

ESMIL
GROUP



Multi-disc Screw Press

MDQ/MDQ-C series

Effective and economical sludge dewatering



- For municipal and industrial wastewater treatment plants;
- Minimal service requirements;
- The productivity of single unit is up to 216 m³/h (5 040 kgDM/h)

MDQ/MDQ-C Dehydrators

MDQ/MDQ-C Dehydrators 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:
3...3780 kgDS/h and 0.05...200 m³/h



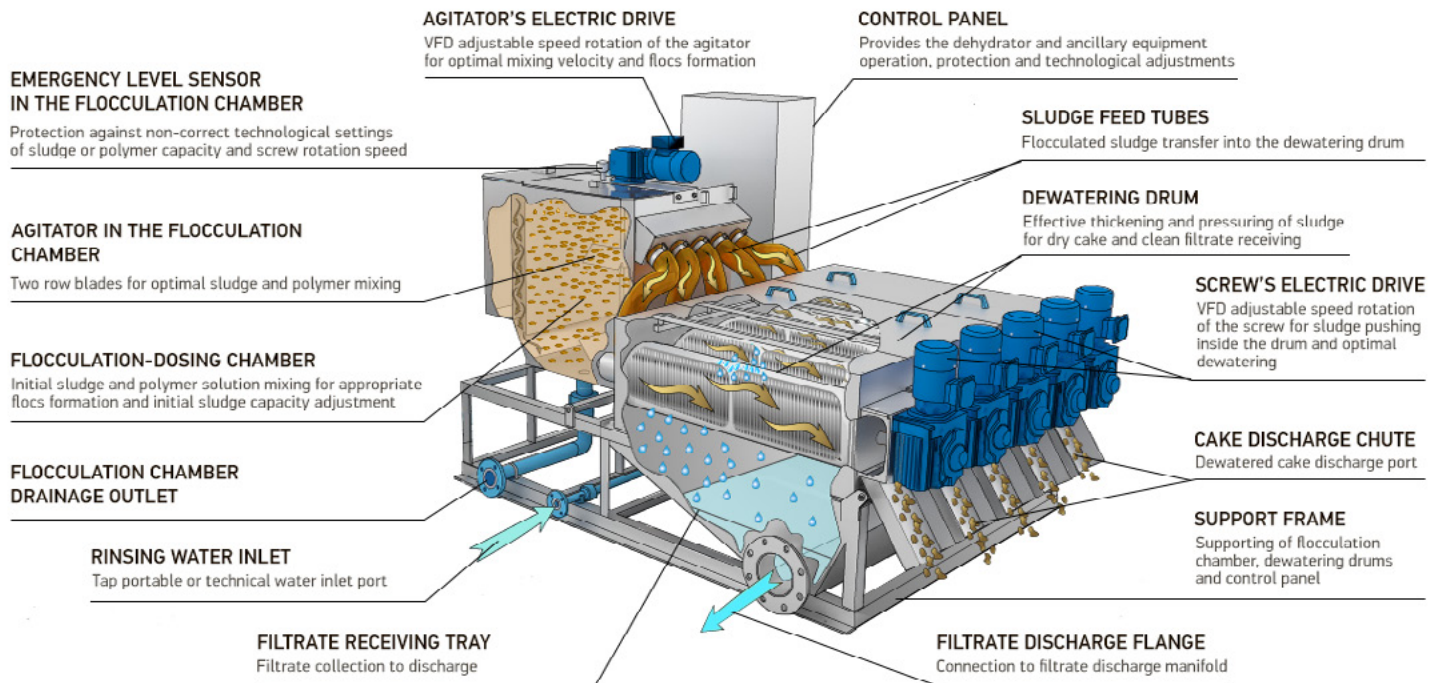
for industrial WWTP sludge:
3...5040 kgDS/h and 0.05...100 m³/h

Model series range consists of 24 different models with different diameters and number of dewatering drums.

