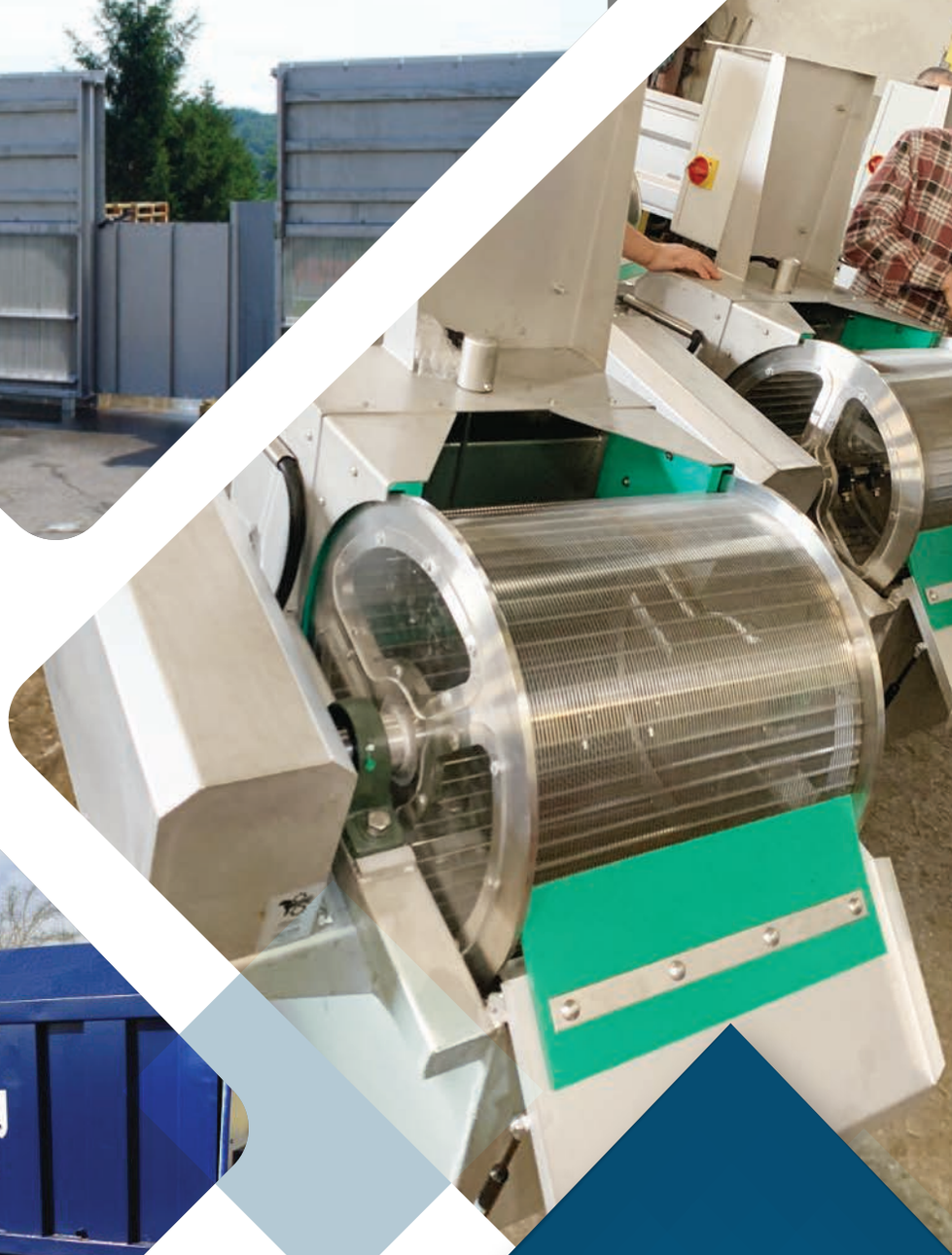


WASTEWATER TREATMENT SYSTEMS

PMC Engineering

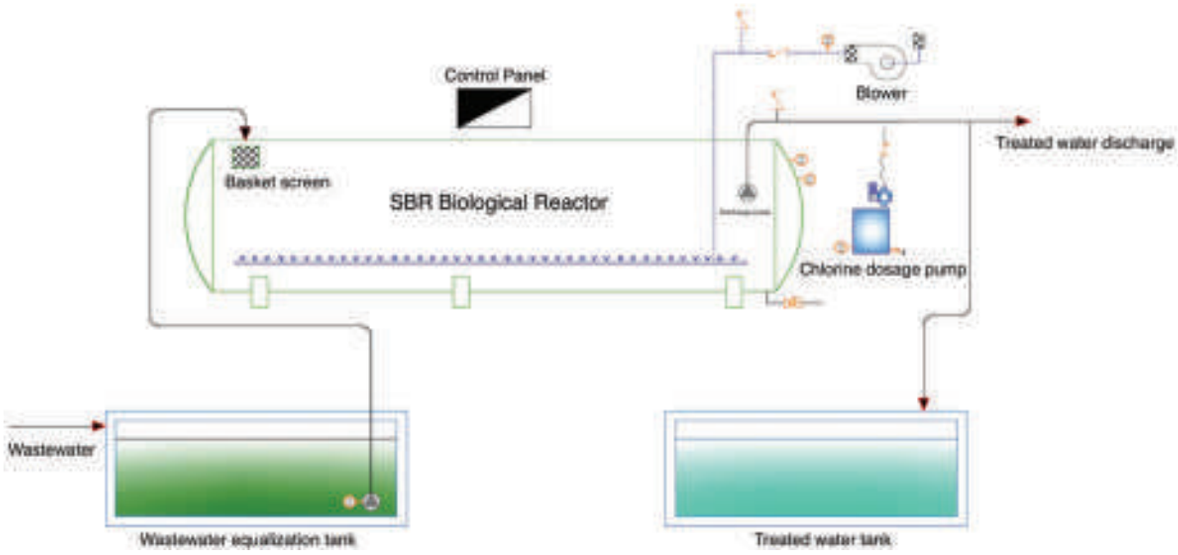
YOUR RELIABLE BUSINESS PARTNER

- SBR
- MBR
- MBBR

COMPACT WASTEWATER TREATMENT SYSTEMS

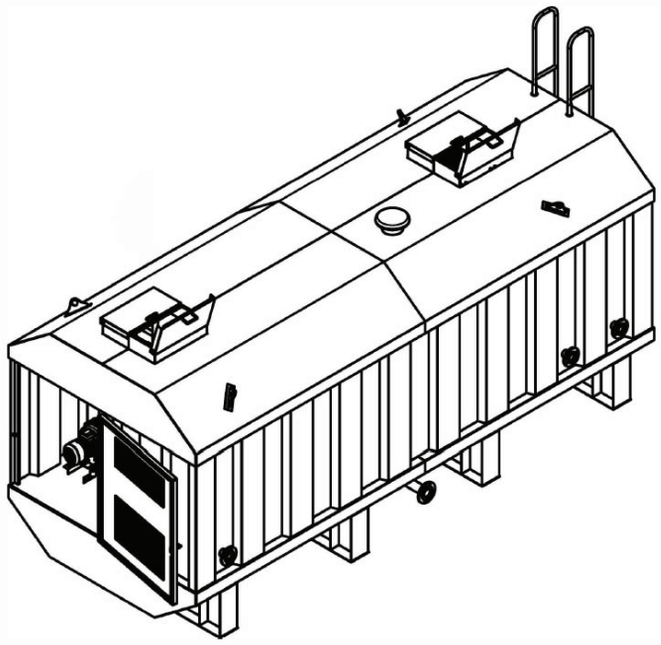
SBR

PMC's Sequencing Batch Reactor "SBR" System is a biological treatment technology developed to treat domestic wastewater. This system has several advantages compared to traditional methods by using a sequencing batch reactor where aeration and sedimentation take place in the same tank. PMC SBR systems operate automatically with minimum intervention requirement.



