



Multi-disk Screw Press

MDQ/MDQ-C series

Effective and economical sludge dewatering



- 🌿 Industrial and municipal produced and serviced in Akron, Ohio, USA;
- 🌿 Reduce sludge disposal costs by 70%;
- 🌿 Onsite pilot testing.

Multi-disk Screw Press MDQ/MDC

Multi-disk Screw Press are intended for 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...8,330 lbsDS/h and 0.22...880 gpm



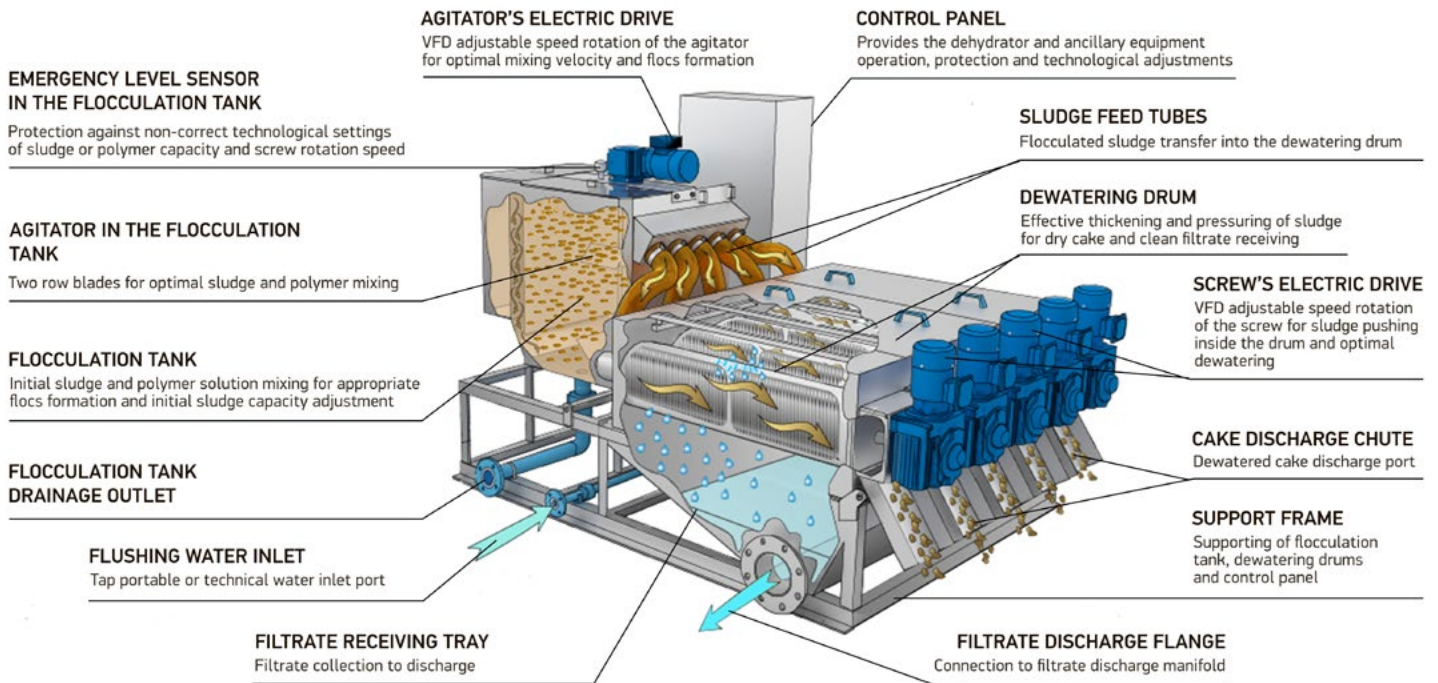
for industrial WWTP sludge:
6...11,110 lbsDS/h and 0.22...440 gpm

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

Key features of Multi Disk Screw Press MDQ:

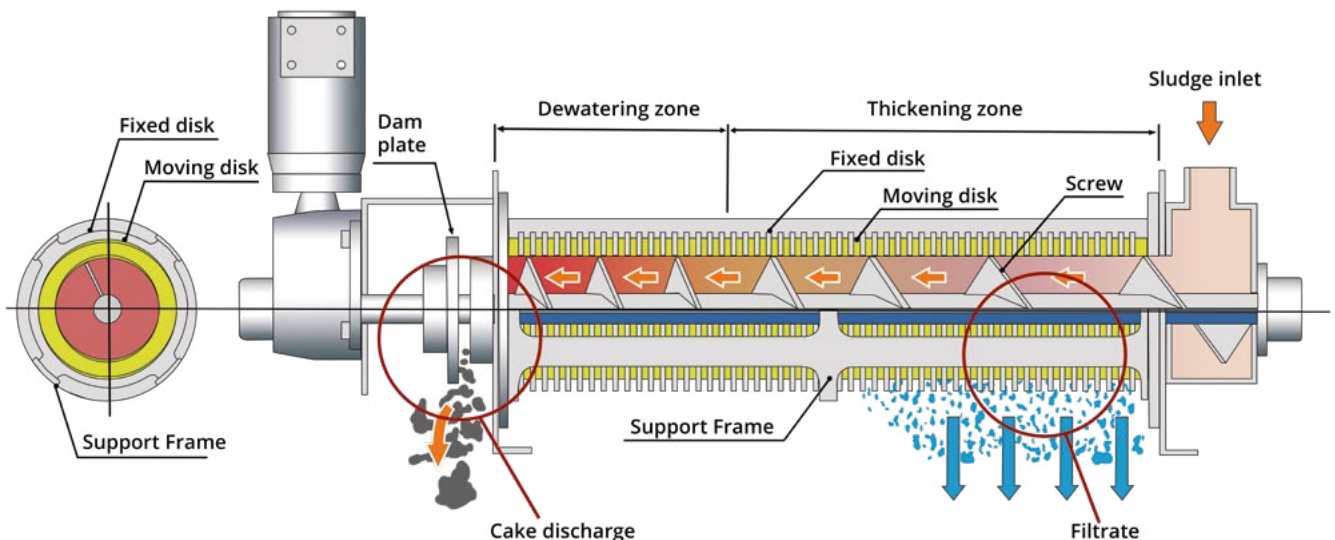
- ✓ Highly reliable,
- ✓ User-friendly operation,
- ✓ Very high solid capture rate,
- ⚙️ Efficient dewatering process,
- ⚡ Low power consumption,
- ✓ Effectiveness with complex sludge, including grease, etc.

Multi Disk Screw Press MDQ/MDC Design



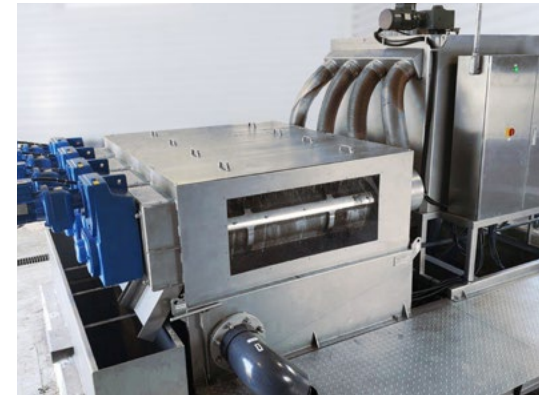
Dewatering drum design

The multi-disk screw press's key element is the dewatering drum with closely spaced disks. The rotating screw conveys sludge to discharge. Water is released in the drum, and filtrate is discharged through the gaps in the disks. Pressure is highest near discharge. The drum has a low rotation speed at 1 to 2 RPM and the process consumes minimal power will requiring minimal water producing very clean filtrate.



