



**EFFECTIVE AND ECONOMICAL
SLUDGE DEWATERING**

Multi-Disc Screw Press MDQ



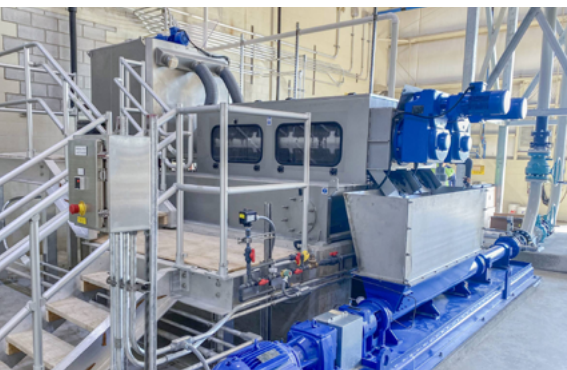
For municipal and
industrial wastewater
treatment plants



Minimal service
requirements



The highest-capacity unit
offers throughput of up to
1300 gpm (9400 lbDS/h)



MDQ Multi-Disc Screw Presses are intended for mechanical dewatering of industrial and municipal wastewater sludge

Wide range of applications

- Activated sludge;
- Primary sludge;
- Aerobically digested sludge;
- Anaerobically digested sludge;
- DAF sludge;
- Biogas plant sludge;
- Water treatment sludge;
- Agriculture sludge.

Productivity range of MDQ



for municipal WWTP sludge:
6...7150 lbDS/h and 2...1300 gpm



for industrial WWTP sludge:
6...9400 lbDS/h and 2...350 gpm

Model series range consists of 18 different models with different diameters and number of dewatering drums.



If you need assistance with model selection, please get in touch with us.

Key features of Multi-Disc Screw Press MDQ

- High operational reliability,
- Intuitive, user-friendly operation,
- High solids capture rate,
- Efficient dewatering performance,
- Low power consumption,
- Effective with complex sludge, including oily and greasy sludge.



Key Advantages of ESMIL Multi-Disc Screw Presses



Reliable and Continuous Operation

The slow-rotating screw (typically 0.5–2 rpm) and self-cleaning disc filtration system ensure stable performance without clogging, allowing uninterrupted operation with minimal operator intervention.



Simple Operation

The presses are fully automated and easy to operate. After brief training, operators can control the process, adjust parameters, and perform routine maintenance without specialized tools.



Low Energy Consumption

The innovative drum design significantly reduces power demand – typically around 380 kWh/MG, helping lower operating costs and environmental impact.



Minimal Wash Water Requirement

The continuous movement of the discs prevents clogging of the filtration gaps, minimizing flushing needs. Standard water pressure is sufficient – high-pressure cleaning is not required.



Effective for Difficult Sludge Types

Multi-disc screw presses perform particularly well when treating sludge with high fat and oil content, making them ideal for applications such as DAF sludge and food industry wastewater.



Optimized Flocculation Process

An integrated flocculation chamber ensures proper floc formation and gentle sludge transfer into the dewatering zone, preserving floc structure and improving separation efficiency.



Clean Filtrate

Most filtrate is separated in the gravity thickening zone through the disc gaps, producing a very clean filtrate stream. Optional filtrate separation allows the cleanest fraction to be discharged while returning the remainder to the flocculation tank.



Flexible Capacity Configuration

Each machine can accommodate up to six dewatering drums, enabling flexible capacity adjustment and simplified maintenance.



Compact Installation

Compared with many other dewatering technologies, multi-disc screw presses require significantly less installation space.



Robust Mechanical Design

Reinforced drum structures and high-precision disc manufacturing provide exceptional durability and reliable long-term operation.



