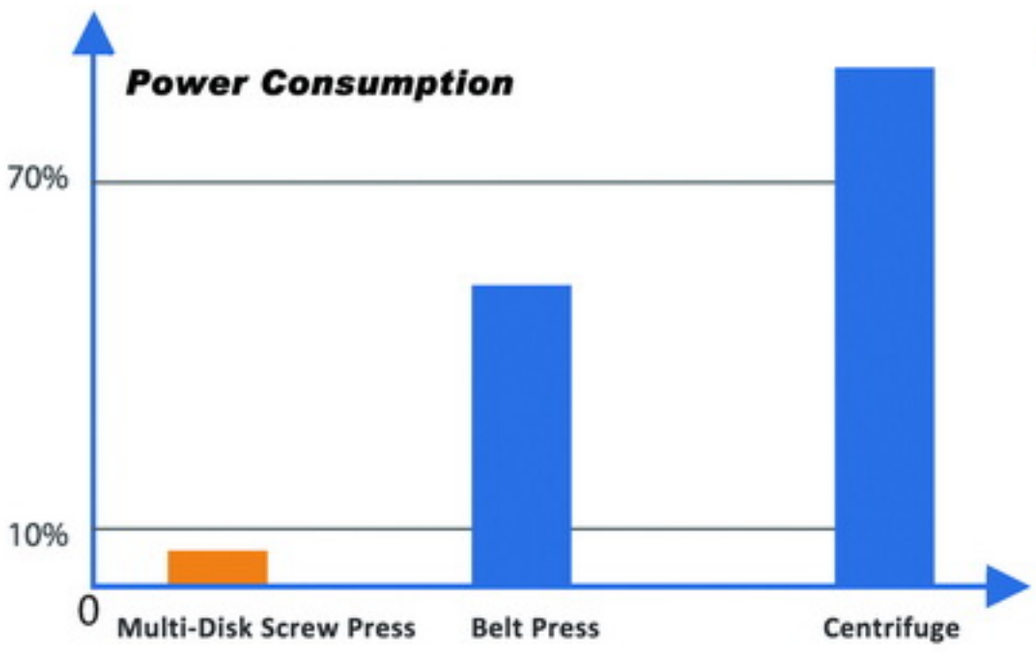
- Due to rotation of helical axis, the moving rings begin detaching from the fixed rings while continuously starting the self-cleaning process. As a result, the ubiquitous clogging is avoided. Therefore, it can handle oily sludge without any trouble while separating the water from the sludge easily. In addition, there is no need to add large quantity of flushing water and there is no odor and no secondary pollution during the dewatering process.