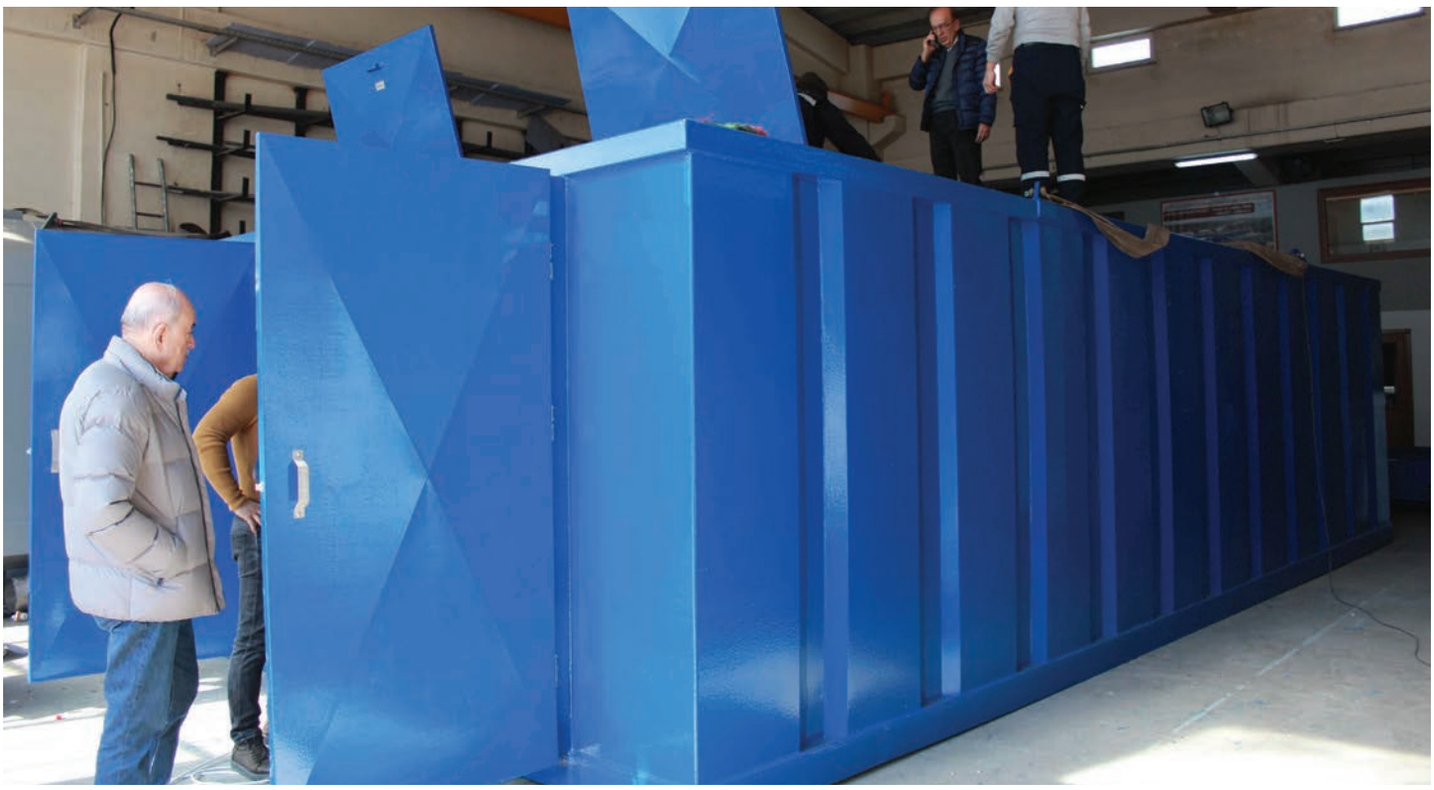
Operation:

- The wastewater goes through a fine screen to remove any trash or material.
- It enters the biological reactor where aerobic bacteria convert organic pollution into CO2 and water. The air required for this process is provided by blowers and distributed through the tank using rubber membrane diffusers.
- Once the organic pollutants are cleared, the water is left for sedimentation.
- Then, it is transferred to the receiving environment using a submersible pump and dosing system for disinfection.
- Sludge formed during the process can be discharged periodically with a mobile vehicle or stored in a storage basin.



