Jash Engineering Ltd, India

Jash USA Inc, USA

Mahr Maschinenbau Ges.m.b.H, Austria

Engineering & Manufacturing Jash Ltd, Hong Kong

Rodney Hunt, USA

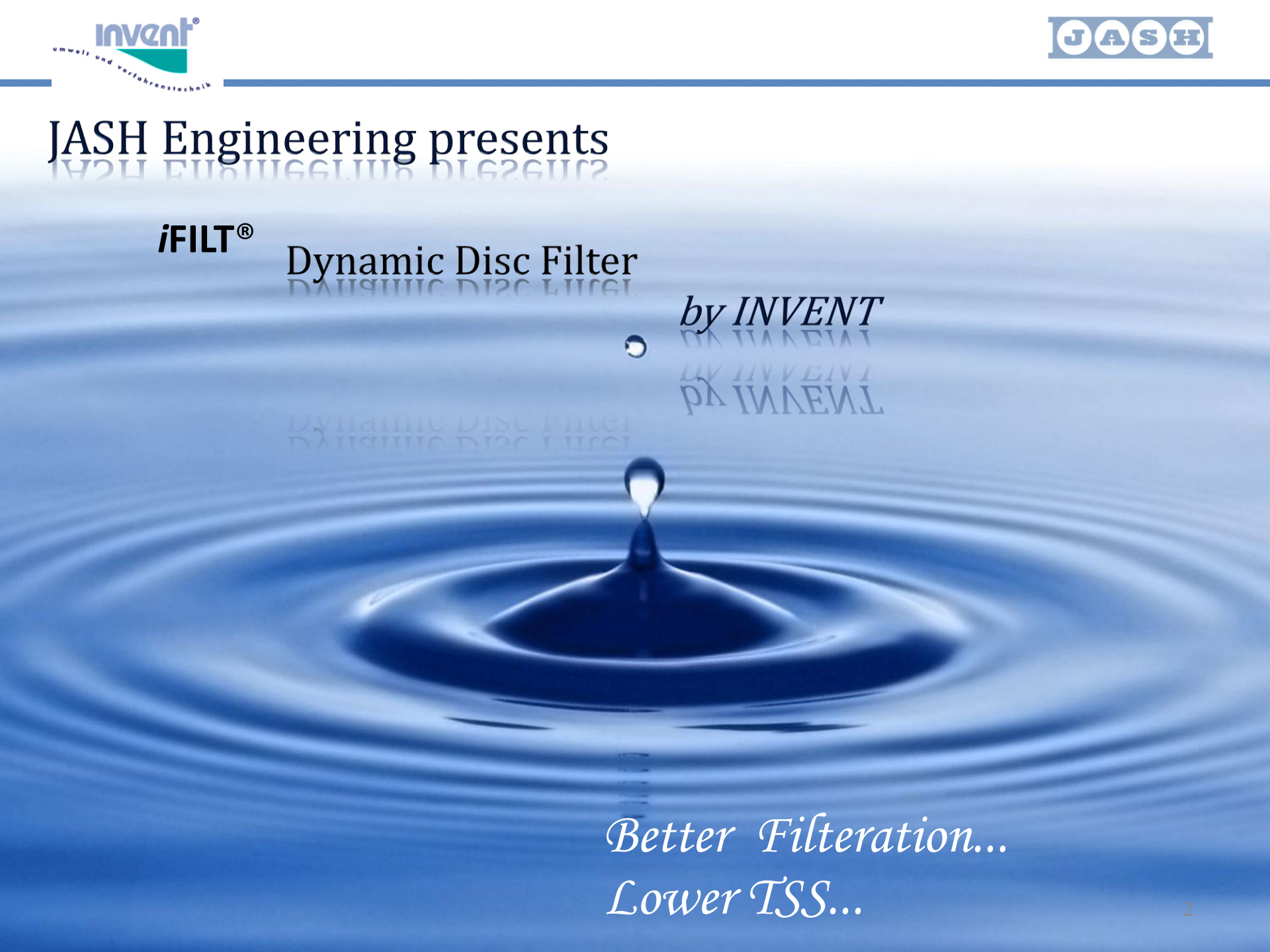
Thinking Innovative, Since 1948

JASH Engineering presents

*i*FILT®

Dynamic Disc Filter

by INVENT



Better Filteration...

Lower TSS...

About Jash Engineering

Jash Engineering Ltd, is 70 years old reputed company manufacturing and supplying various water and waste water treatment related products.

Jash Engineering Ltd have recognized the need of Disc filters in all the water and waste water treatment plants in India to maintain treated water TSS below 10 mg/l before it is let off to any water source as per the new CPCB / NGT requirements and encouraged Jash Engineering to search for a technology that provides quality product at an affordable price.

Jash Engineering is now happy to join hands with INVENT of Germany for manufacturing their ***i*FILT®** range of Dynamic Disc filters in our Indore plant.

About INVENT:

INVENT Umwelt is known as the leaders in mixing and aeration apart from filtering technology. Since 1990, **INVENT** Umwelt has been producing and supplying innovative machines, systems and processes across the globe.

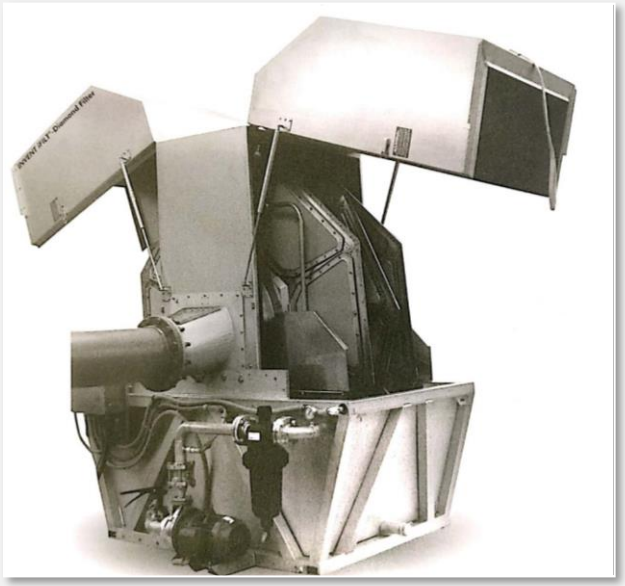
Leaders in mixing, filtration and aeration

www.invent-uv.de

INVENT Headquarters in Erlangen, Germany:

INVENT Headquarters in Erlangen, Germany:

Jash introduces for the first time in India…



Being manufactured by:

JASH ENGINEERING LTD, INDIA

In Technical Collaboration with :

INVENT, GERMANY

IFILT Diamond Filter - Application

***i*FILT®** Diamond Filter is meant especially for the separation of solids from fluids as the next treatment phase after secondary sedimentation.