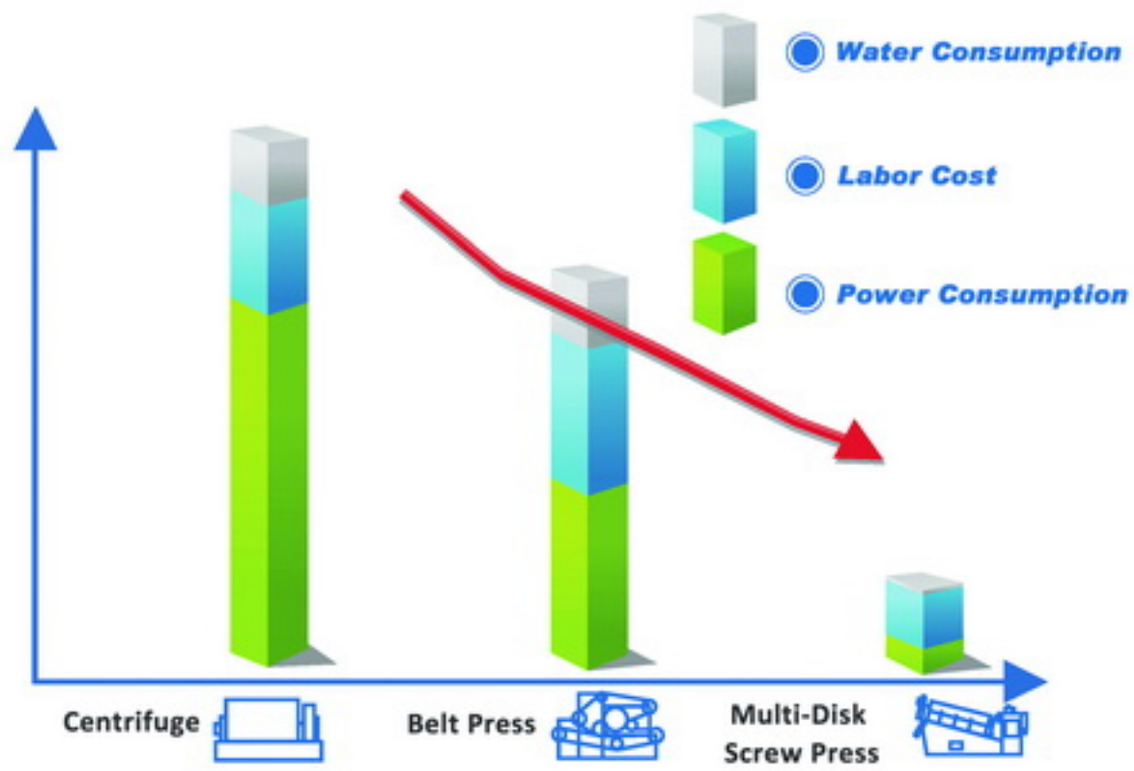
■ *Fully Automatic Control*

- There are no easily blocked pieces such as belt and filtration pore in Multi-Disk Screw Press. Combining with the auto control system, the machine runs very safely and simply and can be programmed according to the requirement of the users. It can operate automatically for 24 hours, unmanned.

■ Save Running Cost

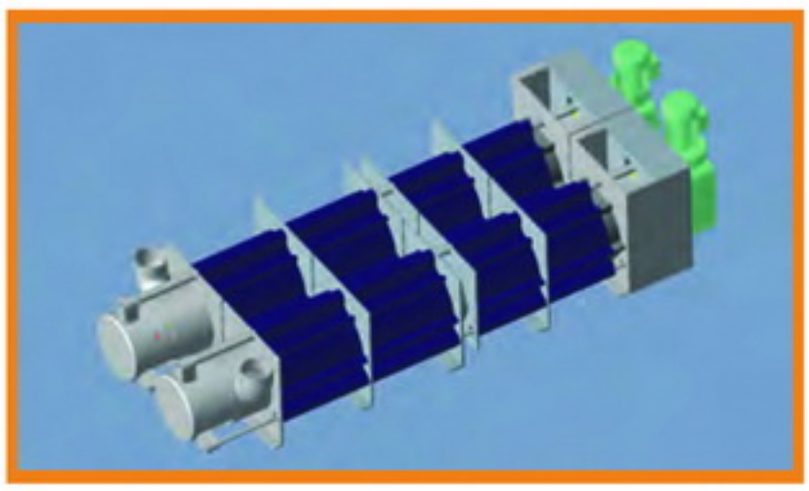
- Multi-Disk Screw Press works by the machine's internal pressure and needs no large scale integrations like rollers. It saves energy and water and has very minimal noise because of low running speed (2-4 r/min). The average unit power consumption is only 0.1-0.01kwh/kg-DS (1/8 of Belt Press and 1/20 of Centrifuge), and can greatly reduce the running cost of wastewater treatment system.





