



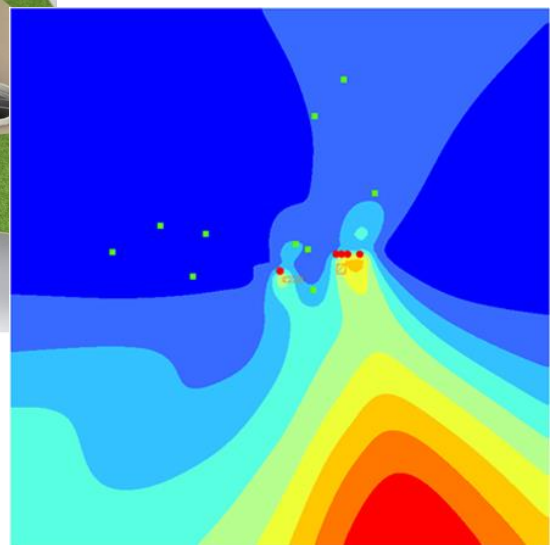
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### **Message from the editor**

Dear friends, this newsletter cum journal is the first issue of the monthly mouthpiece, which will be published by the environmental auditor association– a nonprofit professional association of all environmental auditors.

Before starting this endeavour, we remember & revere our mother nature and dedicate this monthly.

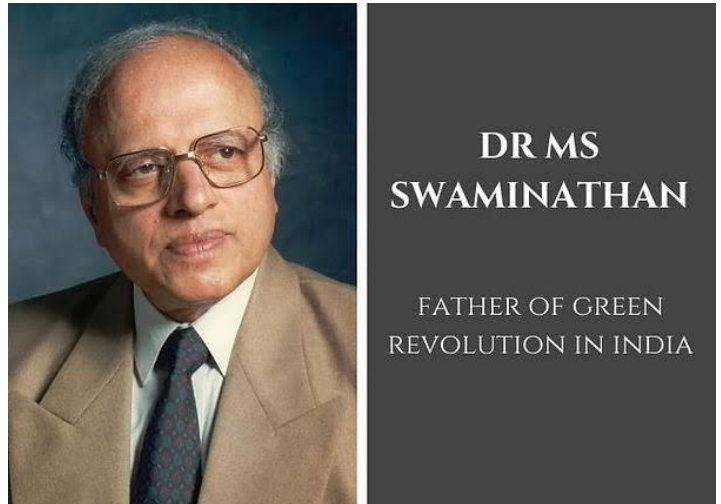
**“to all those pioneering environmentalists, engineers & scientists who shaped our modern environmental movement & continuously strive for preservation of our environment”**

## **NEWS IN SPOTLIGHT**

### **A giant is lost.**

**M.S. Swaminathan, the conservationist and advocate of environmental protection died on 28-09-2023 in Chennai**

Much has been said and written about the role of M.S. Swaminathan (1925-2023) in accelerating agricultural growth through applications of science and technology.



### **New UN framework to protect environment from harmful chemicals.**

Agreed at the fifth International Conference on Chemicals Management ([ICCM5](#)), in Bonn, Germany, the Global Framework on Chemicals sets concrete targets and guidelines across the lifecycle of chemicals.

Inger Andersen, Executive Director of the UN Environment Programme ([UNEP](#)), welcomed the new framework.

“Everyone on this planet should be able to live and work without fear of falling sick or dying from chemical exposure. Nature, free from pollution, should be able to thrive and support humanity for millennia to come,” she [said](#).

“This is why this framework provides a vision for a planet free of harm from chemicals and waste, for a safe, healthy and sustainable future.”

### **Aravalli fly ash disposal**

The National Green Tribunal (NGT) [directed that a notice](#) be issued to the chief engineer and executing engineer, Faridabad Thermal Power Station, a unit of Haryana Power Generation Corp Ltd.

The notice was issued on the basis of a joint committee report about fly ash lying at a site in the Aravalli range even after closure of the power plant in Bata Chowk, Faridabad.

This is a violation of Aravalli Notification issued on May 7, 1992, by the Union Ministry of Environment, Forest and Climate Change, restricting certain activities in specified areas of the Aravallis.





## Hot, Hotter & Hottest !? Prepare for 2024 after records shattered in 2023 says World Meteorological Organization

Quoting a Financial Times article “This year has “shattered” climate records and is set to be the hottest since measurements began, with greenhouse gas and sea levels reaching all-time highs and Antarctic sea ice at record lows, a pattern set to continue in 2024, said the World Meteorological Organization.”