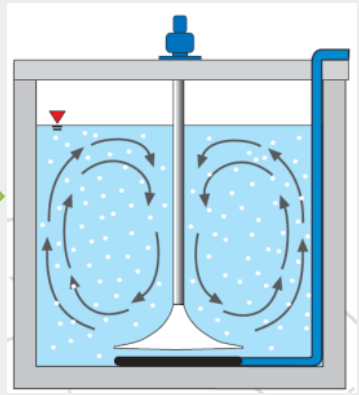
***i*FILT®** Diamond Filter removes the smallest suspended that are still present in secondary effluent Viz.

- Activated sludge particles,
- Precipitation particles after phosphorous reduction,
- Powdered activated carbon,
- Microplastics etc.

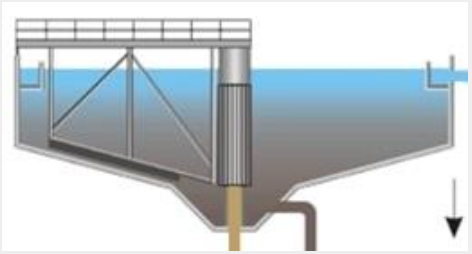
- Filtration of storm water after chemical precipitation and flocculation with Polymer,
- Algae removal for drinking water applications,
- Removal of suspended clay and silt particles in Raw water treatment plant and so on.
- Industrial application such as paper & pulp, beverage, fisheries textile etc.