Extended Screw Protection

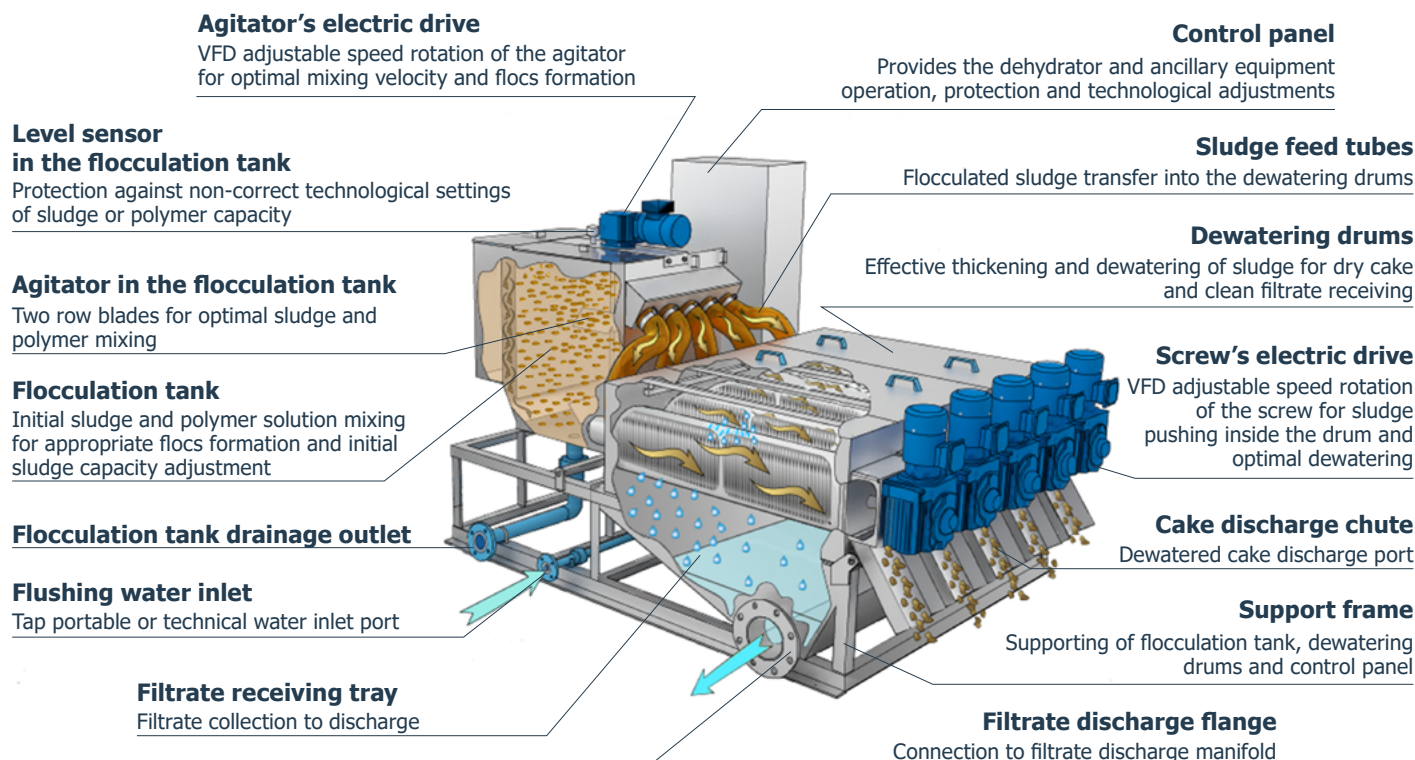
The screw blade is protected with a FREA-METAL wear strip, increasing abrasion resistance and extending service life to approximately 50,000 operating hours.



Long Equipment Lifespan

High-precision manufacturing and durable materials ensure long service life and consistent performance even in demanding operating conditions.

Multi-Disc Screw Press MDQ Design



The flocculation process significantly influences the dewatering outcome. Therefore, ESMIL multi-disc screw presses MDQ offer a variety of options for reagent treatment, such as two-stage mixing, dynamic mixer, extended flocculation, and others. An essential aspect is the operator's ability to visually monitor the flocculation process and manage it accordingly.

