

WHICH SLUDGE DEWATERING EQUIPMENT TO CHOOSE ?

Recent times the industry has seen a significant increase in the cost of sludge and solid waste disposal primarily either due to higher surcharges due to moisture content or LOI value. From this the easiest to control parameters the moisture content. For this the industry is constantly seeking alternative technologies to economically dewater sludge for smooth operation of their wastewater treatment plants (ETPs & STPs)

There are 3 major technologies used for sludge dewatering commonly used in ETPs & STPs

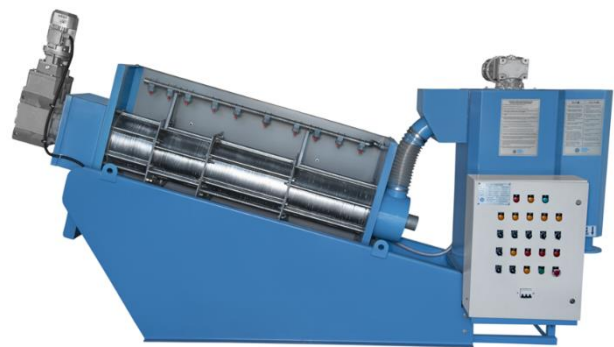
1. Poly propylene recessed plate filter press
2. Decanter centrifuge
3. Multi Disc Screw Press

From the various technologies available in the market, the most conventionally used is the PP cloth filter press or the decanter centrifuge. Both are now seen as either labour intensive (filter press) or high-power consuming & high maintenance (decanter centrifuge). More recently, a new technology which offers a continuous sludge dewatering operation with no labour requirement, very low power consumption and ultra-low maintenance is the Multi-Disc Screw Press technology developed in 1990s Japan and now matured into the most economically effective, simple and rugged sludge dewatering equipment.

In this article, we explore how the MDSP technology differs from the conventional on all operational fronts along with the economic feasibility assessment for replacement of old equipment.

WHY MULTI DISC SCREW PRESS ?

1. The biggest advantage is power consumption which is 10 times less than centrifuge and 3 times less than filter press
2. Labour cost is very low compared to filter press as the operation is continuous, as there is no need to replace and wash filter cloth like PP filter press
3. Compared to centrifuge and filter press, the screw press is more versatile and can handle variety of sludge compared to centrifuge and filter press
4. Maintenance is very low compared to both centrifuge and filter press as the machine speed is low 4-6 rpm only
5. Polyelectrolyte consumption in the screw press is much lower than the decanter centrifuge



**YOU SAVE ABOUT
90% ON THE
RECURRING OPEX !!**

IN SCREW PRESS COMPARED TO
ANY OTHER TECHNOLOGY IN
MARKET !!

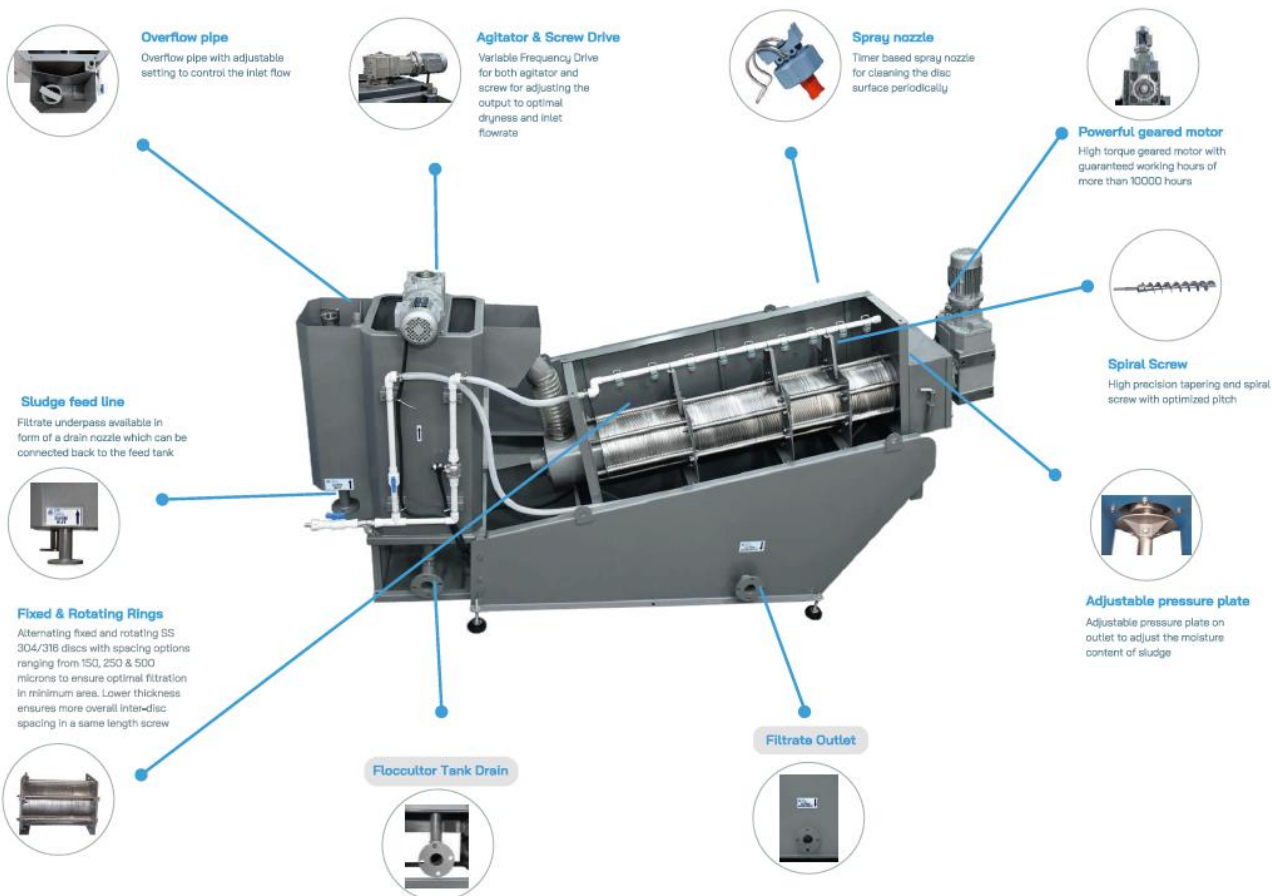
A typical use case scenario of return-on-investment calculation for the multi disc screw press versus decanter centrifuge