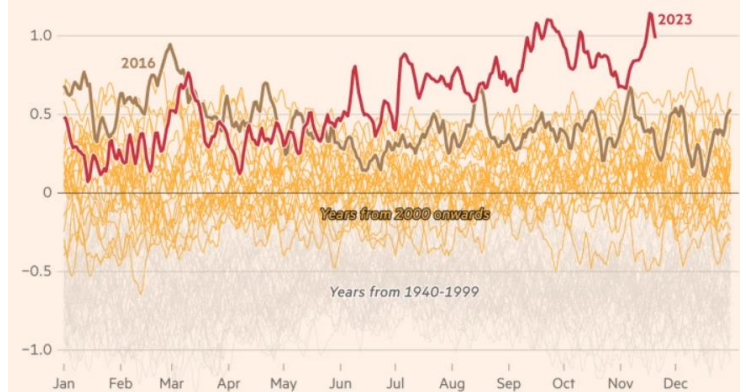
The El Niño weather phenomenon, is likely to result in further higher temperatures in 2024 because it “has the greatest impact on global temperatures after it peaks”, said the WMO, adding that the past nine years, 2015 to 2023, were the warmest on record.

***“A deafening cacophony of broken records” in 2023, the WMO said.***

***“These are more than just statistics. We risk losing the race to save our glaciers and to rein in sea level rise,” said WMO secretary-general Petteri Taalas. “We cannot return to the climate of the 20th century, but we must act now to limit the risks of an increasingly inhospitable climate in this and the coming centuries.” waste, for a safe, healthy and sustainable future.”***

**2023** is on course to be the warmest on record

Daily global 2-metre surface temperature anomaly, 1991-2020 baseline (C)



Source: Copernicus  
© FT

### What can we do about it?

**Yes, this is a direct conversation with our reader!**

**Have you thought about changes in your lifestyle (small and big) along with initiatives?**

**Let's start small!**

**Let's plant a tree!**

**#EAAcares #plantatree**



# LATEST NOTIFICATIONS

## ***Ministry of Environment, Forest & Climate Change***

1. **OCTOBER 13, 2023 | Order F.No. 22-8/2020-IA.III [E134970]:** Reconstitution of Expert Appraisal Committee (Industry-3) for Environmental Impact Assessment of projects requiring Environmental Clearance under the provisions of Environmental Impact Assessment notification, 2006
2. **OCTOBER 7, 2023, | Corrigendum of Biological Diversity (Amendment) Act, 2023**
3. **OCTOBER 7, 2023 | [Biological Diversity \(Amendment\) Act, 2023](#)**
4. **JANUARY 3, 2024 | OFFICE MEMORANDUM (29-12-2023) - Internship Scheme of the Ministry of Environment, Forest and Climate Change – Nomination of candidates for the Winter Session 2023-24**

## ***National Green Tribunal—Major orders in last month***

1. **JULY 2023 | Bird's eye view of NGT performance in the last five years (July, 2018 – July, 2023)**

Refer following link:

[https://greentribunal.gov.in/sites/default/files/important\\_orders\\_NGT\\_Initiatives%20final-1.pdf](https://greentribunal.gov.in/sites/default/files/important_orders_NGT_Initiatives%20final-1.pdf)

2. **DECEMBER 2023 | Direction to all ULBs to new treated sewage effluent standards for new & existing sewage treatment plants** (pH 5.5-9; BOD 10 mg/l, TSS 20 mg/l, COD 50 mg/l, Total N 10 mg/l, Total Phosphorous 1, Faecal Coliform (count/100 ml), Desirable 100, permissible-230)

## ***NABL important notifications & updates related to testing laboratories***

1. **JULY 2023 | Application Form for Testing Laboratories**
2. **SEPTMEBER 2023 | Terms & Conditions for Obtaining and Maintaining NABL Accreditation**
3. **OCTOBER 2023 | Accreditation Process & Procedure**
4. **NOVEMBER 2023 | Date extended for converting laboratory business constitution**

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# TRAINING & EDUCATION CORNER

## **ADEQUACY OF EFFLUENT TREATMENT PLANT — A CRASH COURSE ON THE SCIENCE TO DETERMINE THE KEY PERFORMANCE AND SIZES**

(Author– Urv Patel)

It has been observed that many a times when the question of adequacy is asked, the most important question is to answer how exactly an auditor can determine the adequacy of a environmental management system. In this article, we will explore the various methodology for ascertaining the adequacy of wastewater EMS– i.e. Adequacy of ETP and STPs