■ Contactless,Wear Free Structure Design

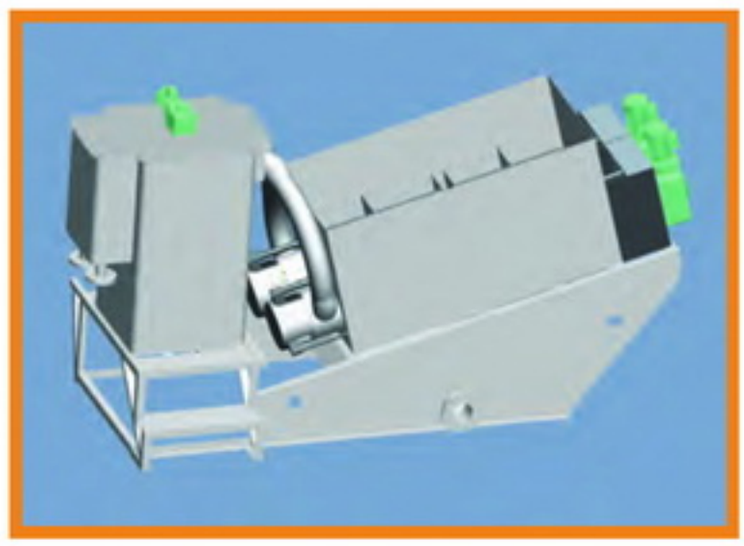
- Multi-Disk Screw Press uses the contactless wear free structure between the disks and screw shafts, thus the service life of the Screw shafts and the rings will be greatly extended. The treatment capacity of equipment and processing effects can be improved in combination with other optimization design.



◎ The contactless, wear free design between the sludge-water separation devices and shafts in the dewatering part.

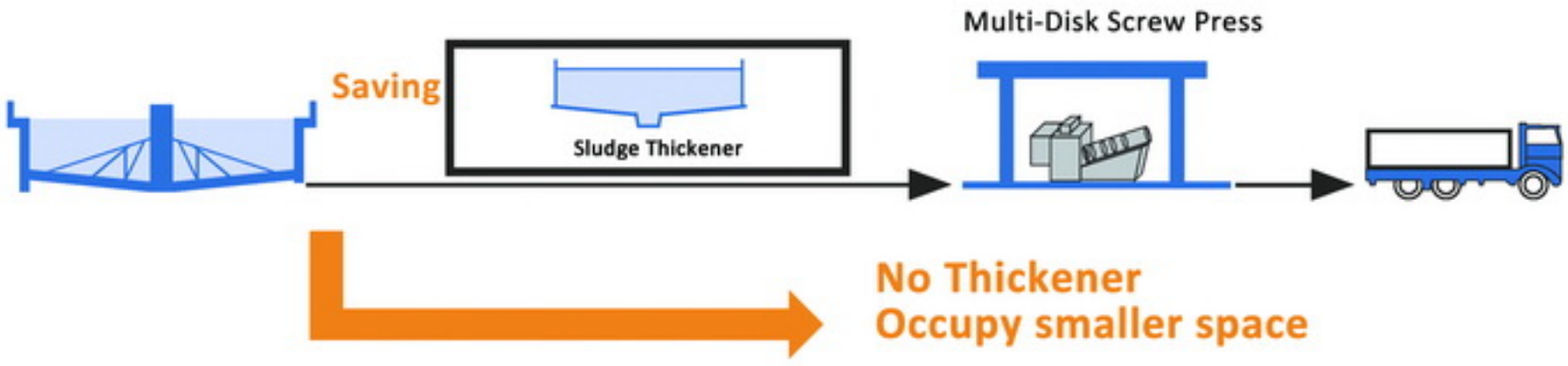
◎ Longer service life: shafts over 10 years and rings over 5 years.

◎ Wear free structural design to ensure a higher treatment capability and treatment effect.



■ Decrease Capital Investment

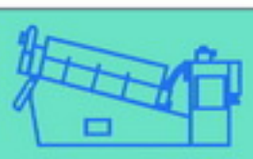
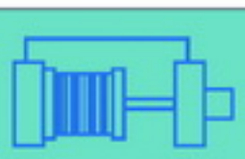
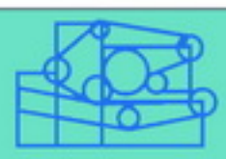
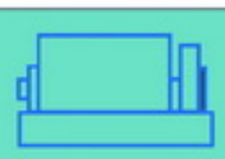
● Multi-Disk Screw Press can treat sludge in aeration tank and secondary sedimentation tank without setting sludge thickeners. Therefore, this can decrease the total investment, avoid phosphorus release from the sludge thickeners and sludge storage tanks and enhance phosphorus removal effect of the wastewater treatment system.



