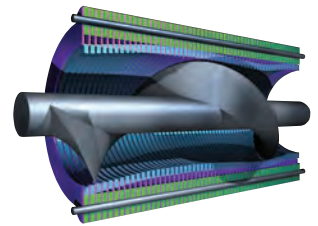
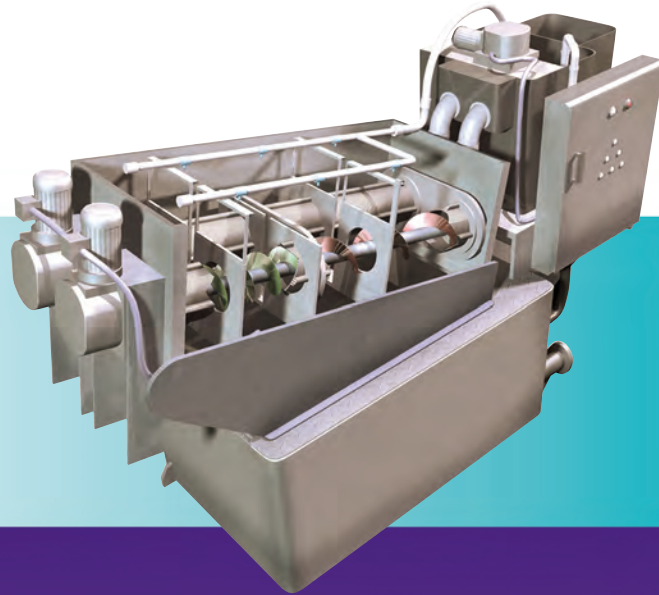


Volute Dewatering Press

**Innovative sludge dewatering technology
offering many advantages over conventional
sludge management methods**



Volute Dewatering Press

CONCEPT

The PWTech™ Volute Dewatering Press is a unique product, originally developed in Japan, that offers many advantages over current sludge management practices. Patented worldwide, the Volute Dewatering Press is presently used in over 850 installations.

The key to the process is the “dewatering drum.” This drum can achieve both thickening and pressing (dewatering) of the sludge in a single, compact operation. Thus the Volute Dewatering Press can take sludge as dilute as 0.1% solids directly from a treatment process, such as an oxidation ditch or clarifier, and produce a cake of over 20% solids. Separate thickening, storage, and conditioning processes are eliminated. In addition, the need for operators, continuous use of wash water, and high power consumption are eliminated.

UNIQUE DEWATERING DRUM DESIGN

Screw presses are a neat, simple way of conveying and dewatering sludge. They typically have a single bearing or bushing at one end and a gear drive at the other end—simple, robust, and low maintenance. However, the screws for dewatering typically have a casing with openings in it to allow fluid to escape from the sludge as it is pressed. If these openings are too small, they constantly plug with solids, preventing fluid from leaving the sludge. Therefore, the openings are usually fairly large, which means that the sludge cannot be pressed

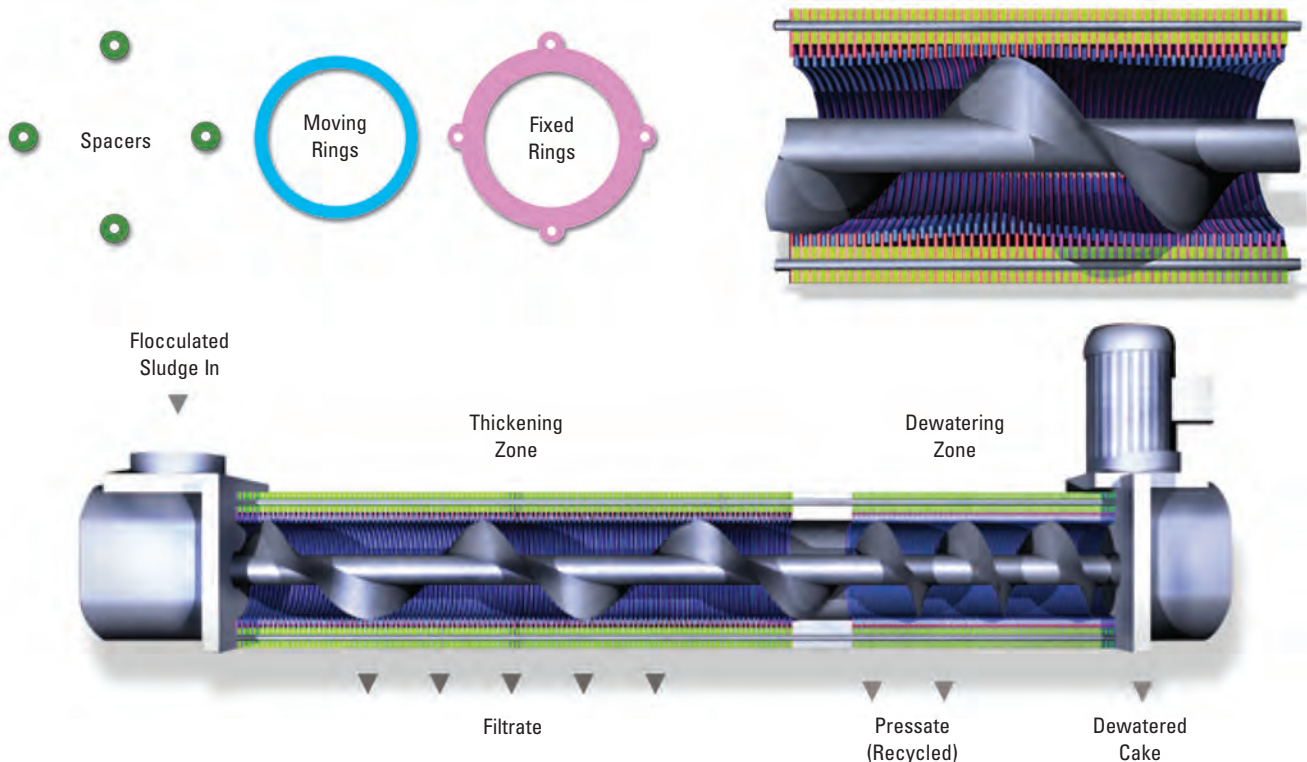
too much as it will extrude through the openings. The result is that screw presses generally do not achieve good cake solids.