There are 2 major strategies through which the adequacy of a wastewater treatment plant can be determined:

1. Water quality analysis of raw effluent & final treated water
2. Design proof checking of each unit processes for adequate sizing as per the design parameters

### **DETAILED DESCRIPTION OF STRATEGYIES**

#### **1. Water quality analysis of raw effluent & final treated water**

This method, simply relies on the treated effluent and raw effluent characteristics, though which an auditor determined that the plant is performing as per the intended key performance indictors (KPIs). In simple words, if the treated effluent is under the permissible limit and the percentage reduction is as stipulated in the CCA (pollution control board consent), then the plant is assumed to be adequate.

Following are the advantages and drawbacks tied to this method

#### **ADVANTAGES**

- Simple and fast, the method gives a very quick idea regarding the performance of ETP & the STP

- Cheaper to determine as only analysis of wastewater is required for 2-3 samples

#### **DRAWBACKS**

- The performance is not representative of nameplate capacity, as the raw effluent flow and characteristics may be lower than the full flow capacity
- It is highly sensitive method when the sample size is very less, only 1-2 day sampling may not be representative of the consistency of operations around the year
- Only useful for a prima facie assessment of the ETP- STP performance, and cannot be used to certify the adequacy of the ETP or STP

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## 2. Design proof checking of each unit processes for adequate sizing as per the design parameters

This method, is a much more systematic approach towards the performance appraisal of a wastewater treatment plant (WWTP), in which each unit operations and processes like equalization, aeration tank, anaerobic digester, secondary clarifier, tertiary treatment and others are proof checked for size. For example, the size of aeration tank can be checked by the biokinetics based approach or empirical approach by plugging in the full nameplate flow capacity and maximum effluent loading (COD/BOD/Ammonia etc.) in the textbook equations.

An illustration to check for **secondary clarifier sizing**:

1. Calculate the surface overflow rate & solids loading rate of the clarifier at average and peak, and take maximum of the 4 as design parameter
2. As per the selected SOR/SLR calculate the diameter or surface area of clarifier required
3. If the available is more than required then the size is adequate

**Design parameter for secondary clarifier for activated sludge process (Source: CPHEEO)**

Type of Settling	Overflow rate, cum/sqm/day		Solid loading, kg/day/sqm		Side Water Depth, m	Weir loading, cum/m/day
	Average	Peak	Average	Peak	Average	Average
Primary Clarifiers						
Primary Settling only	25 - 30	50 - 60	Not applicable		≥ 2.5 - 3.5	125
Followed by secondary treatment	35 - 50	80 - 120	Not applicable		≥ 2.5 - 3.5	125
With excess sludge return	25 - 35	50 - 60	Not applicable		≥ 3.5 - 4.5	125
Secondary Clarifiers						
Secondary settling for activated sludge	15 - 35	40 - 50	70 - 140	210	≥ 3.0 - 3.5	185
Secondary settling for extended aeration	8 - 15	25 - 35	25 - 120	170	≥ 3.0 - 4.0	185

Note: Where the mechanized aerobic treatment is used after UASB reactor, the settling tank design shall be based on conventional activated sludge process as above.  
Source: CPHEEO, 1993 and as recommended in the present manual

Similarly, aeration tank, sand filter, activated carbon can be calculated based on standard spreadsheet calculators. A good resource, we have developed can be accessed online free of cost on following link:

**<https://swaenviro.com/calculate-aeration-tank-size-asp/>**

## ADVANTAGES

- More reliable check for the sizing as it is based on the worst case scenario
- The method provides a good understanding whether the performance of the ETP or STP will be consistent or otherwise across the year
- Best possible fundamental assessment of the adequacy compared to just treated effluent analysis
- The practical analysis of the inlet and outlet can be used to help verify the theoretical calculation

## DRAWBACKS

- Requires an experienced engineering calculations along with worst case design parameters
- The theoretical analysis which provides the basis may be inaccurate as it does not encompass, all the practical variables like slowly biodegradable COD and inhibitory components like phenol and other solvents which directly affects the biological activity (For this a more detailed piloting is required for the in depth assessment and adequacy)

Although, due to the ceremonial nature of environmental audit and adequacy certification for effluent treatment, it has become a norm to issue a certificate without proper assessment of the sizing based on design parameters and actual flow conditions or nameplate capacity

**In conclusion**, it is strongly advised to all the environmental auditors to use a more scientific and representative approach rather than just an observation of performance based on 1-2 effluent samples.