Key features of Multi Disc Screw Press MDQ:

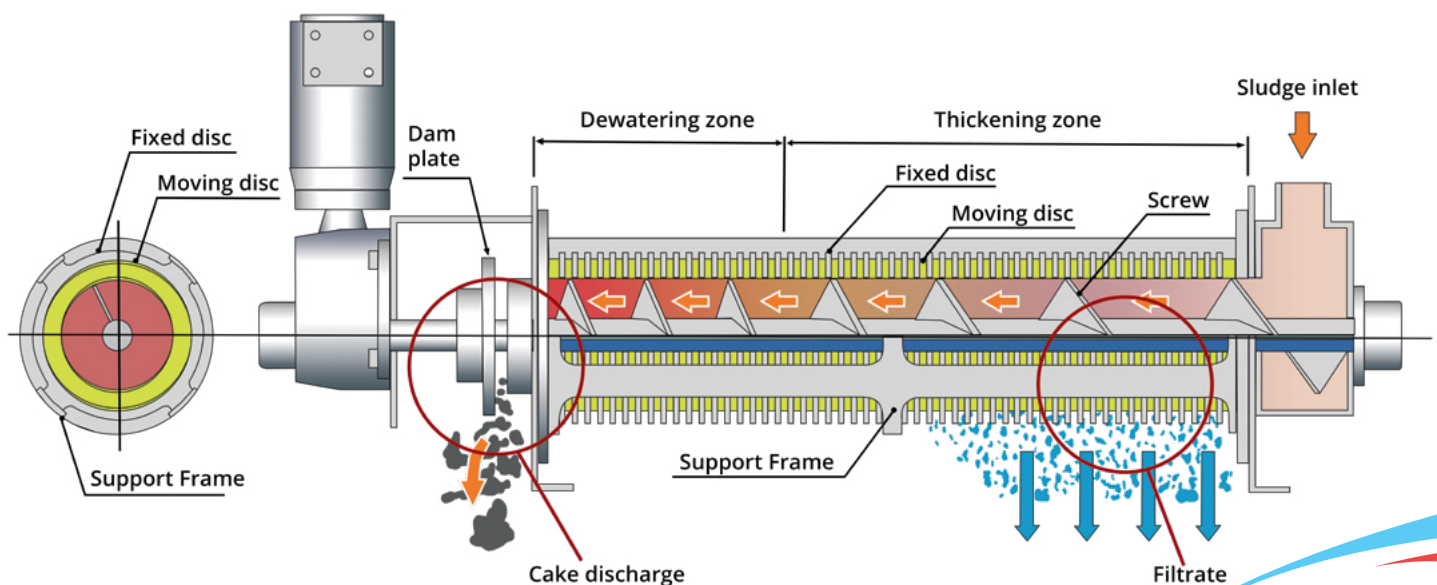
- ✓ High machine reliability,
- ✓ User-friendly operation for the operator,
- ✓ Very high solid capture rate,
- ⚙️ Efficient dewatering process,
- ⚡ Low power consumption,
- ✓ Effectiveness with complex sludge, including grease, etc.