Application : Tertiary Waste Water Treatment

Aeration Tank



Final Sedimentation

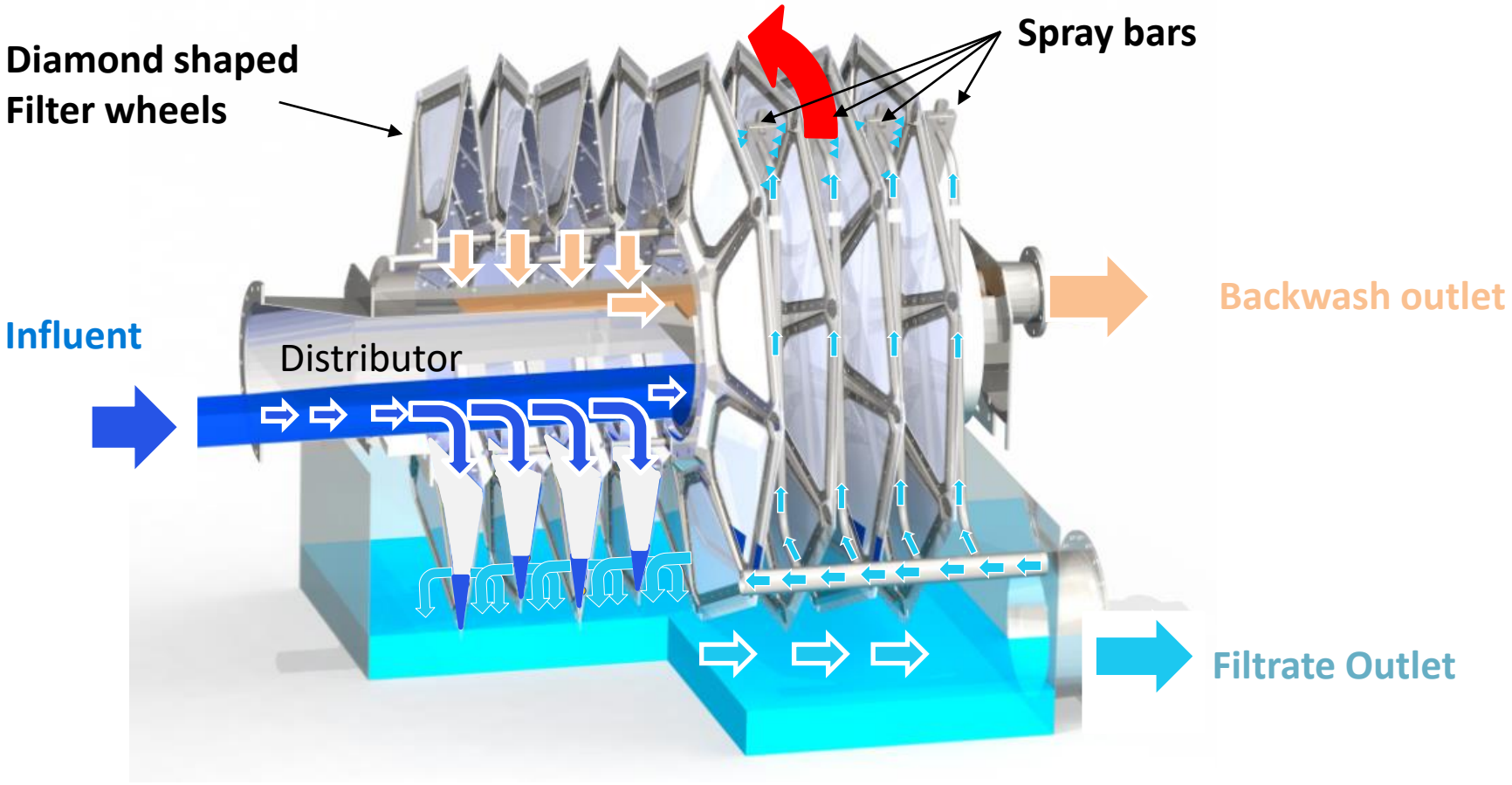


TSS in≈20-40mg/l

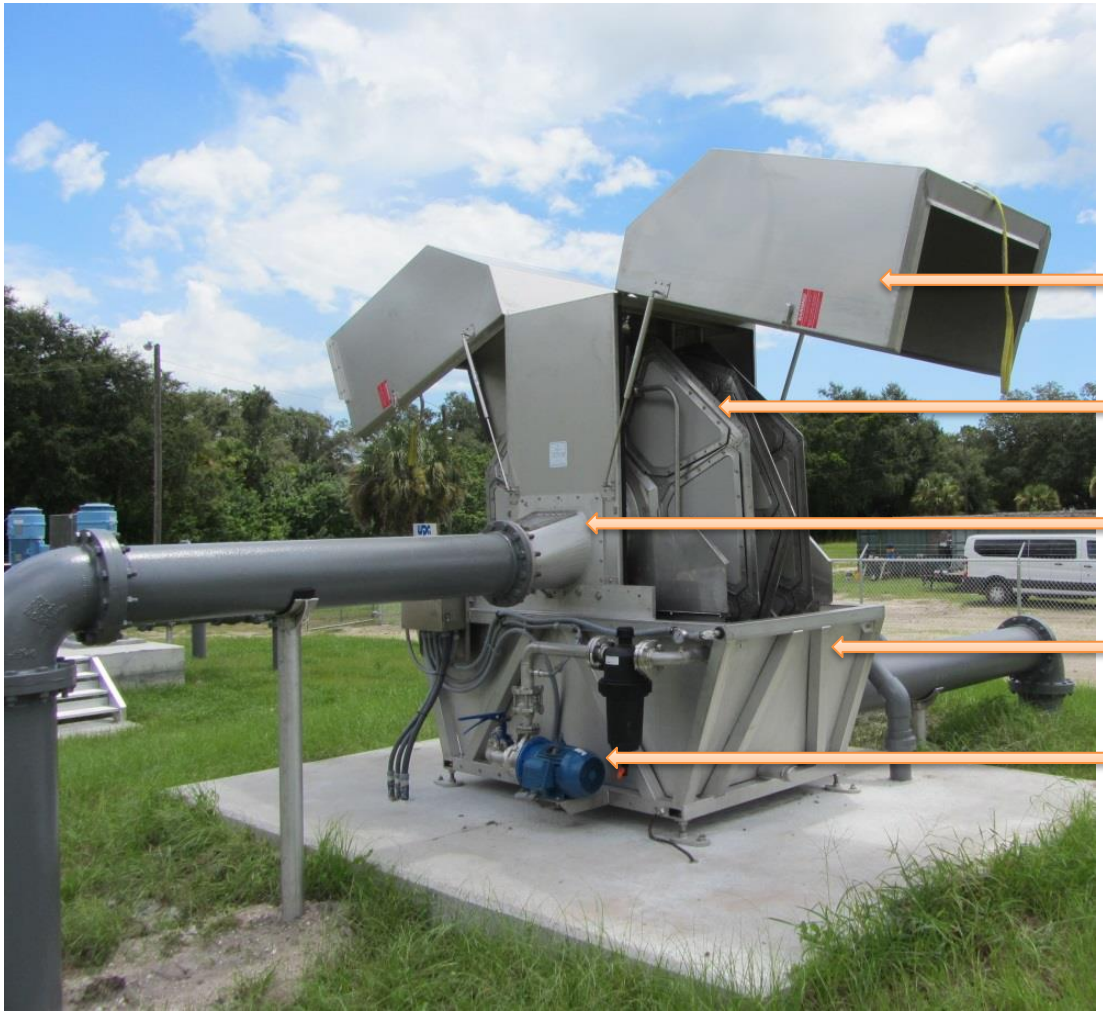
iFILT Diamond Filter

TSS out≈5-10mg/l

Operational principle



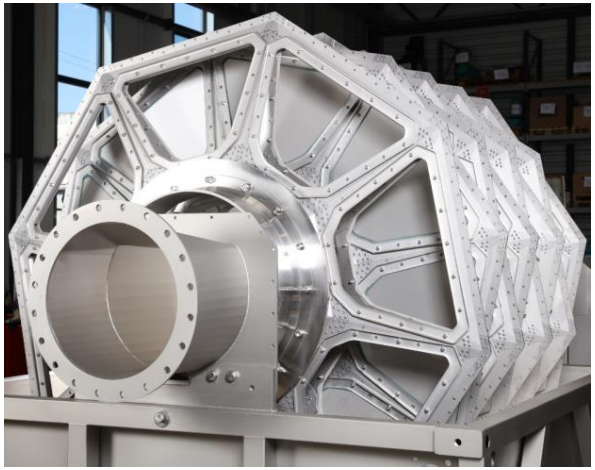
Construction:

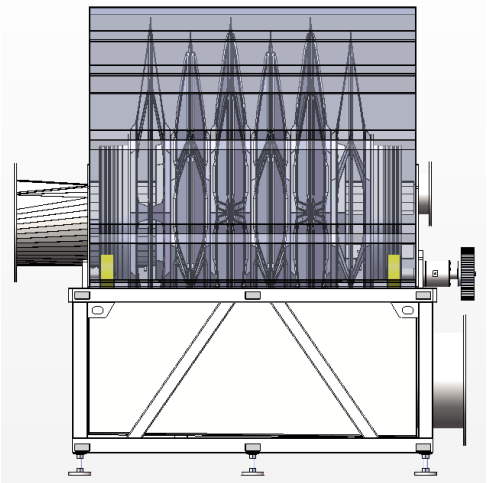


Construction

Construction

Rotor with Diamond shaped Filter wheels

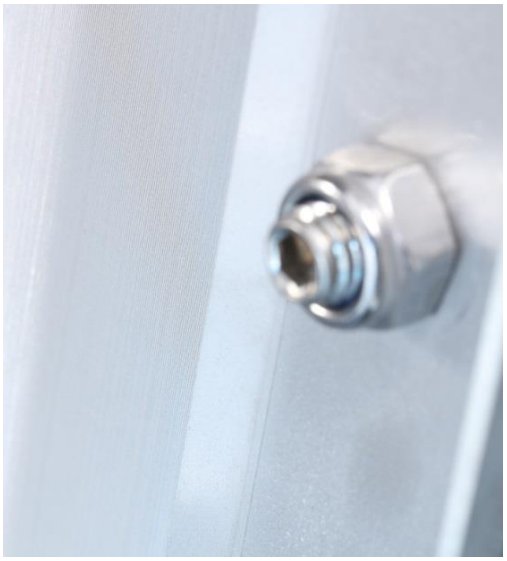


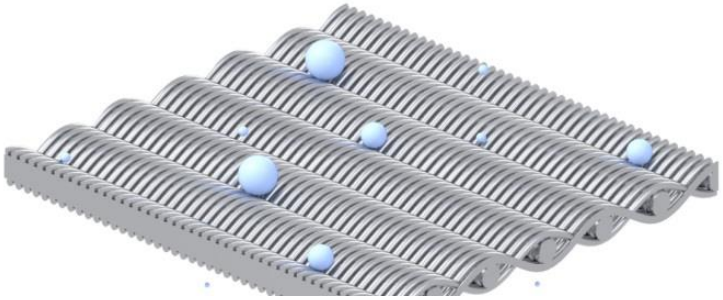


- Filter wheels are supported on rollers and directly connected to each other.
- Each wheel is formed of 16 filter frames and there are 16 wheels per rotor maximum.
- Diameter of wheel : 2100 mm
- Rotational speed: up to 12 rpm
- Made from Stainless steel 304 or 316.
- Continous rotation throughout the operation results in to higher throughput.
- Internal bypass available by using additional overflow wheels