◎ Save construction investments on sludge thickeners and costs on mixers, air compressors, flushing pumps and other auxiliary equipment.

◎ Occupy smaller space, reducing the construction investment on dewatering room.

■ Comparison Chart

Items	 Multi-Disk Screw Press	 Frame Filter Press	 Belt Press	 Centrifuge
Dewatering of Low Concentrated Sludge	✓	×	×	×
No need Thickener	✓	×	×	×
24-hour auto-matic operation	✓	×	×	×
Occupied Space	▲	▲▲▲	▲▲▲	▲▲
Energy Consumption	▲	▲▲▲	▲▲▲	▲▲▲▲
Labor Intensity	▲	▲▲▲	▲▲	▲
Noise	▲	▲▲▲	▲▲	▲▲▲▲
Maintenance	▲	▲▲	▲▲▲	▲▲▲
Running Cost	▲	▲▲▲	▲▲▲	▲▲▲▲

Specifications & Models

■ *Models Reference*

Model ①	*Raw Wastewater Waste Activated Sludge Chemically Precipitated Sludge*		*Dissolved-air Flotation Sludge*		*Mixed Raw Sludge Aerobic Digested Sludge Sewage Sludge*
Sludge Concentration (TS)	*0.2%*	*0.5%*	*2%*	*5%*	*3%*
MDS-101	~2kg-DS/h ② (~1.0m³/h)	~3kg-DS/h (~0.3m³/h)	~5kg-DS/h (~0.25m³/h)	~10kg-DS/h (~0.2m³/h)	~13kg-DS/h (~0.43m³/h)
MDS-131	~4kg-DS/h (~2.0m³/h)	~6kg-DS/h (~0.6m³/h)	~10kg-DS/h (~0.5m³/h)	~20kg-DS/h (~0.4m³/h)	~26kg-DS/h (~0.87m³/h)
MDS-132	~8kg-DS/h (~4.0m³/h)	~12kg-DS/h (~1.2m³/h)	~20kg-DS/h (~1.0m³/h)	~40kg-DS/h (~0.8m³/h)	~52kg-DS/h (~1.73m³/h)
MDS-202	~16kg-DS/h (~8.0m³/h)	~24kg-DS/h (~2.4m³/h)	~40kg-DS/h (~2.0m³/h)	~80kg-DS/h (~1.6m³/h)	~104kg-DS/h (~3.47m³/h)
MDS-311	~20kg-DS/h (~10m³/h)	~30kg-DS/h (~3.0m³/h)	~50kg-DS/h (~2.5m³/h)	~100kg-DS/h (~2.0m³/h)	~130kg-DS/h (~4.33m³/h)
MDS-312	~40kg-DS/h (~20m³/h)	~60kg-DS/h (~6.0m³/h)	~100kg-DS/h (~5.0m³/h)	~200kg-DS/h (~4.0m³/h)	~260kg-DS/h (~8.67m³/h)
MDS-313	~60kg-DS/h (~30m³/h)	~90kg-DS/h (~9.0m³/h)	~150kg-DS/h (~7.5m³/h)	~300kg-DS/h (~6.0m³/h)	~390kg-DS/h (~13m³/h)
MDS-412	~80kg-DS/h (~40m³/h)	~120kg-DS/h (~12m³/h)	~200kg-DS/h (~10m³/h)	~400kg-DS/h (~8.0m³/h)	~520kg-DS/h (~17.3m³/h)
MDS-413	~120kg-DS/h (~60m³/h)	~180kg-DS/h (~18m³/h)	~300kg-DS/h (~15m³/h)	~600kg-DS/h (~12m³/h)	~780kg-DS/h (~26m³/h)

① Use three letters and three digits to represent the Model. The letter MDS means machine type—Multi-Disk Screw. Two former digits means the MDS cylinder diameter, the last digit shows the number of the screw shafts, such as MDS 312, it means the MDS cylinder diameter is 310mm, the number of the screw shafts is two.