Multi Disc Screw Press MDQ/MDC Design



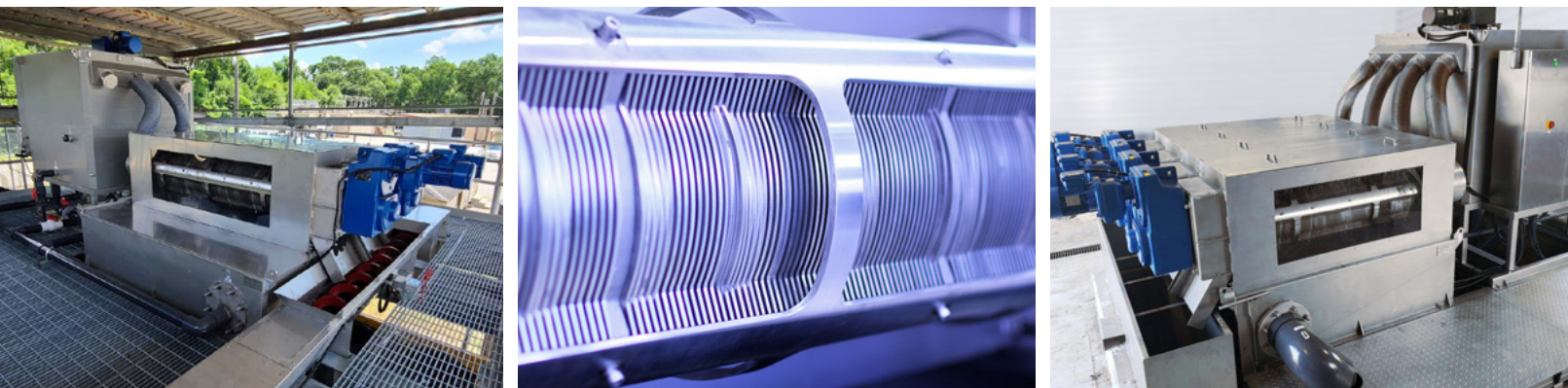
Dewatering drum construction

The multi-disk screw press's key element is the dewatering drum with closely spaced disks. The rotating screw conveys sludge to discharge. Sludge undergoes moisture loss within the drum, and filtrate is discharged through disk gaps. Highest pressure is near discharge for compaction. The drum's slow 1-2 RPM screw uses low power (0.1 kW per 1 m³ input sludge), needs minimal water, provides clean filtrate, and is highly efficient.



MDQ/MDQ-C Dehydrators

The flocculation process significantly influences the dewatering outcome. Therefore, ESMIL multi-disc 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 Press Dehydrators

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%	
	kgDS/h	m ³ /h	kgDS/h	m ³ /h	kgDS/h	m ³ /h	kgDS/h	m ³ /h	kgDS/h	m ³ /h
MDQ-101 / MDQ-101 C	24	2.0	3.0	1.5	5.0	0.5	12	0.4	18	0.36
MDQ-102 / MDQ-102 C	48	4.0	6.0	3.0	10	1.0	24	0.8	36	0.7
MDQ-103 / MDQ-103 C	72	6.0	9.0	4.5	15	1.5	18	0.6	54	1.1
MDQ-201 / MDQ-201 C	72	5.0	9.0	4.5	15	1.5	36	1.2	54	1.1
MDQ-202 / MDQ-202 C	144	10	18	9.0	30	3.0	72	2.4	108	2.2
MDQ-203 / MDQ-203 C	216	15	27	13.5	45	4.5	108	3.6	162	3.2
MDQ-351 CL	420	18	30	15	100	10	210	7.0	315	6.3
MDQ-352 CL	840	36	60	30	200	20	420	14	630	12.6
MDQ-353 CL	1 260	54	90	45	300	30	630	21	945	19
MDQ-354 CL	1 680	72	120	60	400	40	840	28	1 260	25
MDQ-355 CL	2 100	90	150	75	500	50	1 050	36	1 575	32
MDQ-356 CL	2 520	108	180	90	600	60	1 260	42	1 890	38
MDQ-451 C	840	36	60	30	200	20	420	14	630	12.6
MDQ-452 C	1 680	72	120	60	400	40	840	28	1 260	25
MDQ-453 C	2 520	108	180	90	600	60	1 260	42	1 890	38
MDQ-454 C	3 360	144	240	120	800	80	1 680	56	2 520	50
MDQ-455 C	4 200	180	300	150	1 000	100	2 100	70	3 150	63
MDQ-456 C	5 040	216	360	180	1 200	120	2 520	84	3 780	76

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

MDQ/MDQ-C Dehydrators

There are two main constructions of Multi-disc Screw Press Dehydrators that can be purchased according to sludge characteristics – model MDQ (dewatering drums are installed above the technological chamber with initial sludge feed and mixing pumps) and MDQ-C (more simple model without technological chamber and internal pumps).