Construction

Filter Mesh

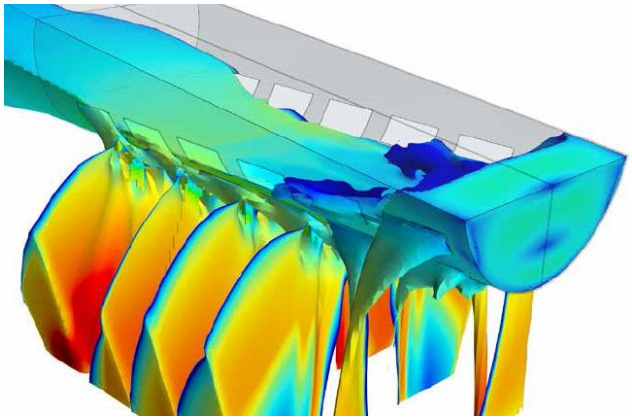


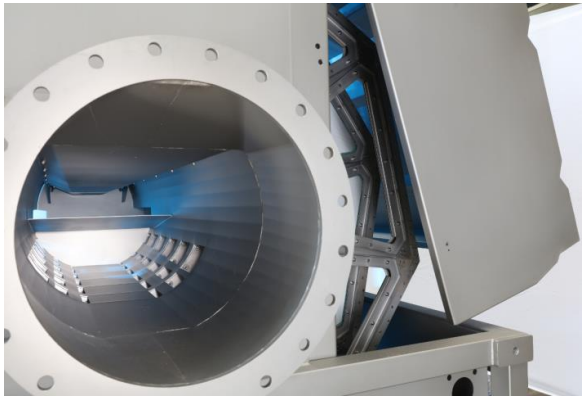


- Three-dimensional Dutch woven mesh made out of SS 316 threads.
- The standard pore size is 10 µm. Depending upon the application, mesh with even up to 100 µm can be provided
- Long life time due to higher strength of stainless steel.
- High resistance to chemicals used for routine cleaning of mesh.
- Ensures that the pore size stays the same and not get bigger during panel fabrication.

Construction

Distributor

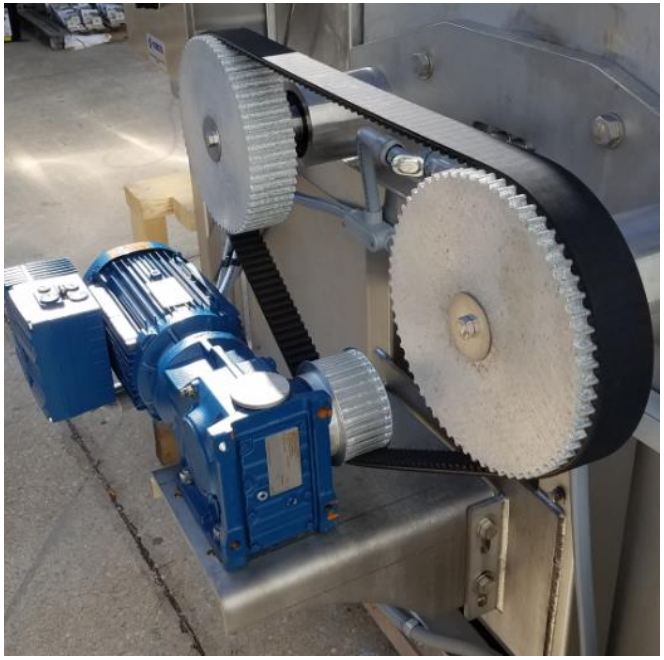




- Fluid dynamically designed and optimized with Computational Fluid Dynamics (CFD) simulations and verified through tests at our facility.
- Ensures equal distribution into each filter wheel.
- Eliminates high maintenance prone large inlet/outlet sealings.

Construction

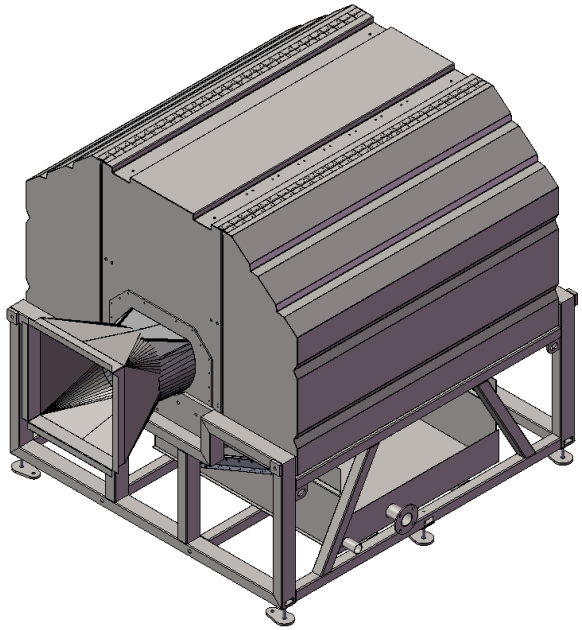
Drive Mechanism



- Driving parts installed outside of the tank and unsubmerged.
- Rotation is transmitted to trunnion wheels, on which the filter rotor is supported.
- Belt being made of Carbon impregnated polyethylene, does not require frequent re-tensioning.
- Unlike the chain, belt does not require any periodic lubrication and has very long life of > 10 years.