② Sludge Treatment Capacity=DS Standard Capacity÷Sludge Concentration (DS stands for Dried Sludge, 0% moisture.)

* Throughput of each model is based on sludge cake with 85% water content.

* There is no certain upper limitation on inlet sludge concentration, however, the target sludge must be flowable.

* Throughput of DAF Sludge is based on sludge containing much fat, oil, and grease such as meat processing applications etc.

* Throughput of Mixed Sludge (Primary Sludge and Waste Activated Sludge) and Aerobically Digested Sludge is based on sludge containing more than 30% fiber (200 mesh) against Total Solids.

■ Specifications

Model	Screw Shaft Specifications (mm)	Sludge Cake Outlet Distance (mm)	Machine Specifications (mm)			Net Weight (kg)	Running Weight (kg)	Power (kW)	Rinsing water (L/h)
			Length	Width	Height				
MDS 101	φ100×1	215	1816	756	1040	200	290	0. 2	24
MDS 131	φ130×1	250	1969	756	1040	220	315	0. 2	24
MDS 132	φ130×2	250	2069	910	1040	305	450	0. 3	48
MDS 202	φ200×2	350	2500	935	1270	520	730	0. 8	64
MDS 311	φ310×1	495	3255	985	1600	910	1320	0. 8	40
MDS 312	φ310×2	495	3455	1295	1600	1530	2230	1. 2	80
MDS 313	φ310×3	495	3605	1690	1600	2090	3080	1. 95	120
MDS 412	φ410×2	585	4140	1550	2250	2450	3400	3. 75	144
MDS 413	φ410×3	585	4420	2100	2250	3350	4850	6. 0	216

Specifications update without notice in advance, please ask for the design drawings.

■ Running Conditions

Model	Power (kW)			Rinsing ③ Water Pressure	Maintenance Frequency	Vulnerable Part Replacement Cycle ④ (h)	
	Screw	Mixer	Total			Screw Shaft	Moving Rings
MDS 101	0. 1	0. 1	0. 2	0.1Mpa~ 0.2Mpa(No need High pressure washing device, tap water is fine.)	5min / day	10000	5000
MDS 131	0. 1	0. 1	0. 2			10000	5000
MDS 132	0. 2	0. 1	0. 3			10000	5000
MDS 202	0. 4	0. 4	0. 8			15000	7500
MDS 311	0. 4	0. 4	0. 8			30000	10000
MDS 312	0. 8	0. 4	1. 2			30000	10000
MDS 313	1. 2	0. 75	1. 95			30000	10000
MDS 412	3. 0	0. 75	3. 75			30000	10000
MDS 413	4. 5	1. 5	6. 0			30000	10000

③ Due to the dewatering body has self-cleaning function, it only needs to use atmospheric water (0.1 ~ 0.2 Mpa), rely on normally closed electromagnetic valve to spray regularly.

④ Replacement time of vulnerable part is an estimated time, in the actual operation process, the types of sludge, the means of processing, operation adjustment status and the running time of the day, will affect the replacement time.(Replacement cycle of vulnerable part is calculated as 365 days per year, 8 hours/day of running time.)

Typical Cases

Multi-Disk Screw Press can be widely used for various wastewater treatment systems such as municipal, petrochemical, chemical fiber, paper making, pharmaceutical, leather and oythr industrial water treatment system. The practical operation shows that Multi-Disk Screw Press can bring considerable economic and social benefits for users.

Project: Wastewater Treatment Project of Taizhou Zhaoyang Town

Region: Jiangsu

Model: MDS 313(2 Sets)

Wastewater Type: Municipal Wastewater

Project: Wastewater Treatment Project of Ho Chi Minh City, Vietnam

Region: Ho Chi Minh City, Vietnam

Model: MDS 312(2 Sets)

Wastewater Type: Municipal Wastewater

Project: Wastewater Treatment of Zibo Economic Development Zone

Region: Shandong

Model: MDS 313

Wastewater Type: Municipal Wastewater

Project: Jiangsu Jiangyin Haijiang Printing & Dyeing

Region: Jiangsu

Model: MDS 313

Wastewater Type: Dyeing Wastewater

Project: Hunan Taohuajiang Nuclear Power Co., Ltd of CNNC

Region: Hunan

Model: MDS 311

Wastewater Type: Domestic Sewage Wastewater

Here is a list of partial domestic and overseas cases only. Our multi-disk screw press covers almost all industries. Please send us sewage sample for chemical determining, we will provide with the most detailed report and optimal solution.