Productivity of MDQ/MDQ-C Multi-disc Screw Presses

Models	Maximum capacities, up to		Treatment capacity (kgDS/h) and related hydraulic capacity (m ³ /h), up to							
			Excess Biological Sludge / Chemically Precipitated Sludge				Mixed municipal sludge		Raw sludge and industrial DAF* sludge	
			0.2%		1%		3%		5%	
	lbDS/h	gpm	lbDS/h	gpm	lbDS/h	gpm	lbDS/h	gpm	lbDS/h	gpm
MDQ-101	55	9	6,5	6,5	10	2	35	2	40	1,5
MDQ-102	105	20	15	15	20	4,5	65	4,5	80	3,0
MDQ-103	160	25	20	20	35	6,5	100	6,5	120	5,0
MDQ-201	160	20	20	20	35	6,5	100	6,5	120	5,0
MDQ-202	320	45	40	40	65	15	200	15	240	10
MDQ-203	475	65	60	60	100	20	300	20	355	15
MDQ-401	1215	155	155	155	310	60	925	60	1100	45
MDQ-402	2425	310	310	310	615	125	1850	125	2205	90
MDQ-403	3640	460	465	460	925	185	2780	185	3305	130
MDQ-404	4850	615	615	615	1235	245	3705	245	4410	175
MDQ-405	6065	770	770	770	1545	310	4630	310	5510	220
MDQ-406	7275	925	925	925	1850	370	5555	370	6615	265
MDQ-501	1565	220	220	220	440	90	1190	80	1435	57
MDQ-502	3130	440	440	440	880	175	2380	160	2865	115
MDQ-503	4695	660	660	660	1320	265	3570	240	4300	170
MDQ-504	6260	880	880	880	1765	350	4760	315	5730	230
MDQ-505	7825	1100	1100	1100	2205	440	5950	395	7165	285
MDQ-506	9390	1320	1320	1320	2645	530	7145	475	8600	345

* information is based on experience of DAF-sludge dewatering with relatively high O&G concentration (40-60%) from meat processing plants (slaughter, poultry) and milk processing plants, etc.

Bigger Drum. Higher Capacity.

To meet the demand for higher sludge treatment capacity, ESMIL developed the MDQ-500 dewatering drum – the largest drum used in multi-disc screw press technology.

With a 20-inch diameter and 8’ drum length,, the enlarged drum significantly increases throughput while maintaining the reliability and gentle sludge handling typical for multi-disc presses.

MDQ-500 – THE LARGEST MULTI-DISC SCREW PRESS DRUM ON THE MARKET

This design allows treatment plants and industrial facilities to process larger sludge volumes with fewer machines, reducing installation footprint and operational complexity.

Why a Larger Drum Matters

Increasing the drum size directly improves dewatering performance:

- higher treatment capacity per unit
- fewer machines required for large plants
- reduced installation space
- simplified maintenance
- stable operation under high sludge loads

A single MDQ press can be equipped with up to six dewatering drums, enabling very high processing capacity within a compact system.



Designed for Durability

The MDQ-500 drum incorporates reinforced components to ensure reliable long-term operation:



Reinforced discs. Disc thickness in the dewatering zone increased to 3.5 mm, improving wear resistance.



FREA-METAL screw protection. A 1.5 mm ultra-durable FREA-METAL strip is welded onto the screw blade edge, significantly increasing resistance to abrasion. For highly abrasive sludge, protection can be increased to 3 mm.



Single-piece drum frame. A rigid single-piece structural frame provides enhanced strength and resistance to deformation.

MDQ Model				
	MDQ-100	MDQ-200	MDQ-400	MDQ-500
Nominal Diameter of the Dewatering Drum, in	4	8	16	20
Length of the Dewatering Drum, ft-in	2	3'-3"	6'	8'