Construction

Tank / Tray



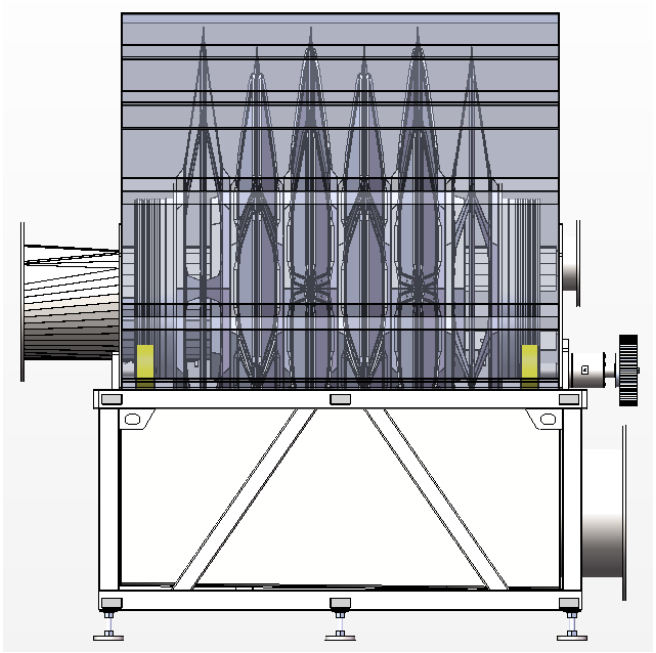
After the filtration, the filtrate is collected in the filtrate Tank/ Tray. There are two types of arrangement:

1. If the Diamond filter is kept above the ground level, then the influent shall be sent in the machine essentially by pumping and the filtrate gets collected in the stainless steel tank (recommended).

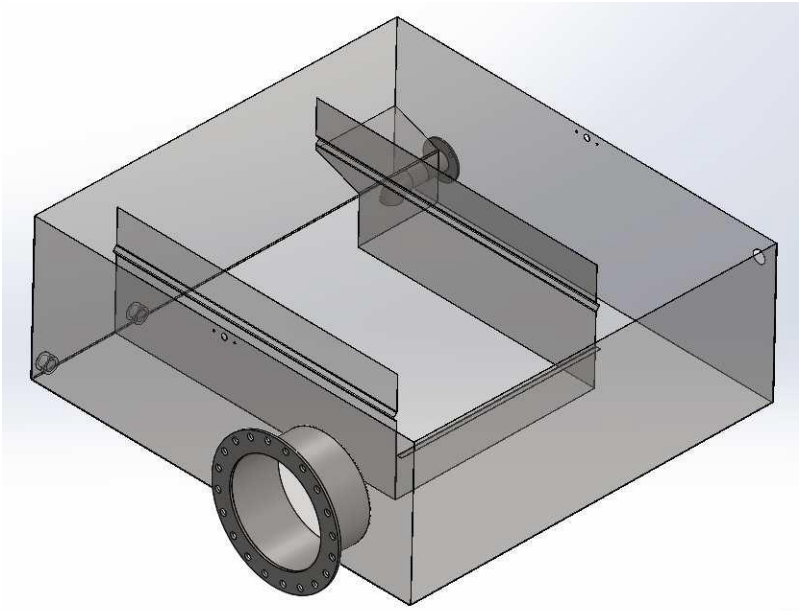
2. If the Diamond filter is kept below the ground level, then the influent can be sent in to the machine by gravity and the machine can be placed in to a concrete tank provided by the customer.

Construction

Emergency Bypass

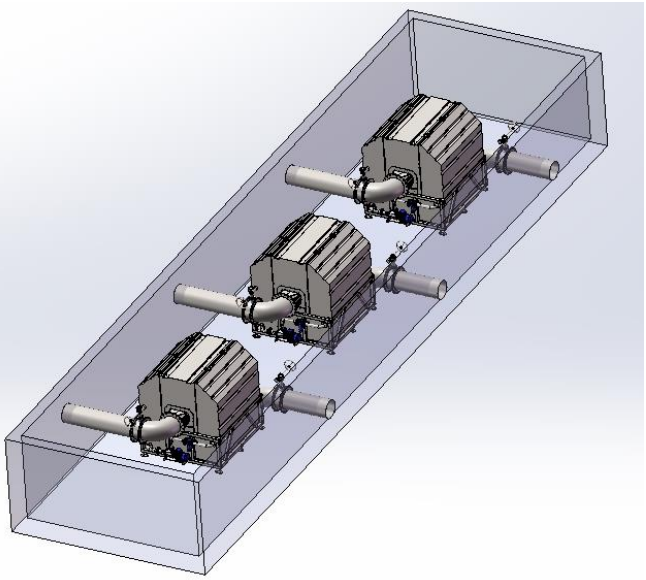


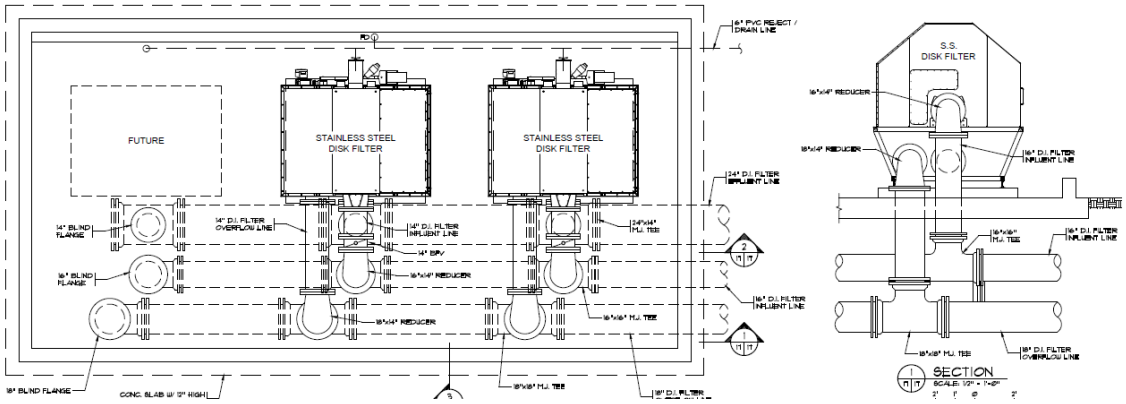
- For the maintenance purpose it is essential to provide for manual bypass of filtrate.
- Provision is made to separate bypass from filtrate inside the machine to protect the wash water pump.