Return on Investment for 5 m³/hr @ 1% capacity

Multi Disc Screw Press Vs Decanter Centrifuge

Sr.No.	Parameters	Units	Multi Disc Screw Press	Decanter Centrifuge
1	Maintenance	-	Machine speed 6 RPM (Zero Maintenance)	Machine speed 4000-5000 RPM (High Maintenance, Greasing service required)
2	Motor Rating	Kw	1.1	20
3	Power Consumption @22 hours	Kwh	24.2	440
4	Cost of Electricity per Unit	Rs/Kwh	8	8
5	Cost of Electricity per day Operation	Rs/Day	193.6	3520
6	Capital Cost	Rs	13,00,000	0
7	Cost of Maintenance	Rs/year	0	2,00,000
8	Saving	Rs/Year	1197920	-
9	Payback Period	Year	1.09	-

Key Parts and Features



A typical use case scenario of return-on-investment calculation for the multi disc screw press versus decanter centrifuge

Parameter	Multi Disc Screw Press	Centrifuge Decanter	PP Filter Press
Power Consumption	1.1 kW	15 kW	5 kW
Maintenance Mechanical	Operated at only 4-6 RPM almost zero wear & tear; Complete built is in SS 304/316L	Operated at only 4000-5000 RPM with high chances of major wear & tear; Only water contact parts are in SS and rest non-contact portion is in MSEP	Replacement of cloth due to clogging. Build is generally MSEP thus high corrosion potential
Soil Content of dewatered sludge	20-25% w/w solids (75-80% moisture)	15-20% w/w solids (85-80% moisture)	20-30% w/w solids (70-80% moisture)
CAPEX	10% lower than the Decanter centrifuge typically	Highest cost in the category	Slightly lower than multi disc screw press, but considering auxiliaries like screw pump for feed at high pressure, the net cost is usually higher than the multi disc screw press
Recurring CAPEX	Almost Zero, 5-10% of the rings need to be changed every 4-5 years	Very high due to vibrations and also highly skilled manpower is required for regular preventive maintenance	Medium compared to decanter centrifuge however, the cloth efficiency need to be monitored regularly and the replacement might as to the regular CAPEX every 6-9 months
Chemical Cost	50% of that from centrifuge when processing biological sludge	Highest requirement of polyelectrolyte	Almost same as the screw press, sometimes lower or none in case of primary chemical sludge
Noise & Vibration	No noise and vibration as all moving parts are at low RPM	Very high noise level	No noise and vibration as no moving parts are there
Labor Cost	No labour cost of manual handling of sludge as it is in continuous application	No labour cost of manual handling of sludge as it is in continuous application	Very high labour cost and labour intensive as the manual cleaning and the changing of cloth is required. Moreover, the sludge handling is also required to be manually which is also a health hazard



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