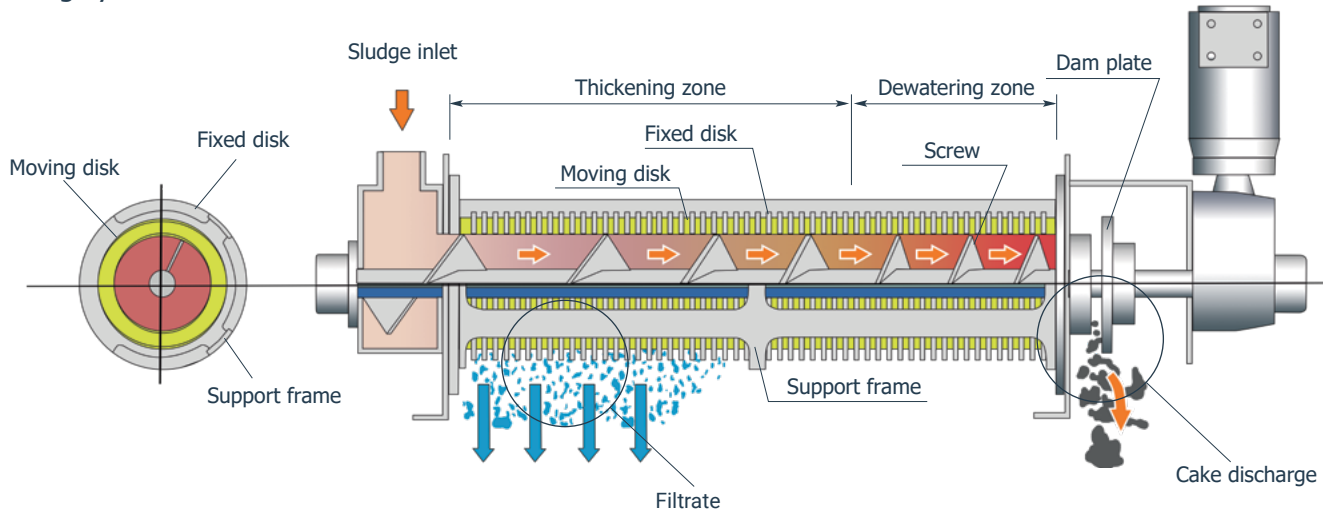
Built for High-Capacity Plants

The MDQ-500 drum is designed for large municipal and industrial facilities where maximum capacity per machine is required.

Combined with multi-drum configuration, MDQ presses deliver high performance while maintaining the advantages of low-speed, energy-efficient screw press technology.

Dewatering drum construction

The multi-disc screw press's key element is the dewatering drum with closely spaced discs. The rotating screw conveys sludge to discharge. Sludge undergoes moisture loss within the drum, and filtrate is discharged through disc gaps. Highest pressure is near discharge for compaction. The drum's slow 1-2 RPM screw uses low power (approx. 380 kWh/MG), needs minimal water, provides clean filtrate, and is highly efficient.



Thickening zone

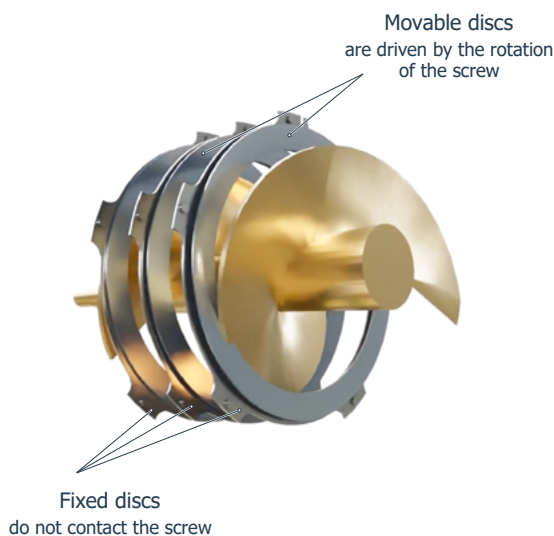
low pressure, disc gaps 0.5 mm

Intermediate zone

low pressure, disc gaps 0.35 mm

Dewatering zone

high pressure, disc gaps 0.15 mm



What Makes ESMIL-Tsurumi MDQ Screw Press Different?

NOT ALL MULTI-DISC SCREW PRESSES ARE THE SAME

Although many manufacturers use similar terminology, the design of the dewatering drum and its key components has a decisive impact on performance, reliability and service life.

ESMIL MDQ presses are engineered with a focus on structural strength, wear resistance and long-term operational stability, ensuring reliable sludge dewatering even in demanding conditions.

What Really Determines Dewatering Performance



Drum Size and Capacity

Many manufacturers emphasize model names rather than actual machine size.

In practice, the diameter and length of the dewatering drum determine the real capacity of a screw press.

ESMIL MDQ presses are designed with large drum dimensions, allowing higher throughput per unit and reducing the number of machines required for large plants.

Engineering That Makes the Difference



Reinforced Drum Frame

Unlike lightweight constructions sometimes used in the industry, the ESMIL drum is built on a rigid structural frame, providing high resistance to deformation and ensuring stable operation over many years.

Enhanced Screw Protection



The screw is one of the most critical components exposed to abrasion

ESMIL presses use FREA-METAL wear protection, welded directly onto the screw blade edge.

This protective layer significantly increases resistance to wear and extends the screw's operational life.



Precision Rings for Reliable Filtration

The filtration rings are manufactured with high precision and controlled flatness, ensuring stable filtration gaps and consistent dewatering performance.

High-quality materials and precise manufacturing eliminate deformation and premature wear.