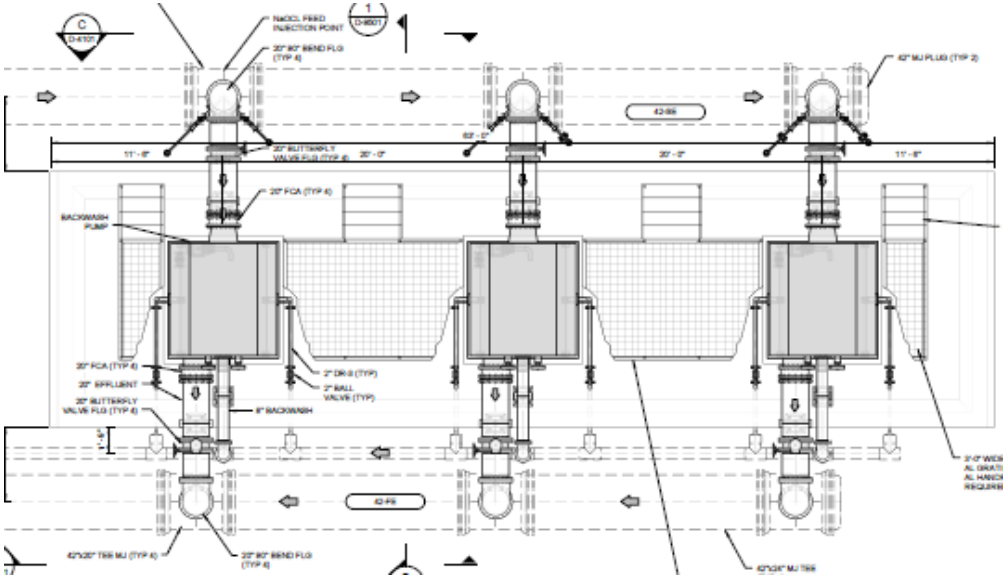


Construction:

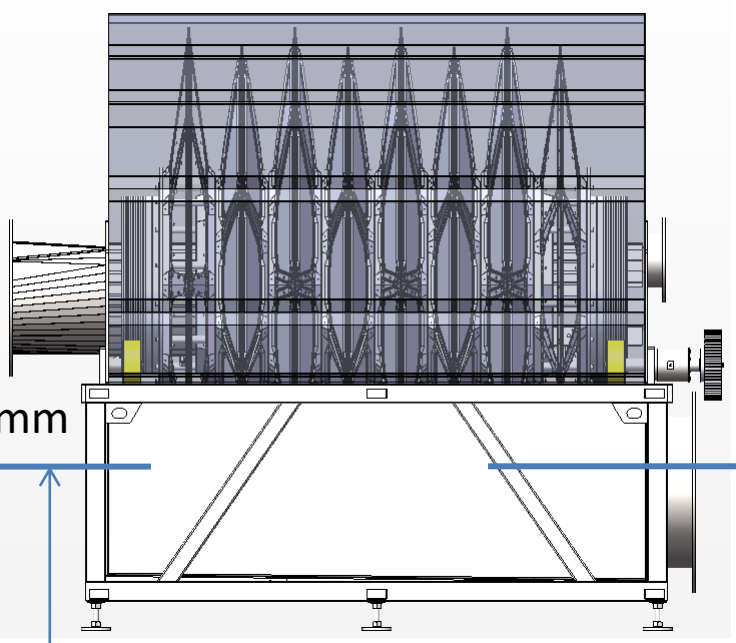
Different Layout Examples







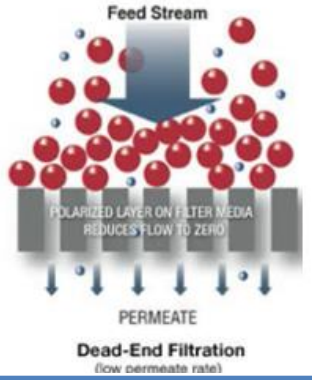
Hydraulic Profile:

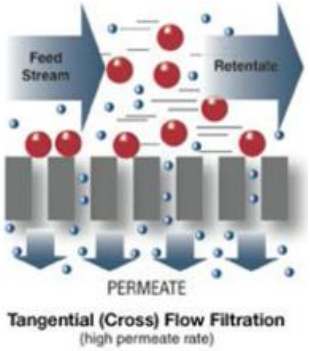


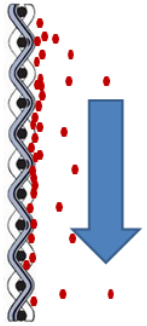
Headloss: 800-1000mm

1. Static filtration v/s Dynamic filtration

Advantages:



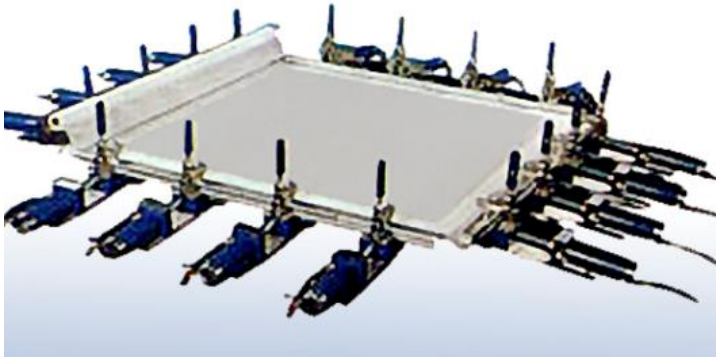




Static Filtration	Dynamic Filtration
Lower throughputs due to: • **Low rotational speed-up to 3 rpm,** • **Rotation during back wash only.** • **Lower renewed filter area / second**	**Very high throughputs (Up to 2.5 times) due to:** • **Higher the rotational speed- Up to 12 rpm,** • **Continuous rotation** • **Higher renewed filter area-1.02 m2 / second.**
Higher cake layer formation: ↓ filtrate rate, ↑ thickness of the cake	**Lower cake layer formation**: ↑ fitrate rate ↓ thickness of the cake
High space requirements	**Low space requirements**

2. Stainless steel Mesh

Advantages



Mesh is tensioned before it is fixed on the filter panel

Polyester mesh has following disadvantages:

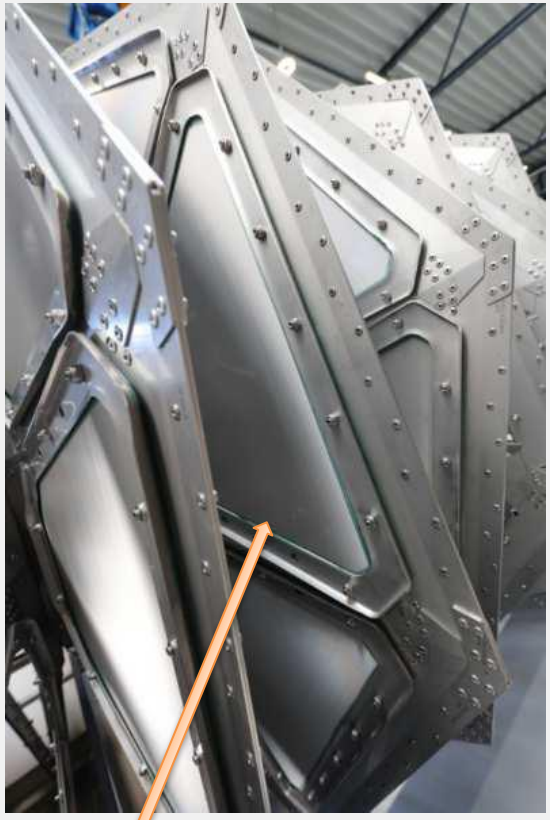
* Due to its high elongation property, when streched, the opening size of the mesh increases by at least 10%. In case of stainless steel, the nopening size of the mesh remains same.

** Due to moisture absorption and aging property, the openeing size increases during the operation.

	Stainless Steel	Polyester
Material of Construction	SS 316	PETP
Force	19N/mm	8N/mm
Elongation %	≈0%	>10% *
Moisture absorption at 20°C	0%	0.4% **
Stability to light	Very high	Poor
Ageing process	No	Yes
Abrasion resistance	Very high	Limited
Hydrolysis resistance	Very high	Limited
Working tension	40 N/cm	20 N/cm
Overall Operating life	Very long	Shorter

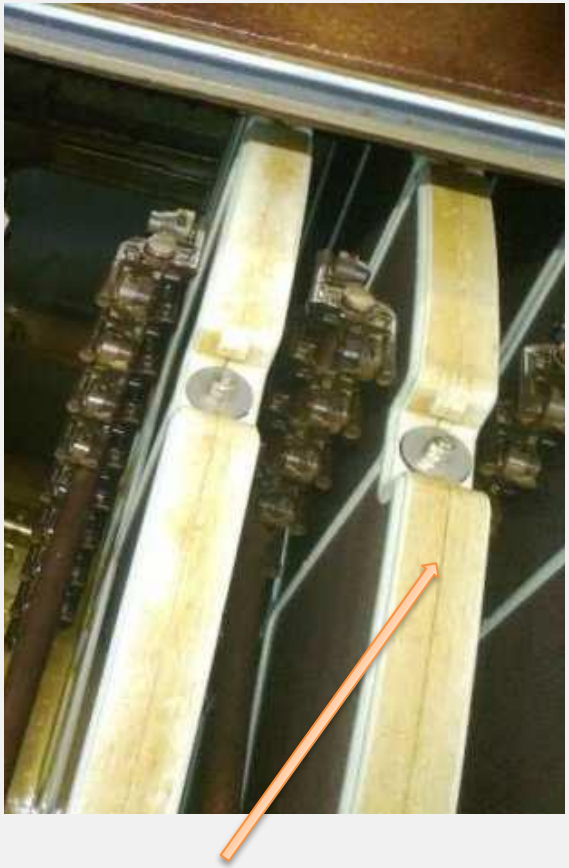
Advantages:

3. Filter Panel



Mesh is fixed to individual filter panel:

When damaged, only Individual panel needs to be replaced

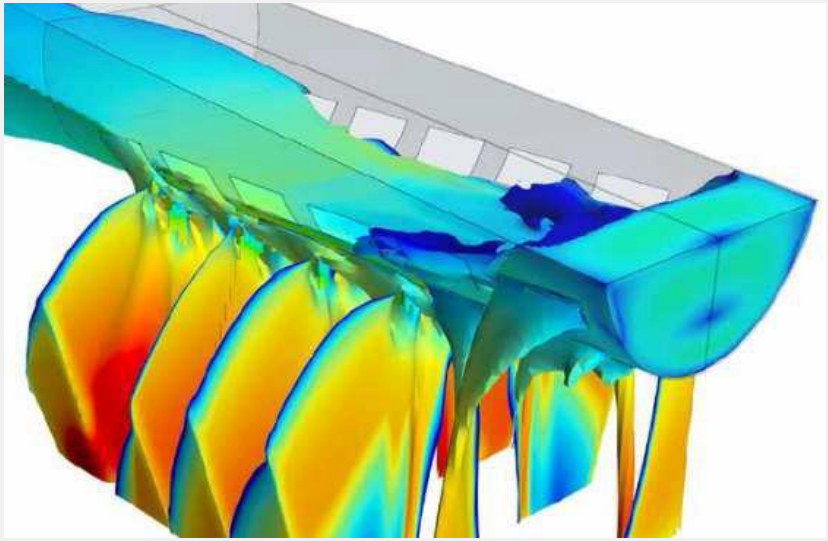


Mesh is fixed to each segment:

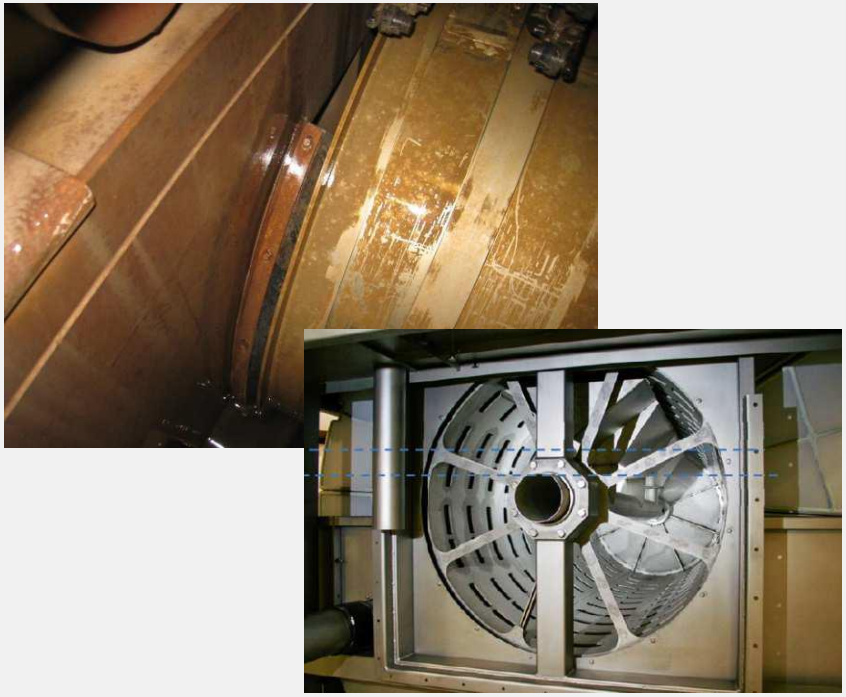
When damaged, whole segment needs to be replaced

