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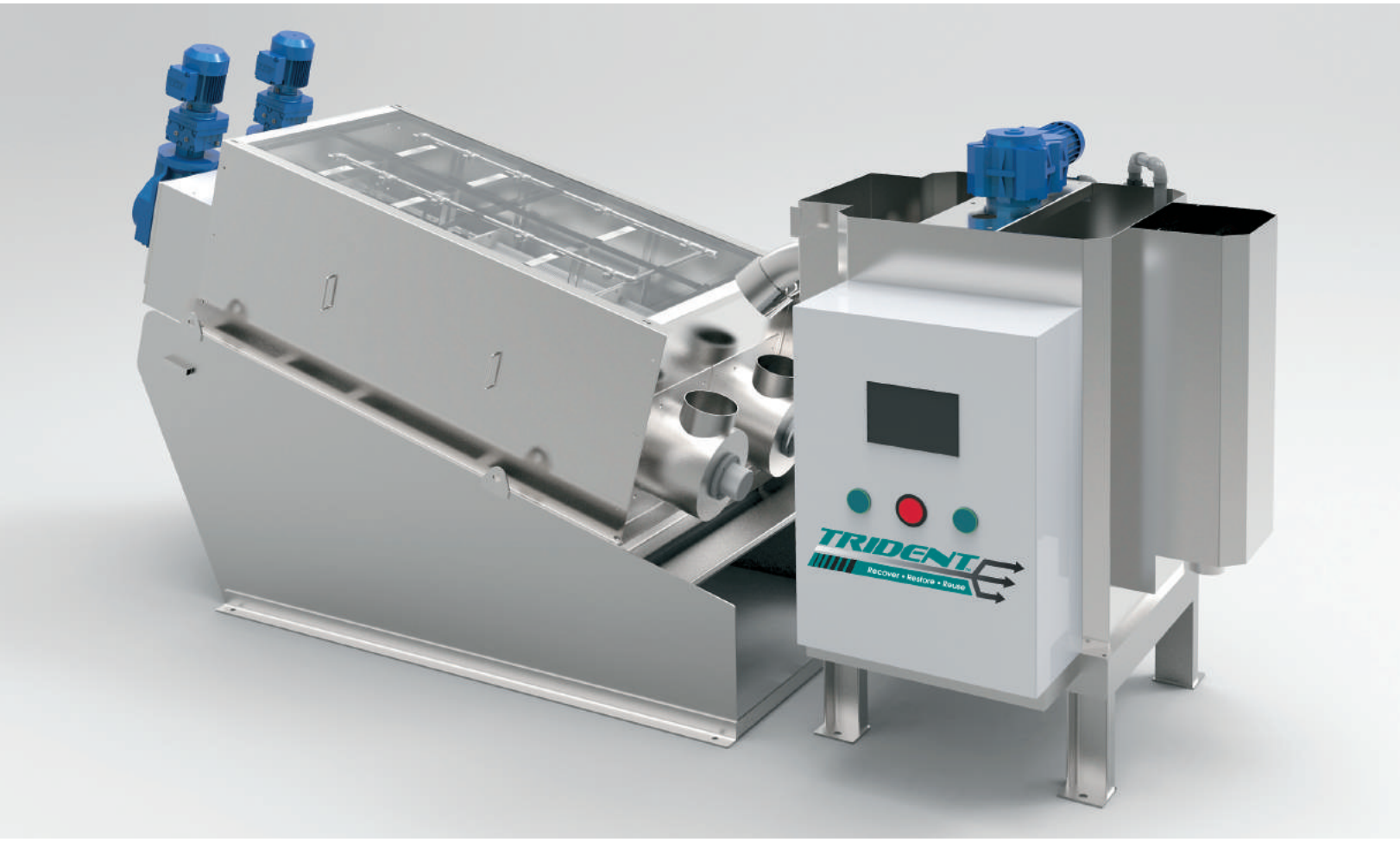
MD PRESS