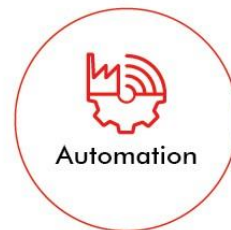
Good resources available for the calculations:

- [Wastewater Engineering: Treatment and Resource Recovery](#), Metcalf & Eddy Ed-5
- CPHEEO manual for wastewater treatment
- <https://swaenviro.com/calculators>

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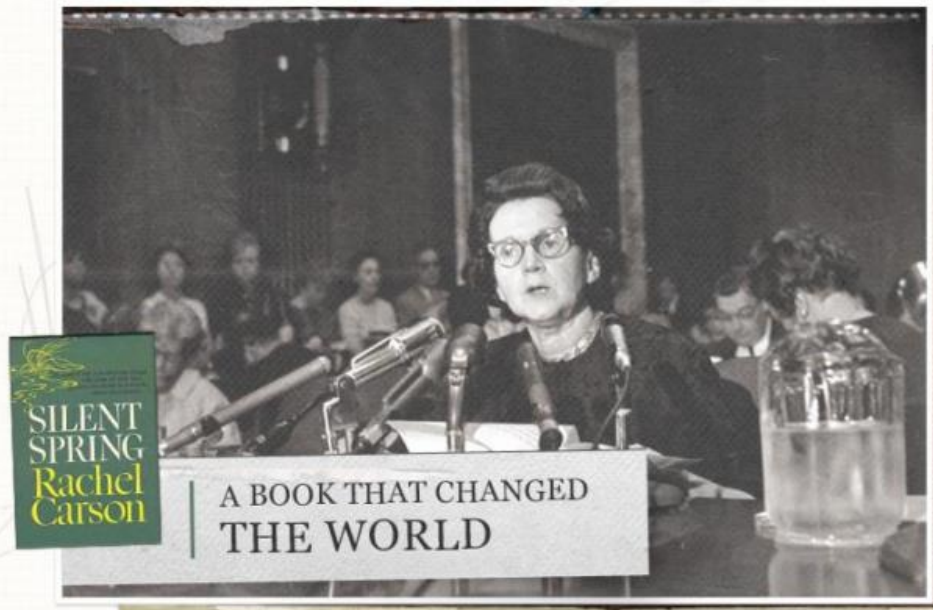
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## BOOK REVIEW

### *Silent Spring— by Rachel Carson*



Rachel Carson testifying before the Senate Government Operations subcommittee studying pesticide spraying on 4 June 1963.

**Reprinted from “Environmental & Society Portal”  
authored by Mark Stoll**

The history books say that the American environmental movement began on 16 June 1962, the date of the New Yorker magazine that contained the first of three excerpts from Rachel Carson’s new book, *Silent Spring*. Controversy ignited immediately. Just five weeks later, before the book was even out, a 22 July headline in the New York Times declared, “‘Silent Spring’ is Now Noisy Summer.” Houghton Mifflin released *Silent Spring* on 27 September. It sold hundreds of thousands of copies and stayed on the best-seller list for thirty-one months.

Reviewer Walter Sullivan was only the first of many to compare *Silent Spring* to Harriet Beecher Stowe’s novel *Uncle Tom’s Cabin*, the most controversial American book of the nineteenth century. *Silent Spring* inspired immediate outrage and opposition. Chemical and agricultural spokesmen loudly attacked both the book and its author. They alleged ignorance, hysteria, misstatements, cultism, and communist sympathies. Yet *Silent Spring* also galvanized conservationists, ecologists, biologists, social critics, reformers, and organic farmers to join in the American environmental movement.

Carson’s sensational best seller helped transform and broaden the older conservation movement into more comprehensive and ecologically informed environmentalism. Moreover, through dozens of translations, *Silent Spring* affected events abroad and prepared the way for the rise of environmental and Green movements worldwide. Today, half a century later, *Silent Spring* continues to outrage many conservatives and inspire environmentalists. Quiet, reserved, and very private, *Silent Spring*’s author was no radical rabble-rouser. Carson was born on 27 May 1907 in Springdale, Pennsylvania, near Pittsburgh. From an early age she aspired to be a writer but at college she switched her major from English to biology. Carson earned a master’s degree in zoology from Johns Hopkins University in 1932 but interrupted her doctoral studies due to financial problems during the Great Depression. She took a job as a biologist with the US Bureau of Fisheries—later the US Fish and Wildlife Service—and wrote and edited informational materials for the public.