Advantages:

4. Inlet System



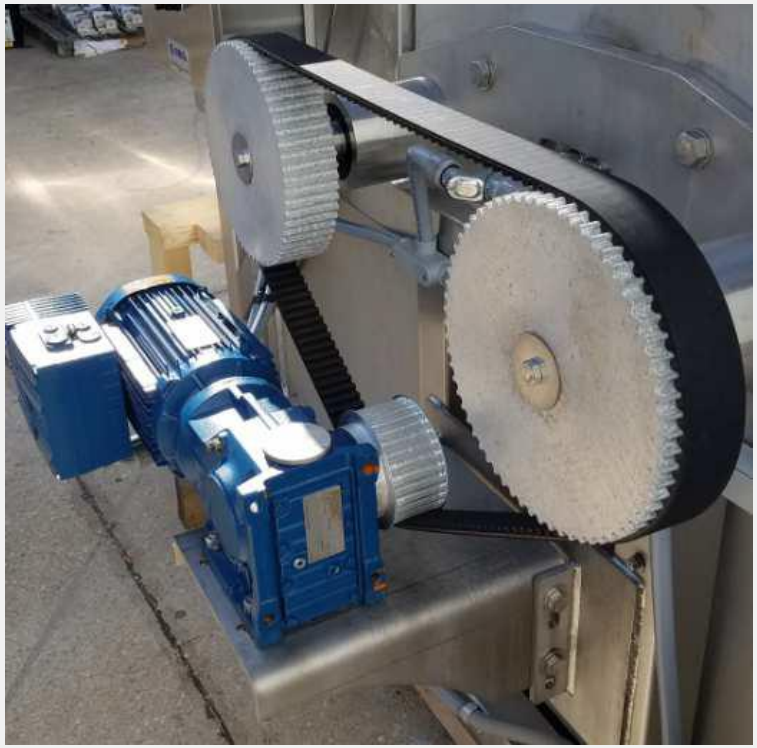
- *No sealing necessary*
- *Minimal wear and leakage even after long operation.*
- *Ensures equal distribution of wastewater to each individual filter wheels*



- *Large inlet sealing necessary*
- *Wear and leakage after some time of operation*
- *Expensive center drum with high inlet cross section.*

Advantages:

5. Drive Mechanism

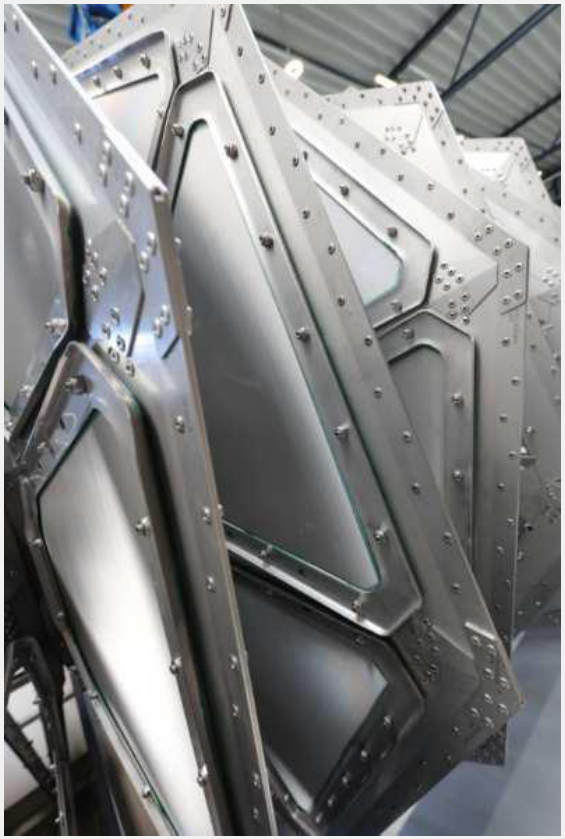


- ***Timing belt installed outside of the machine away from aggressive environment***

- ***Timing belt installed inside tank in the aggressive environment***

Advantages:

6. Filter cleaning



Can be cleaned with chemicals without removing the filter panels

In case of cloth material, segment needs to be dismounted and then cleaned with spray water

Technical superiority over others:

	iFILT®	OTHERS
Rotation of Filter Wheel	Continous	Only during Back wash
Rotational speed	Up to 12 rpm	Up to 3 rpm
Use of filter area	Optimal	Sub optimal due to low speed
Filter mesh MOC	SS 316	Polyester / Cloth material
Leakage due to wearing of Inlet & Outlet sealing	No	High possibility
Expensive Center drum	No	Yes
Drive belt	Outside away from aggressive environment	Inside in the aggressive environment
Foot print	Small	Large

Technical Data

Pore size	10-100 µm
Filter wheel Diameter	2100 mm
Number of Filter wheels	Up to 16 wheels per machine
Hydraulic Performance	Up to 2500 m3/hr per machine
Discharge Quality	TSS discharge concentration of ≤ 5 can be achieved

Specification Of The iFILT Machines:

Model	No of Filter wheels	Approx. Throughput in MLD	Approx. Dimensions (LxWxH) In mtrs	Approx. Wt. (in Kgs)	No of Rotors per machine
12101	1	04.50	1.50x2.30x2.55	850	1
12102	2	09.00	1.75x2.30x2.55	1000	1
12103	3	13.63	1.90x2.30x2.55	1200	1
12104	4	18.20	2.55x2.30x2.55	1850	1
12105	5	23.00	2.80x2.30x2.55	2100	1
12106	6	27.50	3.05x2.30x2.55	2400	1
12107	7	32.00	3.30x2.30x2.55	2750	1
12108	8	36.50	3.55x2.30x2.55	3150	1
22112	12	55.00	3.18x4.30x2.55	4800	2
22116	16	73.00	3.70x4.30x2.55	6000	2

Thank You …