Multi-disk Screw Press MDQ/MDC

The flocculation process significantly influences the dewatering outcome. Therefore, ESMIL multi-disk presses MDQ offer a variety of options for chemical 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 Multi-disk Screw Press MDQ/MDC

Models	Maximum capacities, up to		Sludge of Municipal WWTP						Industrial	
			Aerobically stabilized				Anaerobic		DAF*	
	lbDS/h	gpm	1 %		3 %		7 %		5 %	
			lbDS/h	gpm	lbDS/h	gpm	lbDS/h	gpm	lbDS/h	gpm
MDQ-101 / MDQ-101 C	40	8	11	2.2	13	0.9	40	1.1	39	1.6
MDQ-102 / MDQ-102 C	80	16	22	4.4	26	1.7	80	2.3	78	3.1
MDQ-103 / MDQ-103 C	120	24	33	6.6	39	2.6	120	3.4	117	4.7
MDQ-104 / MDQ-104 C	160	32	44	8.8	52	3.5	160	4.6	156	6.2
MDQ-105 / MDQ-105 C	200	40	55	11	65	4.3	200	5.7	195	7.8
MDQ-201 / MDQ-201 C	125	15	33	6.6	40	2.7	125	3.6	120	4.8
MDQ-202 / MDQ-202 C	250	30	66	13.2	80	5.3	250	7.1	240	9.6
MDQ-203 / MDQ-203 C	375	45	99	19.8	120	8	375	10.7	360	14.4
MDQ-204 / MDQ-204 C	500	60	132	26.3	160	10.6	500	14.3	480	19.2
MDQ-205 / MDQ-205 C	625	75	165	32.9	200	13.3	625	17.8	600	24
MDQ-401 C	600	54	150	30	180	12	565	16	540	22
MDQ-402 C	1,200	108	300	60	360	24	1,130	32	1,080	43
MDQ-403 C	1,800	162	450	90	540	36	1,695	48	1,620	65
MDQ-404 C	2,400	216	600	120	720	48	2,260	64	2,160	86
MDQ-405 C	3,000	270	750	150	900	60	2,825	81	2,700	108
MDQ-406 C	3,600	324	900	180	1,080	72	3,390	97	3,240	129
MDQ-401 CL	700	65	183	37	220	15	695	20	660	26
MDQ-402 CL	1,400	130	366	73	440	29	1,390	40	1,320	53
MDQ-403 CL	2,100	200	549	110	660	44	2,085	59	1,980	79
MDQ-404 CL	2,800	265	732	146	880	59	2,780	79	2,640	105
MDQ-405 CL	3,500	330	915	183	1,100	73	3,475	99	3,300	132
MDQ-406 CL	4,200	400	1,098	219	1,320	88	4,170	119	3,960	158
MDQ-501 C	1,400	130	367	73	440	29	1,390	40	1,320	53
MDQ-502 C	2,800	260	734	147	880	59	2,780	79	2,640	105
MDQ-503 C	4,200	390	1,101	220	1,320	88	4,170	119	3,960	158
MDQ-504 C	5,600	520	1,468	293	1,760	117	5,560	159	5,280	211
MDQ-505 C	7,000	650	1,835	366	2,200	146	6,950	198	6,600	263
MDQ-506 C	8,400	780	2,202	440	2,640	176	8,340	238	7,920	316

*- 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.

The multi-disk screw press is available in two designs and is specified according to different sludge characteristics. The MDQ model incorporates a technological chamber or equalization tank with a sludge pump and mixing chamber. The MDQ-C model, a simpler design, does not include the technological chamber.