Dimensions and features of MDQ/MDQ-C Multi-disc Screw Press Dehydrators

Model	Drum diameter, mm x number of drums, pcs	Nominal rinsing water consumption, l/min	Total rinsing water consumption*, l/h	Nominal pressure of rinsing water, MPa	Installed power, kW	Dimensions (L x W x H), mm	Weight dry/ in operation, kg
MDQ-101	100 x 1	16	16	0.15-0.3	0.64	1 845 x 900 x 2 015	450 / 1 050
MDQ-101 C	100 x 1	16	16		0.24	2 630 x 1 020 x 1 650	310 / 510
MDQ-102	100 x 2	32	32		0.76	1 845 x 900 x 2 015	550 / 1 200
MDQ-102 C	100 x 2	32	32		0.36	2 630 x 1 020 x 1 650	400 / 610
MDQ-103	100 x 3	48	48		1.04	1 865 x 1 100 x 2 015	650 / 1 550
MDQ-103 C	100 x 3	48	48		0.54	2 640 x 1 320 x 1 650	500 / 750
MDQ-201	200 x 1	33	33	0.2-0.35	1.08	2 670 x 1 200 x 2 025	700 / 1 600
MDQ-201 C	200 x 1	33	33		0.43	3 785 x 1 345x 2 015	500 / 1 000
MDQ-202	200 x 2	66	66		1.33	2 670 x 1 200 x 2 025	800 / 1 800
MDQ-202 C	200 x 2	66	66		0.68	3 785 x 1 345x 2 015	600 / 1 100
MDQ-203	200 x 3	99	99		1.92	2 670 x 1 500 x 2 025	1 000 / 2 350
MDQ-203 C	200 x 3	99	99		1.12	4 185 x 1 830x 2 120	750 / 1 300
MDQ-351 CL	350 x 1	88	44	0.2-0.35	1.12	5 325 x 3 430 x 2 240	1 380 / 2 320
MDQ-352 CL	350 x 2		88		2.25	4 335 x 1 505 x 2 080	2 550 / 4 400
MDQ-353 CL	350 x 3		132		3.75	4 575 x 1 830 x 2 120	3 800 / 6 500
MDQ-354 CL	350 x 4		175		5.2	4 870 x 2 290 x 2 240	5 000 / 9 200
MDQ-355 CL	350 x 5		219		5.95	5 125 x 2 930 x 2 240	5 900 / 10 500
MDQ-356 CL	350 x 6		263		7.5	5 325 x 3 430 x 2 240	7 100 / 12 700
MDQ-451 C	450 x 1	110	110	0.2-0.4	2.95	4 645 x 1 505 x 2 320	2 000 / 3 900
MDQ-452 C	450 x 2		220		5.9	4 905 x 1 775 x 2 345	3 700 / 7 000
MDQ-453 C	450 x 3		330		8.8	5 205 x 2 075 x 2 370	5 400 / 10 600
MDQ-454 C	450 x 4		440		11.0	5 405 x 2 530 x 2 370	7 100 / 13 800
MDQ-455 C	450 x 5		550		14.0	5 755 x 3 300 x 2 370	8 800 / 16 700
MDQ-456 C	450 x 6		660		17.2	5 905 x 3 885 x 2 370	10 500 / 19 700

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

The throughput mentioned above is calculated as an approximation and may vary depending on the condition of the sludge. If you need assistance with model selection, please get in touch with us.

Advantages

- **Reliability and Trouble-Free Operation**

The machine is robust and able to handle different kinds of sludge without problems. Screws rotate at a very slow speed (just 0.5 - 2 rpm typically). The dewatering drums incorporate a self-cleaning design using two specialized discs that ensure the filtration surface remains clean. This design permits uninterrupted equipment operation, eliminating the need for costly cleaning of the filter pores.

- **User-Friendly Operation for Efficient Sludge Dewatering**

Esmil dehydrators are designed for easy maintenance and operation. With just a one-day training course, any operator can proficiently manage the machine, configure its operation, and conduct any necessary servicing tasks, including machine full disassembling and reassembling. This attribute is particularly beneficial for small wastewater treatment plants with limited access to highly skilled personnel.

- **Dewatering High-Fat and High-Oil Content Sludge**

The multi-disc screw presses excels at dewatering sludge with high concentrations of fats and oils. This equipment is especially suitable for sludge containing significant amounts of fats, such as those from DAF processes. Notably, the multi-disc dehydrator is attractive to the food industry, particularly within meat processing plants where other methods like centrifugation and belt pressing may not be feasible due to greasy and abrasive content in the sludge.

- **Optimal flocculation**

The flocculation chamber is integrated into ESMIL Multi-disc press design, creating an optimal flocculation process: flocculas are formed and matured in optimal conditions and with the visual control from an operator. After the flocculated sludge is gently fed by overflowing to the dewatering drums without any pumping (and thus without flocculas disruption).