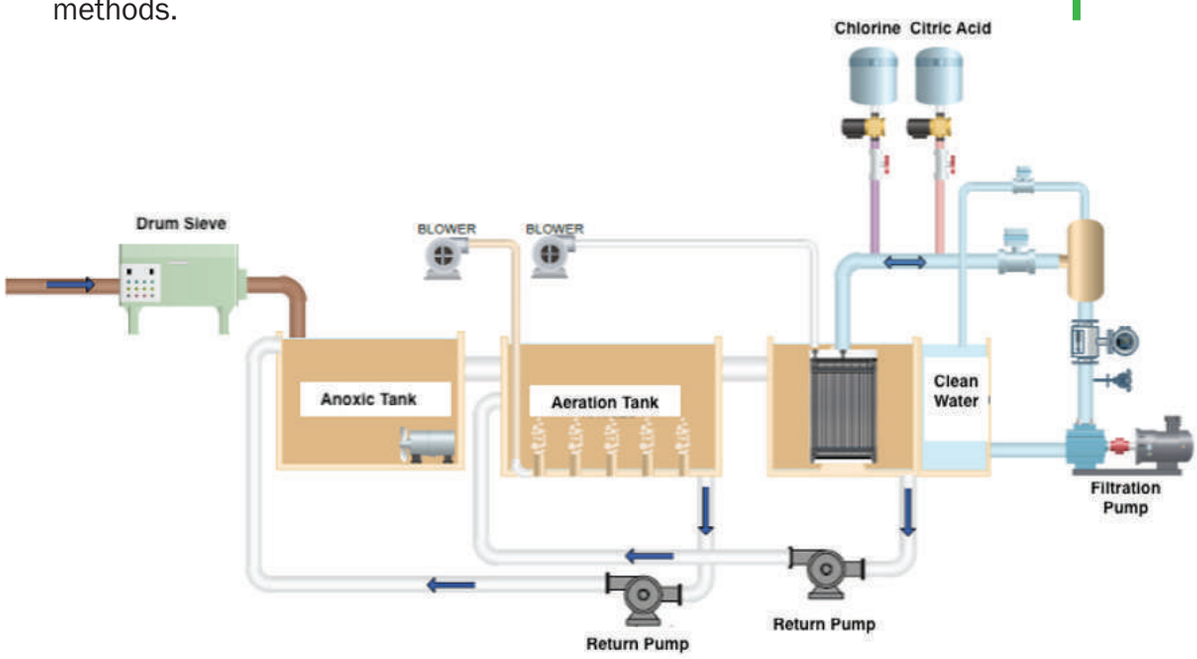
Features & Structure:

- Treated water quality BOD<25 ,COD<50, TSS<25 that allows safe uses for the environment such as horticulture, gardening and industrial applications
- Nitrogen, Phosphorous and high organic load removal preventing the treated water from algae and contamination
- 50 % Reduction in power consumption, land requirements and man power compared to conventional activated sludge treatment methods
- Up to 200 m3/day capacity in a single container
- Minimum of 300 micron electrostatically painted epoxy coating on sandblasted St-37 tank
- Low investment and operating cost



MBR

PMC MBR process combines biological treatment and membrane filtration, ideal for treating domestic or industrial wastewater. Unlike conventional systems, membrane modules separate sludge from water. The biological treatment biomass passes through the membrane filter, producing purified water that has higher purity than other activated sludge treatment methods.



Operation:

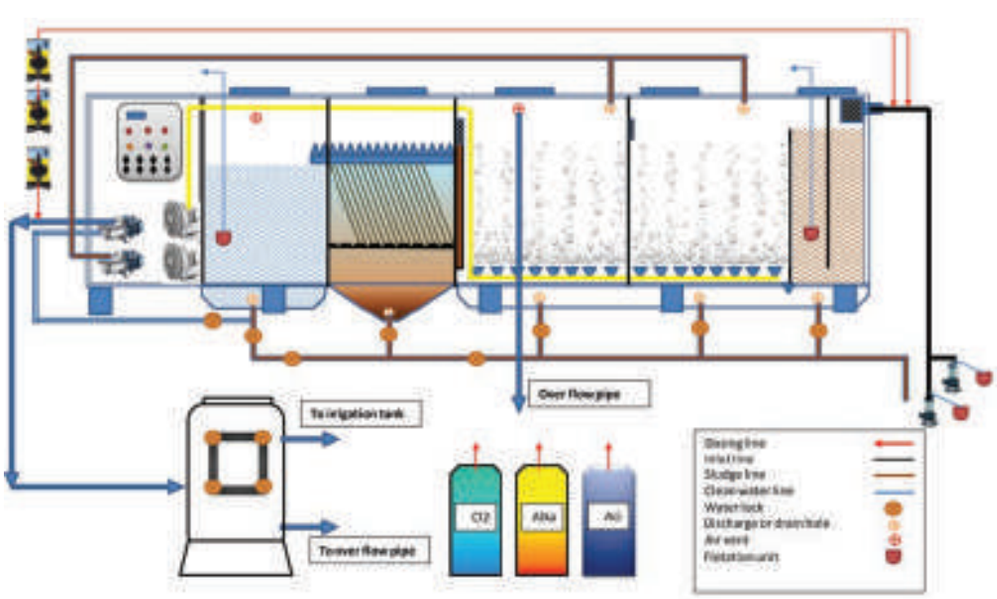
- The sewage is gone through a screen that removes large and free-floating particles to prevent clogging in the system.
- It is then mixed with air bubbles in an air diffusion system for degradation of organic pollutants.
- An air blower provides the bacteria with oxygen for further oxygenation that also serves to clean the membrane modules.
- Filtration is performed by a vacuum pump drawing penetrated water directly from the MBR modules, resulting in purified effluent water.