Dimensions and features of Multi-disk Screw Press MDQ/MDC

Model	Drum diameter, in x number of drums, pcs.	Nominal rinsing water consumption, gpm	Total rinsing water consumption*, gph	Nominal rinsing water pressure, psi	Installed power, Hp	Dimensions (L x W x H), in	Weight dry/ in operation, lb
MDQ-101	4 x 1	4.2	4.2	22 - 44	0.99	73 x 35 x 79	1,000 / 2,310
MDQ-101 C					0.32	75 x 32 x 57	680 / 1,120
MDQ-102	4 x 2	8.4	8.4		1.15	73 x 35 x 79	1,210 / 2,650
MDQ-102 C					0.48	75 x 32 x 57	880 / 1,350
MDQ-103	4 x 3	12.6	12.6		1.4	74 x 43 x 79	1,430 / 3,420
MDQ-103 C					0.73	76 x 40 x 57	1,100 / 1,650
MDQ-104	4 x 4	8.4	16.8		1.76	83 x 59 x 80	1,990 / 4,300
MDQ-104 C					0.89	84 x 56 x 57	1,430 / 2,200
MDQ-105	4 x 5	12.6	21		1.92	83 x 59 x 80	2,200 / 4,630
MDQ-105 C					1.05	84 x 56 x 57	1,650 / 2,540
MDQ-201	8 x 1	8.7	8.7	30 - 50	1.45	104 x 47 x 80	1,540 / 3,530
MDQ-201 C					0.58	104 x 40 x 65	1,100 / 2,200
MDQ-202	8 x 2	17.4	17.4		1.78	104 x 47 x 80	1,770 / 3,970
MDQ-202 C					0.91	104 x 40 x 65	1,320 / 2,430
MDQ-203	8 x 3	26.1	26.1		2.57	105 x 59 x 80	2,200 / 5,180
MDQ-203 C					1.5	104 x 52 x 65	1,650 / 2,870
MDQ-204	8 x 4	17.4	34.8		3.38	111 x 83 x 83	2,670 / 6,950
MDQ-204 C					1.84	110 x 75 x 65	2,200 / 3,310
MDQ-205	8 x 5	26.1	43.5		3.71	111 x 83 x 83	3,000 / 7,520
MDQ-205 C					2.18	110 x 75 x 65	2,430 / 3,530
MDQ-401 C	14 x 1	17.4	17.4	1.5	149 x 54 x 79	2,800 / 4,520	
MDQ-402 C	14 x 2		34.8	3.0	156 x 59 x 82	5,020 / 8,380	
MDQ-403 C	14 x 3		52.2	5.0	165 x 72 x 83	7,450 / 12,460	
MDQ-404 C	14 x 4		69.6	7.0	177 x 90 x 88	9,700 / 17,640	
MDQ-405 C	14 x 5		87.0	8.0	186 x 115 x 88	11,680 / 20,720	
MDQ-406 C	14 x 6		104.4	10.0	194 x 135 x 88	13,000 / 23,150	
MDQ-401 CL	14 x 1	23.2	23.2	1.5	164 x 53 x 79	3,040 / 5,110	
MDQ-402 CL	14 x 2		46.4	3.0	171 x 59 x 82	5,620 / 9,700	
MDQ-403 CL	14 x 3		69.6	5.0	180 x 72 x 83	8,380 / 14,330	
MDQ-404 CL	14 x 4		92.8	7.0	202 x 90 x 88	11,020 / 20,280	
MDQ-405 CL	14 x 5		116.0	8.0	202 x 115 x 88	13,670 / 24,700	
MDQ-406 CL	14 x 6		139.2	10.0	210 x 135 x 88	15,650 / 28,000	
MDQ-501 C	18 x 1	29	29.0	4.0	183 x 59 x 91	4,410 / 8,600	
MDQ-502 C	18 x 2		58.0	9.0	193 x 70 x 92	8,160 / 15,430	
MDQ-503 C	18 x 3		87.0	12.0	205 x 82 x 93	11,900 / 23,370	
MDQ-504 C	18 x 4		116.0	15.0	213 x 100 x 93	15,640 / 30,420	
MDQ-505 C	18 x 5		145.0	19.0	227 x 130 x 93	19,400 / 36,810	
MDQ-506 C	18 x 6		174.0	23.0	232 x 153 x 93	23,150 / 43,430	

*- 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 sludge characteristics. Contact Esmil for model selection assistance.