Advanced Wastewater Solutions



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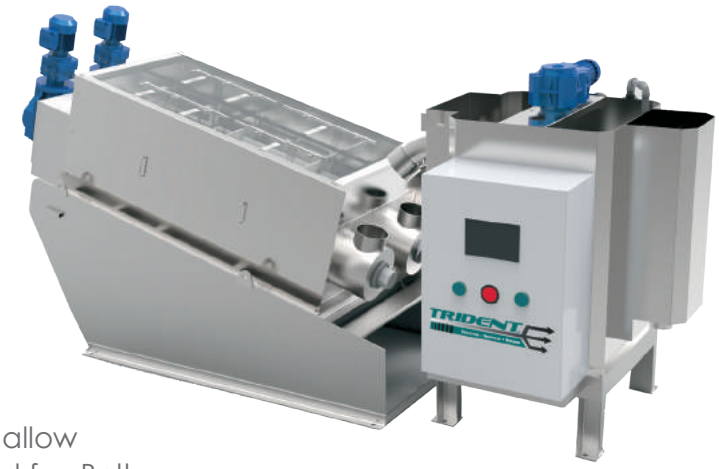
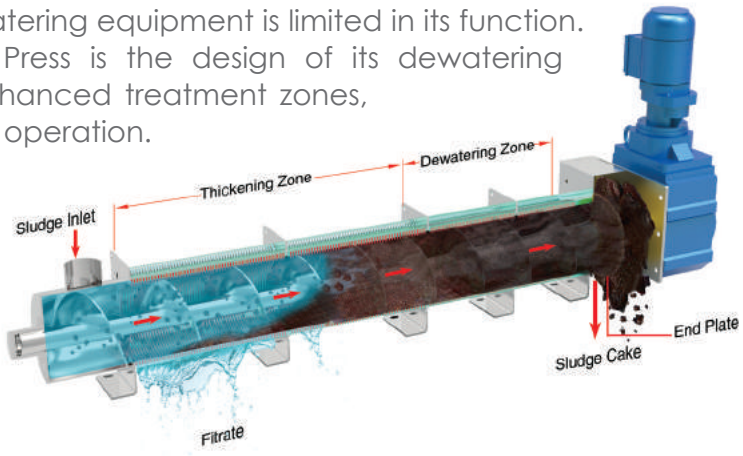
The Problem with Conventional Solutions: Screw Press, Centrifuge, Belt Press



Conventional screw presses, centrifuges and belt presses used to be a common method of dewatering sludge. However, they require continuous operator attention, high energy inputs and a great deal of maintenance. Typically, screw presses utilize perforated or slotted openings, designed to allow liquids to escape as the sludge is pressed. Often this results in unsatisfactory dewatering performance at low pressure, or in plugged screens caused by solids that extrude through the openings. Centrifuges require extremely high energy inputs and excessive maintenance to allow the high-speed operation, that they are designed for. Belt presses, on the other hand, require high operator attendance, continuous maintenance and wash-downs to avoid screen blinding. In modern sludge dewatering operations, these limitations render traditional equipment as inadequate. A better technology is needed.

The Solution is the Multi-Disc Dewatering Concept

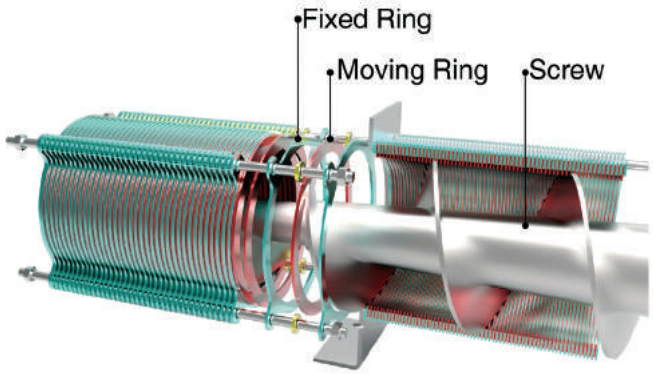
The TRIDENT MD Press excels where other dewatering equipment is limited in its function. Critical to the success of the TRIDENT MD Press is the design of its dewatering cylinder. It features a slip disc design and enhanced treatment zones, allowing thickening and dewatering in a single operation. The need for separate equipment for conditioning and thickening is eliminated. This makes the TRIDENT MD Press a very versatile piece of equipment that is suited for a variety of applications. The press can receive dilute sludge or high solids content directly from all precursor treatment processes and produce a cake with exceptional dry matter.



The TRIDENT Multi-Disc Dewatering Technology

The Trident MD Press features a slow-speed, low-wear screw within a unique multi disc dewatering cylinder. Trident's slip disc technology incorporates a simple and effective method that looks like a stack of washers. This assembly is comprised of precision made stationary rings and moving washers that form a unique tube assembly. When the washers (rings) are moved by the eccentric auger inside the tube a very narrow gap between the washers allows only the liquid excreted from the sludge to escape. The gap is too fine and does not allow the dewatered sludge inside the tube to pass through. At the same time the eccentric auger inside the tube

conveys the dewatered sludge out the end of the TRIDENT MD Press. The result is both a dewatered high solids cake and a clean effluent water ready for disposal. The constant movement between the discs has a self-cleaning effect and prevents clogging. The moving rings along with fluted auger shafts and reduced pitch flighting also aid in the release of liquid from the sludge, further improving the effectiveness of the MD Press.