Features & Structure:

- 3 times lower tank size requirements via unique tank design and ability to maintains up to 8000 mg/l of MLSS inside the reactor
- 90-95% COD removal, 99% BOD removal, and 99% TSS removal, depending on the dissolved inert COD fraction
- Permeate water with a turbidity of 1.0 NTU
- 0.04 pore diameter on the surface of unbreakable reinforced PVDF hallow fiber polymer coated with100 micron textile
- 20% lower energy and air requirement with low pressure
- Minimum cost in operation and sludge management processes

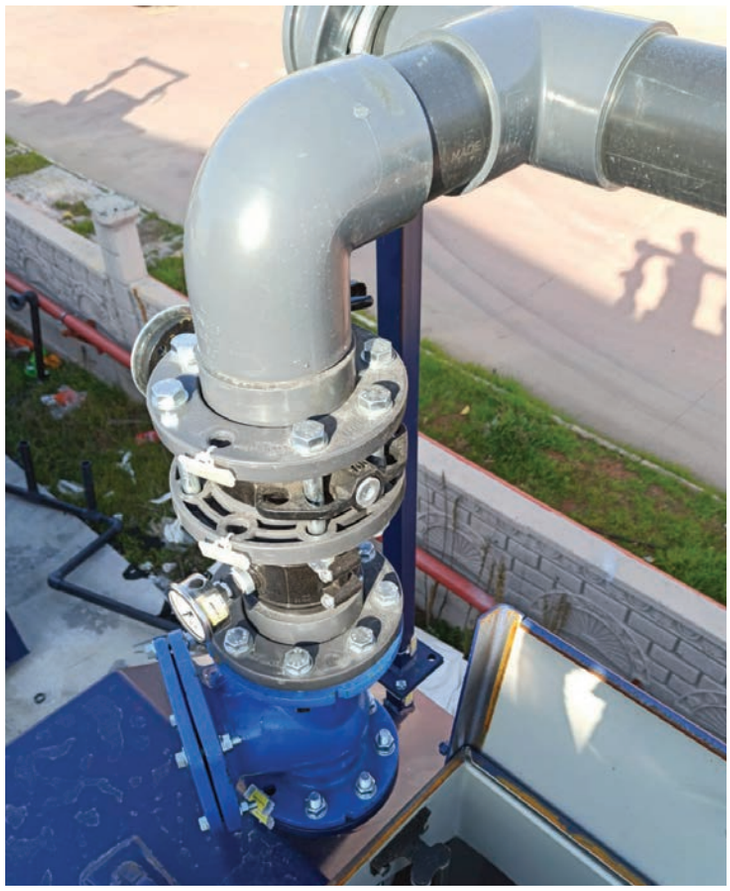
MBBR

PMC uses Moving Bed Bioreactor (MBBR)/ Integrated Fixed-Film Activated Sludge (IFAS) application that involves creating a suspension of plastic media in an aeration tank, which is continuously agitated by bubbles from the aeration system at the bottom of the tank to treat municipal, industrial and decentralized wastewater. The microorganisms attached to the surface of the media consume organic materials in the wastewater as it passes through the tank providing treated effluent.



Operation:

- Influent is gone through a screen to prevent any clogging.
- It is transferred into basin where the bacteria will become activated.
- Biomass grows on small carrier elements that move along with the water in the reactor caused either by aeration of by a mechanical stirrer in the anoxic/anaerobic version.
- Nitrification can be added to the process where needed by adding volume to the reactor by either or combination of pre-nitrification and post-nitrification processes.
- Treated water can be transferred by suitable pump to continue to tertiary treatment system



Features & Structure:

- MBBR/IFAS media with active surface area of over 4500 m2/m3 and diffusion depth of 0.5 mm which is up to 6 times greater than any competing media available
- Smaller tank size and transportation volume due to high active surface area of the media that fits 66 m3 in one 40ft container
- Profound MBBR process know-how
- Treated water quality of BOD<25 ,COD<125, TSS<25 and free from ammonia, phosphorous and other organic substances
- Lower mixing energy and installation work on small footprint thanks to the reduced tank size

COMPACT PRE-TREATMENT SYSTEMS

PMC Compact Pre-Treatment Systems use a combined mechanical pre-treatment process that allows the entire treatment plant and subsequent processes to operate in a preserved, reliable, and proper way. With such process, it is ensured that the downstream treatment is not overloaded by the wastewater. The compact mechanical pre-treatment unit can include an external flow rotating drum screen, a screw screen,additional screenings treatment equipment, grit traps, and grease traps.