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 disks 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 screw presses 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-disk screw press 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-disk screw press 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's Multi-disk 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-disk 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 0.0004 kWh per 1 gal of initial sludge - resulting in cost savings and reduced environmental impact.

- **Minimal Wash Water Usage**

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

- **Convenient Operation and Maintenance**

The presses high quality components and proven technology assures equipment longevity and minimizes maintenance. 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-disk screw presses have a smaller installation footprint.

- **Enhanced Drum Strength**

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

- **FREA-METAL Screw Protection**

A 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 screw presses are engineered for durability, and require minimal part replacements. The MDQ disks are meticulously crafted being cut from a single metal piece, resulting in an impressively low flatness deviation of 0.001 in. Advanced disk flattening technology further reduces thickness deviation to 0.002 in (as opposed to standard plate sheets of 0.01 in), significantly prolonging the movable disks' operational life.

References

1) Industrial wastewater treatment plant (Savannah, GA, USA)

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

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

One unit is installed at this municipal WWTP and is designed for dewatering aerobically stabilized excess sludge. Inlet sludge DS concentration is 1.3-1.5% and outlet cake DS concentration is 18%. Initial sludge productivity is up to 120 gpm.

3) Municipal wastewater treatment plant (Argentia, Newfoundland, Canada)

One unit is installed at this municipal WWTP as a part of a containerized wastewater treatment system and is designed for dewatering MBR excess sludge. Inlet sludge DS concentration is 0.5-1.0% and outlet cake DS concentration is 15-17%.

4) Municipal wastewater treatment plant (Bridge City, TX, USA)

One unit is installed at this municipal WWTP and is designed for dewatering aerobically digested excess sludge. Inlet sludge DS concentration is 3.5% and outlet cake DS concentration is 22-23%.

5) Industrial wastewater treatment plant (Sugar creek, OH, USA)

One unit is installed at the industrial WWTP treating wastewater from the cheese factory. The unit is designed for dewatering aerobically stabilized MBR sludge. Inlet sludge DS concentration is 2% and outlet cake DS concentration is 18-20%.

6) Industrial wastewater treatment plant (Verona, VA, USA)

One unit is installed at the industrial WWTP treating dairy wastewater. The unit is designed for dewatering DAF sludge. Inlet sludge DS concentration is 4% and outlet cake DS concentration is 19%.

More than 1500 Multi-disk Screw Press MDQ/MDC are installed and operate around the world



ESMIL Group



ESMIL Corp, a proud member of the Esmil Group, stands as a distinguished leader in the field of wastewater treatment equipment production. We specialize in the design and delivery of top-quality equipment, serving both municipal wastewater treatment and various industries such as food processing, cement, chemicals, coal, and metals.

The Esmil Group offers a wide-ranging product portfolio, comprising over 45 types of mechanical treatment, biological treatment, and sludge dewatering equipment. Our primary focus is on providing reliable and efficient solutions that consistently meet the highest industry standards.

In 2016, Esmil expanded its presence in North America with the establishment of a state-of-the-art manufacturing facility in Akron, Ohio. This strategic localization enables us to meet our clients' needs with high-quality equipment. Today, we proudly manufacture in the USA, adhering to rigorous industry standards, and comply with the BABA program policy, American Steel policy, and American Welding Society standards.

Our core expertise in the USA lies in sludge dewatering solutions for various industries. We offer a comprehensive range, including Multi-disk Screw Presses (MDQ/MDC series), JD Roller Press, Sludge Thickeners, and containerized sludge dewatering systems.

At present, ESMIL Group stands as an established company that seamlessly combines production capabilities with high-quality standards and engineering prowess in the development of equipment tailored to meet customer-specific needs. Our company thrives by manufacturing equipment for complex projects dedicated to safeguarding water resources, promoting urban ecological balance and advancing zero-waste production practices. Esmil has firmly established itself as a trusted partner among the world's leading engineers and EPC companies.



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