The Dewatering Process

The WAS and other low density sludges are metered into a flocculation tank for polymerization. Once flocculated, the sludge flows by gravity into the Trident MD Press tube for processing. The effluent and solids are simultaneously separated and discharged. For high density solids such as DAF sludge where flocculation has been previously performed, the thickened sludge can flow directly into the Trident MD Press for dewatering. The entire process can be PLC controlled for automated 24/7 operation.

Features	Benefits
Skid mounted & prewired	Easy installation and setup
Minimal horsepower requirements	Low power consumption & energy costs
Integrated CIP spray bars	Non-clogging operation
No fresh water cleaning required	Eliminates potable wash water requirements
Low speed operation	Low noise output, low maintenance input
In-place shielding & guarding	Reduced odor levels & positive containment
Simplistic function and mechanical operation	Uncomplicated maintenance procedures
Small footprint	Reduced space constraints & deployment
Integrated thickening & dewatering function	Suitable for low and or high density inputs
Efficient slip disc operation	Excellent dewatering & capacity outcomes
Multi directional compression auger	Produces dry high solids cake
Fine slip disc gap interface	Reduces solid excrement and escape, creates a clean, high quality filtrate
Optional PLC controlled & HMI touch screen	Automated for total system integration for continuous and unattended operation

Automation and Integration

The ability to integrate the Trident MD Press in the plant process is critical for the operator and easily achieved. Polymer dosing and feeding system, sludge feed pumps, DAFs and conveyors can be automated and systematically incorporated into the process. Automation packages with operator interface are available to manage the entire process, provide unit operating and alarm outputs and connection to plant PLC & SCADA, for real time diagnostics. The automation includes start up, regular operation, redundancy and interruption events, and shutdown via on-site and remote access.

Operation and Maintenance

A partial rebuild of the dewatering cylinder (replacing discs) is typically recommended every 5,000-10,000 hours. The half-day overhaul can be performed on site with minimal interruption to the customer's operations. Cylinder exchange programs are available for seamless removal and replacement of the equipment.

Consumption and Output Comparisons

- **Rinsing Water Consumption:**
  TRIDENT = 0.03m^3/hr vs. Belt Press = 6m^3/hr
- **Electricity Consumption:**
  TRIDENT = 1kW vs. Centrifuge = 11kW
- **Noise Output:**
  TRIDENT = 65dB vs. Centrifuge = 90dB

Applications

The Trident MD Press is a reliable and versatile dewatering technology that allows treatment of many sludge types and it is suitable for a variety of applications.

High oil and fat materials for instance tend to easily plug up belt press filters, which drastically increases their maintenance requirements and operating costs. Centrifuges on the other hand require immense power to work effectively. With the new MD Press technology customers finally have an efficient solution that addresses their operational needs:

- Sludge from processed flow-back water from oil and gas operations
- DAF sludge from livestock waste or meat processing operations
- Municipal sewage and wastewater treatment processes
- Food and beverage processing waste treatment
- Sewage sludge from remote camp operations
- Sludge from biological treatment processes
- Oil sludge from machining operations
- Sludge from chemical industry
- Wastes from textile industry
- And many more

A Cost Savings Revolution in Sludge Dewatering

The Trident MD Press revolutionizes municipal and industrial dewatering processes. Its advanced design allows both thickening and dewatering of sludge in a single operation, saving costs and outperforming other dewatering equipment such as centrifuges or belt presses in efficiency.

In municipal applications, the Trident MD Press can receive sludge directly from a biological treatment process such as aeriation lagoon or oxidation ditch, eliminating the need for separate thickening and storage tanks. The result is a significant reduction of process time, operator attendance and equipment capital cost.

The MD Press's ability to dewater different sludge types, including oily and fatty material, also makes it an ideal technology for many industrial applications. Clog-free operation and low odor and noise generation create additional benefits. All MD Presses require a relatively small foot print and are easy to integrate in existing processes. The smallest MD model processes ~5lbs DS/hour, the largest single unit can process up to ~4000lbs DS/hour.

Technology Comparison Table

Capability/Feature	Trident MD	Belt Press	Centrifuge
Highly dilute sludge	Yes	No	No
Pre-thickening	Not required	Required	Required
Storage tank	Not required	Required	Required
Footprint	Small	Large	Small
Power requirements	Low	High	High
Wash water consumption	Extremely low	Extremely high	Low
Noise generation	Extremely low	High	High
Vibration	Extremely low	High	High
Maintenance requirements	Low	High	High
24 hour operation	Yes	Yes	Yes

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