Operation:

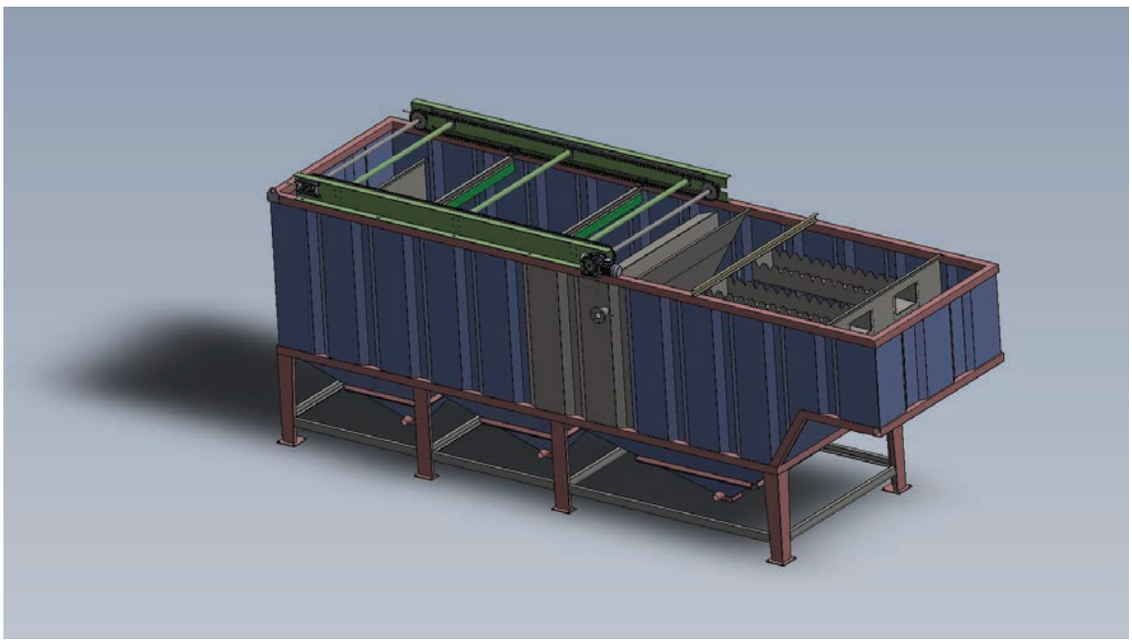
- Wastewater enters the tank and coarse materials are filtered and moved for discharge.
- Less coarse materials flow down to the sedimentation tank.
- All solid discharge is pressed by a compaction unit, then discharged.
- Fats are floating particles are discharged by aeration if present.

Features & Structure:

- 1 to 10 mm screen spacing for equipment protection
- Decanting 95% of sand particles to below 200-250 µm
- Automated removal of fats and floating particles
- Reduction in the amount of solids by up to 35%
- Capacity of up to 210 l/s with small space requirement and modular design