Robust Automation System



Reliable automation ensures stable operation and protects the equipment from overload

ESMIL presses are equipped with fully integrated automation, allowing operators to control process parameters and maintain optimal dewatering performance.



Designed for Long-Term Operation

Every MDQ press incorporates over 30 years of technological development and operational experience. The result is equipment designed for:

- long service life
- stable performance in demanding sludge conditions
- minimal maintenance requirements
- reliable operation in municipal and industrial facilities.

Over 1 500 MDQ Multi-Disc Screw Presses have been installed and are operating worldwide



Applications Examples

MUNICIPAL WASTEWATER TREATMENT FACILITY

Location: Butte, MT, USA

MDQ-404 Multi-Disc Screw Press

Operational Data:

- Type of sludge: Waste activated sludge
- Flow rate per dewatering press: up to 150 GPM

The replacement of two outdated belt presses with modern MDQ multi-disc screw presses enabled the plant to achieve:

- reduced polymer consumption
- more consistent and stable dewatering performance
- lower maintenance requirements compared to previously used belt presses
- simplified operation and improved process predictability

DAIRY PLANT

Location: Poland

Containerized Dewatering Unit based on MDQ-503 Multi-Disc Screw Press with Orège SLG® Technology

This project was conducted as a pilot program to evaluate the combined performance of ESMIL and Orège technologies in industrial sludge treatment.

Operational data:

- DAF sludge: 3.2–4.2% DS
- DAF + activated sludge mix

Results:

- DAF sludge: 21.3–22.8% DS cake dryness
- DAF + activated sludge mix: 16.5–17.8% DS cake dryness

The results confirm the effectiveness of the ESMIL x Orège solution in delivering stable and measurable dewatering performance, even with varying sludge compositions - supporting improved efficiency, reduced sludge volumes, and more predictable operation in industrial applications.

CHEMICAL PLANT

Location: Charleston, NC, USA

Mobile Sludge Dewatering System based on the MDQ-503 Multi-Disc Screw Press

Faced with rising sludge disposal costs under increasing operational loads, the facility urgently needed a more efficient and cost-effective dewatering solution. A mobile ESMIL unit was quickly deployed on-site, providing immediate support and stabilizing the dewatering process under real operating conditions.

Operational data:

- Type of sludge: mixture of chemical and biologically activated sludge (approx. 8% DS)
- Required capacity: 30 GPM

Implementation results:

- Dry solids content in dewatered sludge exceeded 25% DS, reducing sludge volume and disposal costs
- Throughput of approx. 30 GPM, fully meeting process requirements
- High level of automation reduced operator involvement to basic supervision

The system was deployed under real operating conditions from day one.

Performance quickly confirmed the expected results, and after 1.5 years of successful rental operation, the customer decided to proceed with a permanent installation.

Multi-disc Screw Presses are available in different configurations to match various sludge characteristics and project requirements.

The standard MDQ series includes an integrated flocculation chamber with a VFD-controlled agitator, providing a complete dewatering solution.

For specific applications, customized versions are available, including a technological chamber with internal pumps, an additional dosing chamber, two-stage mixing, and other tailored options.

Dimensions and features of MDQ Multi-Disc Screw Presses

Model	Number × Nominal diameter of dewatering drums	Installed power, hp	Total rinsing water consumption*, gph	Preliminary dimensions (L x W x H), in	Weight dry/ in operation, lbs
MDQ-101	1×4	0.32	4.2	70 x 30 x 60	680/1120
MDQ-102	2×4	0.48	8.4	70 x 30 x 60	880/1340
MDQ-103	3×4	0.73	12.6	70 x 40 x 60	1100/1650
MDQ-201	1×8	0.58	8.7	100 x 40 x 65	1100/2200
MDQ-202	2×8	0.91	17.4	100 x 40 x 65	1320/2430
MDQ-203	3×8	1.5	26.1	100 x 50 x 65	1650/2870
MDQ-401	1×16	1.12	23.2	170 x 65 x 85	3730/5580
MDQ-402	2×16	3.0	46.4	175 x 70 x 85	6110/9550
MDQ-403	3×16	5.0	69.6	180 x 70 x 85	8910/15050
MDQ-404	4×16	7.0	92.8	190 x 90 x 90	11620/20350
MDQ-405	5×16	8.0	116.0	195 x 120 x 90	14370/23820
MDQ-406	6×16	10.0	139.2	210 x 140 x 90	16970/28930
MDQ-501	1×20	4.0	29.0	195 x 70 x 90	5180/8200
MDQ-502	2×20	8.0	58.0	210 x 75 x 90	9220/15230
MDQ-503	3×20	12.0	87.0	220 x 80 x 95	13410/22310
MDQ-504	4×20	15.0	116.0	230 x 110 x 95	17710/29420
MDQ-505	5×20	19.0	145.0	235 x 135 x 95	21760/35480
MDQ-506	6×20	23.0	174.0	240 x 160 x 95	25640/41970