(The complete review can be accessed at [https://www.environmentandsociety.org/sites/default/files/rachelcarson\\_silentsspring\\_version2\\_1.pdf](https://www.environmentandsociety.org/sites/default/files/rachelcarson_silentsspring_version2_1.pdf))





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# TECHNOLOGY REVIEW

## WHICH SLUDGE DEWATERING EQUIPMENT TO CHOOSE ?

(Advertorial)

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)

(Advertorial sponsored by DEPL)



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



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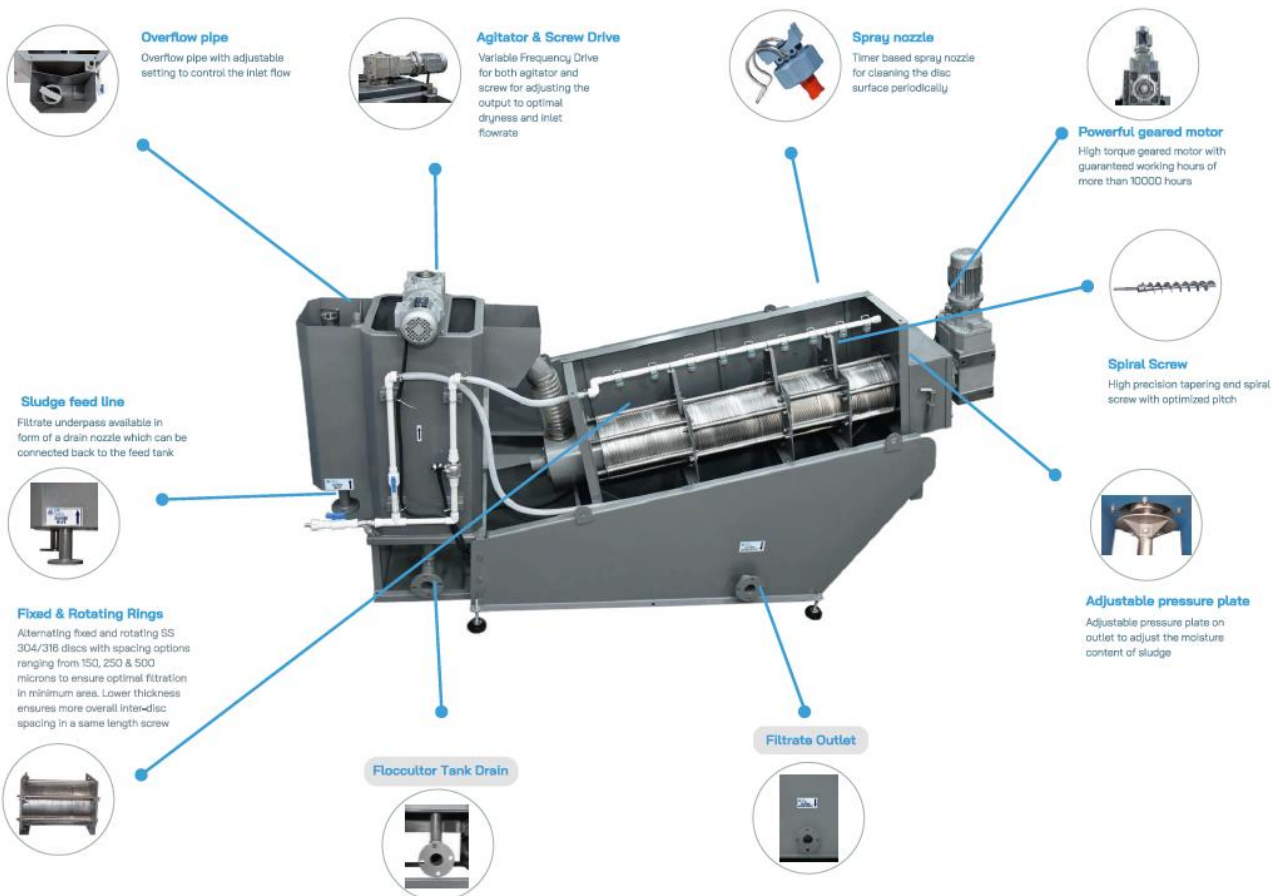
**A typical use case scenario of return-on-investment calculation for the multi disc screw press versus decanter centrifuge**

**Return on Investment for 5 m<sup>3</sup>/hr @ 1% capacity**

**Multi Disc Screw Press Vs Decanter Centrifuge**

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

**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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