Project: The Rubber Factory of SINOPEC Qilu Branch

Region: Shandong

Model: MDS 313

Wastewater Type: Petrochemical Wastewater

Project: The Oily sludge Treatment Project of Tianjin CNOOC

Region: Tianjing

Model: MDS 311

Wastewater Type: Petrochemical Wastewater

Project: Oil Production Plant of SINOPEC

Region: Jilin

Model: MDS 312

Wastewater Type: Petrochemical Wastewater

Project: Yichang Sanxia Pharmaceutical Group

Region: Hubei

Model: MDS 202

Wastewater Type: Pharmacetical Wastewater

Project: Palm Oil Treatment Plant in Kuala Lumpur

Region: Malaysia

Model: MDS 313

Wastewater Type: Oily Wastewater

Project: Engineering Company PT. Rosean WMI in Surabaya, Indonesia

Region: Indonesia

Model: MDS 311

Wastewater Type: Chemical Wastewater

Service & Support

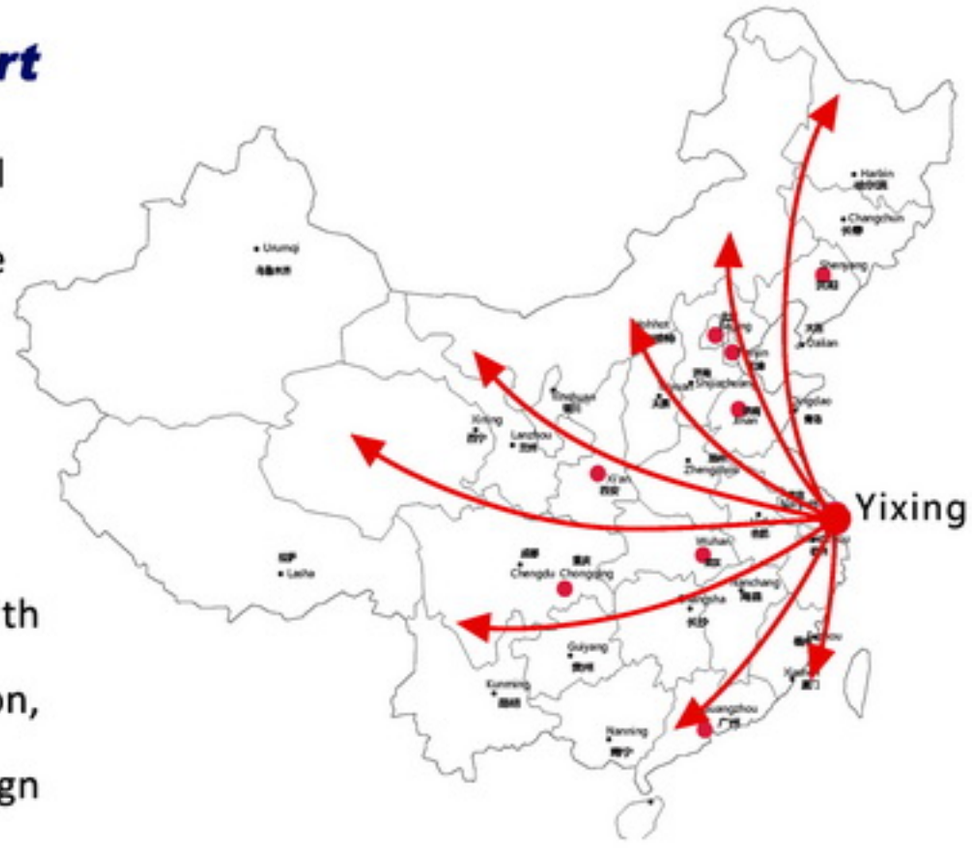
Relying on the all-around pre-sale technical support and the completed after-sale service system, BENENV can help the customers with all kinds of problems timely and effectively.