* information is based on a typical cyclical rinsing once per 10 minutes for 10 seconds for each rinsing valve (from 1 to 6 valves).



Solving Sludge Challenges with Expert Dewatering Solutions

Roller Press JD



The JD Roller Press is designed for mechanical dewatering of sludge with high mineral content, including sludge containing sand, grit and other abrasive particles. It is suitable for municipal wastewater treatment plants as well as industrial, agricultural and food processing facilities.

The robust design ensures stable operation when treating difficult sludge types where conventional dewatering equipment often experiences clogging or accelerated wear. The JD press provides effective sludge volume reduction of 6-20 times, making problematic sludge easier to handle and dispose of.

Key advantages:

- Reliable dewatering without clogging or jamming
- Efficient operation across various sludge types
- Low wear even with abrasive sludge
- Simple operation and maintenance
- High operational reliability in demanding conditions.



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 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.



MDQ Multi-Disc Screw Press — Flexible Dewatering Solutions

Reliable Dewatering Where You Need It

For projects requiring flexible installation and fast deployment, the MDQ Multi-Disc Screw Press can be supplied in several configurations. The equipment is available on a skid or platform for integration into existing facilities, as well as in fully containerized units based on standard 20- or 40-foot sea containers.

This flexibility allows wastewater treatment plants and industrial facilities to implement efficient sludge dewatering solutions with minimal construction work and reduced installation time.

Designed for Flexible Installation

The modular design of MDQ systems enables easy adaptation to different plant layouts and operational requirements.

Typical applications include:

- installation in new wastewater treatment plants
- modernization of existing sludge treatment lines
- temporary or additional dewatering capacity
- industrial wastewater treatment systems
- remote or decentralized treatment facilities

Containerized Plug-and-Operate Concept

Containerized MDQ systems are delivered as fully assembled and factory-tested units. The equipment includes all key technological components required for sludge dewatering.

On-site installation is simplified and requires only basic utility connections such as:

- power supply
- sludge feed
- polymer dosing
- filtrate and cake discharge

This approach significantly reduces installation time, civil works and commissioning efforts, allowing the system to become operational within a short timeframe.

Operational Reliability

The MDQ screw press technology combines slow-speed operation, self-cleaning filtration discs and robust mechanical design, ensuring reliable performance with minimal maintenance requirements.

Mounted on a rigid skid or integrated inside a container, the system provides:

- stable long-term operation
- easy access for service and maintenance
- compact installation footprint

Scalable and Adaptable Solution

The modular concept of MDQ dewatering systems allows operators to expand capacity by adding additional units or modules when required.

This provides wastewater treatment plants with a flexible solution that can adapt to changing sludge volumes and future plant upgrades, while maintaining low operating costs and high process reliability.





About ESMIL Corp

ESMIL Corp is part of ESMIL Group, an international manufacturer of equipment and technologies for municipal and industrial wastewater treatment and sludge management, with a global portfolio of installations.

In 2016, ESMIL established a manufacturing facility in Akron, Ohio, strengthening its presence in the North American market. Today, we manufacture equipment in the USA in compliance with BABA requirements, American Steel provisions, and American Welding Society (AWS) standards.

Our core expertise includes sludge dewatering technologies such as MDQ Multi-Disc Screw Presses, JD Roller Presses, sludge thickeners, and containerized dewatering systems. The MDQ and JD series are manufactured under a licensing partnership with Tsurumi Manufacturing (Japan), combining proven Japanese technology with ESMIL's manufacturing expertise to deliver reliable performance in demanding operating conditions.

Combining manufacturing capabilities with engineering expertise and project experience, ESMIL delivers solutions tailored to the specific requirements of each application. Today, ESMIL equipment operates in municipal and industrial facilities worldwide, supporting efficient wastewater treatment and sludge management processes.



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