- **Clean Filtrate**

In the multi-disc press the main filtrate volume is separated from the sludge in the thickening zone with gravity and without pressing particles through the filter gaps, which creates a very clean filtrate. Additionally, as an option, the press can have a segregated filtrate collection tray, with the purest portion (typically constituting 90% of the total volume) extracted from the thickening zone, while the more contaminated portion is separately collected and returned to the flocculation tank.

- **Low Energy Consumption**

Due to its innovative drum design, featuring a slowly rotating screw, the machine consumes minimal energy - approximately 0.1 kWh per 1 m³ of initial sludge - resulting in cost savings and reduced environmental impact.

- **Minimal Wash Water Usage**

Because the movement of the discs cleans the filter gaps, and flushing is primarily employed to remove accumulated sediment from the drum body during operation, water usage is minimalized. High water pressure for flushing is unnecessary, standard pressure will suffice.

- **Convenient Operation and Maintenance**

Utilization of high-quality components and proven technical solutions guarantees equipment longevity and minimizes maintenance needs. The horizontal drum configuration enhances ease of maintenance and simplifies the replacement of wear components. Key working parts are easily accessible and serviceable using standard tools. Furthermore, the dehydrators operate with minimal noise, enhancing the convenience for maintenance personnel.

- **Multiple Drum Design**

The machine can accommodate up to six drums, allowing for the utilization of only a portion of the installed drums while keeping others in reserve for maintenance purposes.

- **Compact Footprint**

Compared to alternative dewatering equipment, multi-disc screw presses have a smaller installation footprint.

- **Enhanced Drum Strength**

Fixed discs are supported by a singular drum frame, providing enhanced structural integrity for the drum.

- **FREA-METAL Screw Protection**

A 1.5 mm strip of highly durable material (FREA-METAL) is welded onto the screw's blade edge, enhancing wear resistance. This addition prolongs the screw shaft's operational lifespan to approximately 50,000 hours of use.

- **Exceptionally Long Lifespan**

Esmil dehydrators are engineered for durability, and require minimal part replacements. The MDQ discs are meticulously crafted being cut from a single metal piece, resulting in an impressively low flatness deviation of 0.03 mm. Advanced disc flattening technology further reduces thickness deviation to 0.05 mm (as opposed to standard plate sheets of 0.25 mm), significantly prolonging the movable discs' operational life.

References

1) Industrial wastewater treatment plant SBR (Savannah, United States)

One unit is installed at an Industrial WWTP and is designed for dewatering of mixture of SBR excess sludge and DAF sludge. Inlet sludge DS concentration is 2% and outlet cake DS concentration is 19-20%.

2) Municipal wastewater treatment plant SBR (Szecseny, Hungary)

One unit is installed at a municipal WWTP and is designed for the dewatering of SBR excess sludge and primary sludge mixture. Inlet sludge DS concentration is 1.5% and outlet cake DS concentration is 19-22%. Productivity by initial sludge is 10-15 m³/h.

3) Olive oil and canned vegetable factories wastewater treatment plant (Ashdod, Israel)

One unit is installed at an industrial WWTP and is intended for the dewatering of DAF sludge from WWTP which receives sewage from food manufacturing plants. Inlet sludge DS concentration is 5-6% and outlet cake DS concentration is 23.5%.

4) Municipal wastewater treatment plant (Webster, TX, USA)

One unit is installed at a municipal WWTP and is dedicated for the dewatering of excess sludge.

5) Municipal wastewater treatment plant (Ozd, Hungary)

Two units are installed at a municipal WWTP and are dedicated for the dewatering of thickened sludge. Inlet sludge DS concentration is 2% and outlet cake concentration is 20%. Productivity by initial sludge is 6-8 m³/h.

6) Poultry factory wastewater treatment plant (Kaniv, Ukraine)

One unit is installed at a poultry factory for the dewatering of DAF sludge. Inlet sludge DS concentration is 10- 15% and outlet cake DS concentration is 44%.

More than 1500 Multi-disc Screw Press Dehydrators MDQ/MDQ-C are installed and operates all over the world



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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