Unlike traditional screw presses, the Volute Dewatering Press features the unique “dewatering drum.” Spacers and fixed rings are held in place on tie rods. Moving rings, slightly smaller than the outer diameter of the screw and slightly narrower than the spacers, are located between the fixed rings and are moved by the screw. The constant movement of the moving rings cleans the fine gaps between the moving and fixed rings, preventing clogging. The moving rings also cut into the sludge cake, allowing additional surface area for the release of moisture.

The initial section of the dewatering drum is the thickening zone. The filtrate is discharged here. The pitch of the screw narrows and the gaps between the rings decrease towards the end-plate where solids are discharged. Pressing of the sludge occurs here.

PROCESS DESCRIPTION

Sludge is fed into a mixing tank where polymer is thoroughly mixed in. The sludge then passes through a flocculation tank where gentle mixing and flocculation occurs. From there, the sludge overflows into the dewatering drum and is pressed. The entire operation is controlled by the Volute Dewatering Press control panel.



THE VOLUTE SYSTEM

The Volute Dewatering Press is designed to be a fully automated system capable of starting up, operating, and shutting down with no operator intervention. This is possible because the control panel is designed to control the automated polymer feed system, the unit sludge feed pump, and any conveyors required to remove dewatered cake, all in addition to the Volute Dewatering Press itself. Thus, all components of the dewatering system work together, automatically starting up, operating, and shutting down as required.

PWTech can provide complete systems or work with other suppliers to provide an integrated package. In addition, unit operating and alarm outputs for connection to plant PLC/SCADA systems are standard.

ADVANTAGES

- No need for thickeners, sludge storage, or separate dosing facilities
- No need for regular operator attendance
- Produces high-quality filtrate, does not need to return to the head works (i.e. high solids recovery)
- Extremely low power consumption—up to 95% less than many other dewatering processes
- Low noise and odor generation
- Low wash water consumption
- Able to handle oily sludges



Model KD-202 Volute Dewatering Press, above, (capacity up to 150 pounds per hour dry solids) is available for pilot studies. Interested parties who would like to see the unit in operation or who have a site available for pilot studies should contact PWTech.

- Flexible—can deal with feed sludges from <0.2% to >4%
- Rapid installation

OPERATION AND MAINTENANCE

The Volute Dewatering Press requires very little operator attention, other than periodic inspection and chemical replenishment. As a fully automated process, it controls the operation of wasting sludge directly from the biological process or clarifier, chemical make-up and dosing, flocculation, and then dewatering. Depending on operating conditions, a partial overhaul of the dewatering drums may be required every three years. This two-hour operation is undertaken in the field, with minimal disruption to plant operation.

Results Achieved with the Volute Dewatering Press

Sludge Type	Feed Solids (%)	Cake Solids (%)	Solids Recovery (%)	Polymer Use (lb/dry ton of solids)
Municipal & Biological				
Waste Sludge	0.2-1.5	17-25	98	10-22
Digested/Thickened	1.5-6	16-28	97	10-16
Primary	1-4	25-40	95	6-12
Potable				
Ferric Sludge	5-10	35-45	95	5-10
Alum Sludge	1-2.5	20-30	95	4-8
Lime Slurry	2	25-38	97	4-10



An example of the solids generated by the Volute Dewatering Press.

APPLICATIONS

The PWTech Volute Dewatering Press has been installed to handle a wide range of sludges. It is especially useful when sludges have a high oil and fat content that would blind filter materials.

Other sludges the Volute Dewatering Press has been shown to work well on include:

- DAF float from slaughter houses and other agricultural processes
- Food processing and wash-down wastes
- Oil sludge from machining operations
- Wastes from textile processing

A REVOLUTION IN MUNICIPAL SOLIDS HANDLING

The PWTech Volute Dewatering Press can be set up to achieve both wasting and dewatering of sludge in a single operation. By either connecting the Volute Dewatering Press directly into the biological process or into the RAS piping the unit can automatically switch on and waste and dewater the sludge in one operation. Key benefits of this include:

- Reduction in operator time with the wasting operation
- No need for sludge storage tanks and additional pumping facilities and odor control—can be used to free up existing sludge storage facilities for other uses
- Increased process stability (wasting can occur over long periods of time or several times a day)

Standard Volute Dewatering Press Models

Model	Maximum Capacities		Dimensions (in.)			Weight (lb)		Power Requirement (kW)
	GPM	Dry lb/hr	L	W	H	Dry	Operational	
ES101	4	20	72	27	54	485	665	0.35
ES131	8	38	85	27	54	578	792	0.35
ES132	15	75	93	31	54	705	1,120	0.4
ES201	14	80	114	39	54	1,320	2,288	0.8
ES202	28	160	114	43	57	1,580	2,575	1.1
ES301	35	350	134	39	66	1,700	2,750	1.1
ES302	70	700	145	50	66	2,530	4,224	1.5
ES303	105	1,050	153	63	68	3,570	6,089	2.0

NOTE: All capacities, dimensions, and weights are approximate. Dimensions and power requirement do not include polymer make-up and dosing systems.



410-238-7977 • volute@PWTech.us • www.PWTech.us