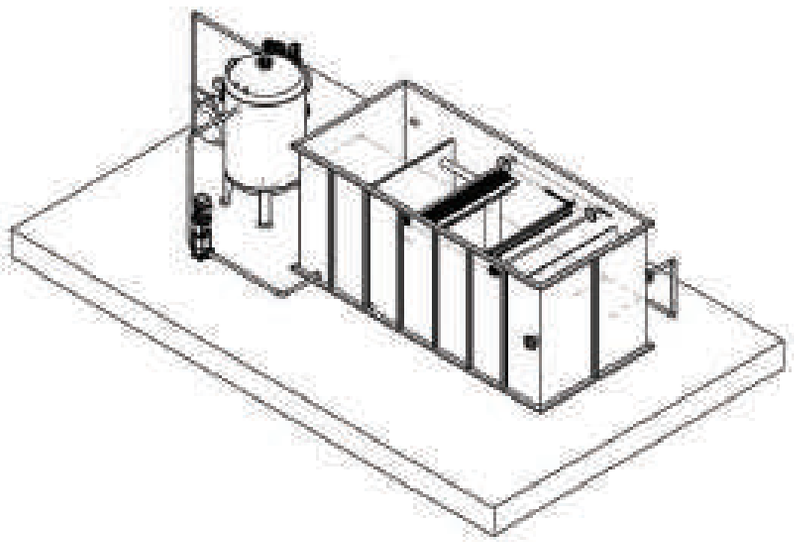
DAF SYSTEMS

PMC DAF units remove the pollutants from the wastewater using the help of appropriate coagulant and flocculant chemicals and scraper system. System features and advantages are ensured even in high capacities through the choice of latest technology providing high ratio of dissolved air in an automated system.



Operation:

- Wastewater is pumped from the equalization tank to the flocculator where chemical dosing is performed.
- It is then transferred to the DAF system where part of the water is mixed with air and returned to the system to mix with incoming wastewater.
- When pressure is lifted, present air bubbles dissolve in the mixing chamber, clinging oil, grease and suspended solids.
- Pollutants rising to the surface of the tank are scraped via scraper.



Features & Structure:

- > 90 % saturation efficiency
- Use of quality driven equipment to ensure >98 of the air injected is dissolved
- No excess number of air relief valves in present in the equipment
- Ideal to meet the 100 mg/L discharge limit of oil and grease
- Up to 4%TS sludge content diminishing to a much lower sludge volume
- Design capacity up to 500 m3/hr

PENSTOCKS

PMC Penstocks are designed to regulate, isolate, divide or control the level of water flow serving as valves very commonly serving in wastewater plants, sewage treatment plants and various process plants.

PMC designs, manufactures, and supplies penstocks of high quality, performance and craftsmanship tailored to meet custom requirements, specifications, conditions and preferences.

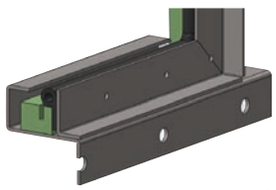


Fig.1 EPDM Sealing

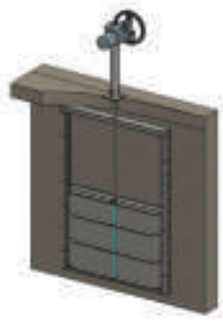


Fig.2 Penstock With Electric Actuator

Fig.3 Manual Operated Penstock with Non-Rising Stem

Fig.4 Double Shaft Manual Operated Penstock with Reducer

Installation

A) Wall mounted

- Self-supporting flanges in the back of the chassis to be installed on a concrete wall.
- 4 side sealings
- Single or double spindle
- Easy replace

B) Channel Mounted

U-shape chassis to be installed in the rebates formed on a concrete channel

- 3 side sealings
- Single or double spindle
- Easy replace

Pressure

A) On Seating

Water presses on the penstock against the wall.

B) Off Seating

Water presses on the penstock away from the wall.

C) On/Off Seating

Water presses on the penstock from both directions

Stem

Rising Stem

The screwed stem rises or lowers together with the penstock and is not subject to immersion.

Non-Rising Stem

The screwed stem does not rise or lower with the penstock due to the threaded stem nut fitted in the penstock and is subject to immersion.

Oparation

A) Manual Operation

Manual operation is preferred where the requirement of frequency and the torque to operate the penstock are low and time for operation is slow. A reduction drive can be added to manual penstocks on request.

B) Automatic Operation

Automatic operation is preferred where the requirement of frequency and the torque are high, and time for operation is fast.

Features

- Easy assembly, compact and custom design
- Sealing according to BS 7775, AWWA and DIN 19569 standards
- Constructed in accordance with EN 1090 and machine directive 2006/42/EG
- Trapezoidal thread spindle
- Availability of rust and acid resistant materials
- Spindle nut made with corrosion-resistant alloy to allow easy sliding
- Easy service and maintenance thanks to replaceable sealing