■ *All-around Pre-sale Technical Support*

Before buying the products, our sales staff and engineers will provide users all-round consulting services and help to choose the most suitable type, based on the requirements.

■ *Professional In-sale Service*

When buying the products, we can provide you with professional In-sale Service, including product selection, process optimization, sample analysis, field test and design



■ *Completed After-sale Service*

After buying our products, customers can enjoy BENENV's completed after-sale service.

- ◎ Installation and commission on-site
- ◎ Equipment operator training
- ◎ One year free warranty

■ *Global Sales Network*

Overseas Customers：

Australia，Canada，France，
Poland，USA，UK，Morocco，Turkey，
Indonesia, Malaysia, Vietnam, Russia,
Mongolia, Thailand, Ukraine, India, etc

There are more than 100 overseas cases located across the globe and in more than 20 countries.
Most cases are located in the Southeast Asian countries,
Welcome to visit us.

■ Professional Service Team

We can provide customers excellent after-sales service and technical support by a professional service team that are all high-caliber, rich theoretical and having rich practical experience.

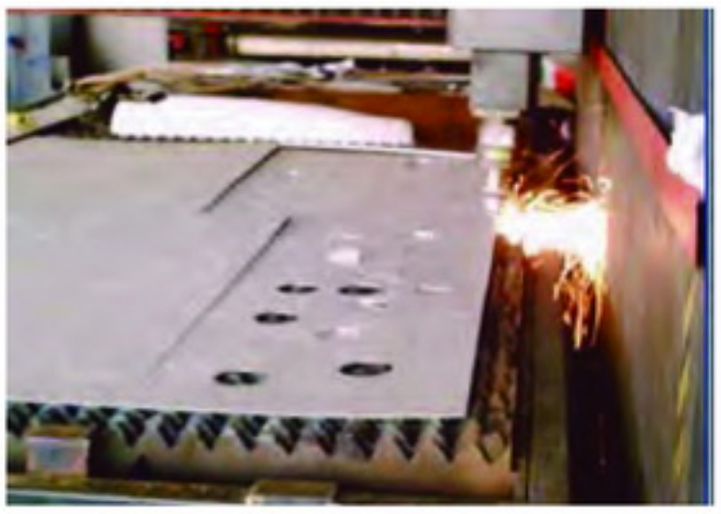
■ Quick Response System

As responding to customers' inquiries, feedbacks and questions, we will give customers a satisfactory answer or arrangements as soon as possible, solve the problems in the using process on time, ensure the machine to operate continuously and effectively.

■ Strict manufacturing Quality Control

BENENV has strong capability of technical development and manufacturing. The manufacturing department has standardized production workshop and has been equipped with various advanced mechanical processing equipment, such as large lathes, milling, bending press, cutting plate machine, laser cutting machine and argon arc welding. At present, our company has formed a completed manufacturing system including mechanical processing, welding, heating processing, assembling, inspection, etc.

Meanwhile, our company has a group of environment engineers and mechanical engineers with rich practical experience. Moreover, we have established completed process control and management system and implemented ISO 9001:2008 system. We have also passed the CE mark for MDS series products.



Product Processing

Product Inspection

Fark yaratan teknolojik yaklaşımlar...

BENENV CO.,LTD.

China headquarters: Block C, Xieqiao Industry Park, No.28 Yuedong Rd. , Yixing, China

Tel: (86)-510-80798006 *Fax: (86)-510-80798008*

Website: www.benenv.com/en/ *Email: sales@benenv.com*

Japan research center: 〒920-0276 Chateau 177B 3-35 Kanaiwahigashi 1 Chome, Kanazawa-City, Ishikawa-Pref, Japan

Tel: (81)-76-268-6667 *Fax: (81)-76-268-3338*

Website: www.benenv.co.jp *E-mail: k-kawazu@benenv.co.jp*