MULTI-RAKE MECHANICAL BAR SCREEN

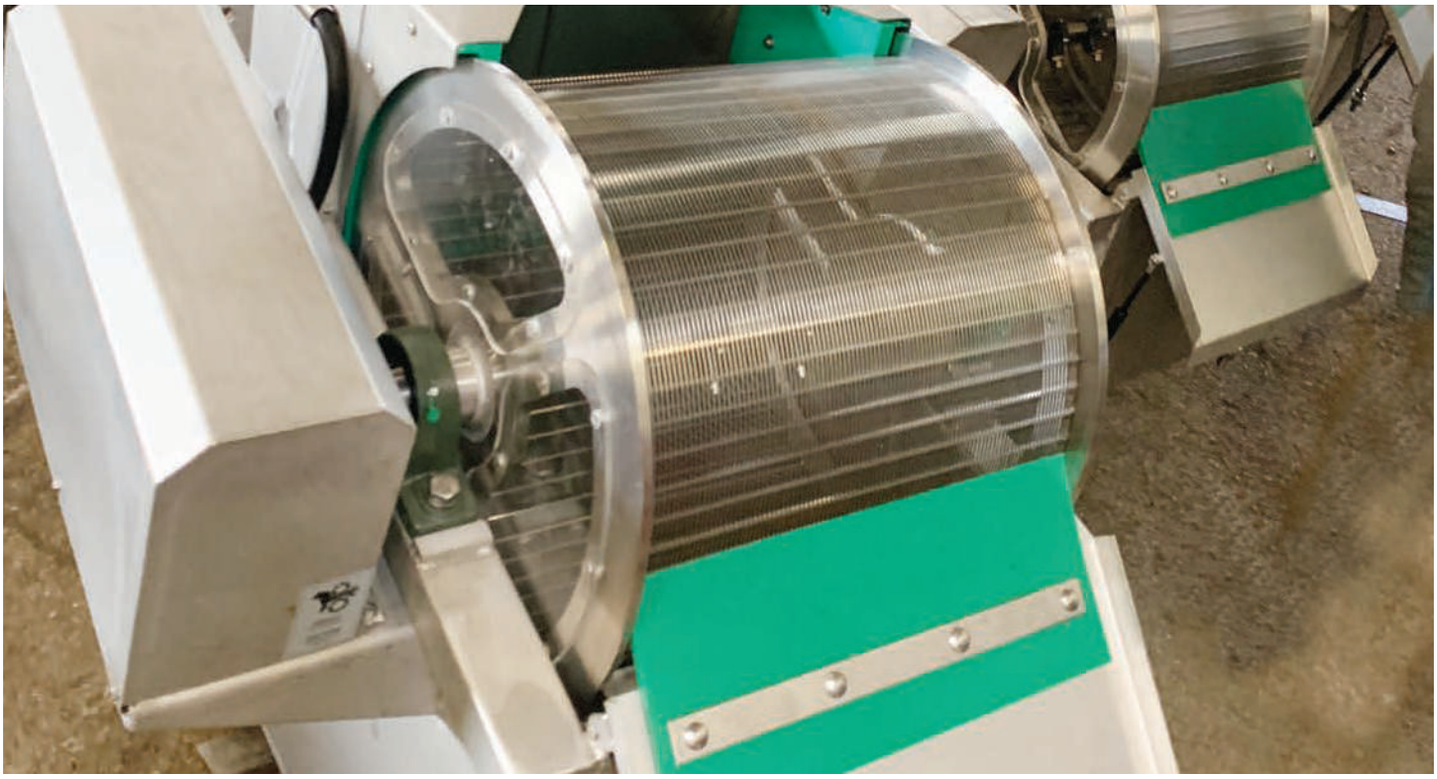
PMC Multi-Rake Mechanical Bar Screens screens are designed and manufactured for all kinds of medium to large-sized water and wastewater treatment plants as well as pumping stations. Multiple mounted rakes clean the stationary bars which reduces the time to clean the bar screen. PMC multirake mechanical bar screens are ideal for reaching high waste discharge capacities in a short cycle time.

Operation:

- The water flows through the bar screen. Solid wastes are captured by the bars of screen.
- When solid wastes accumulated and the stream reach the limit, cleaning mechanism is activated.
- The drive belts, mounted on the sides of the equipment convert radial movement into linear movement and transfer the movement to the rakes.
- A gear motor connected to the drive shaft move the rakes. The rotational motion is converted into guided movement of the chain.
- The screenings are then discharged.

Features & Structure:

- A stable, solid structure that can adapt to new or existing channels
- High retention and removal of solids
- Attachable to the channel by placing across the channel with the help of lateral supports
- Low energy consumption
- Up to 4.000 mm channel width and up to 20 m discharge height above channel floor
- Installation angle from 50° – 85°



ROTARY DRUM SCREEN

PMC Rotary Drum Screen is a fine screen used for capturing suspended solids in water. It has very few moving parts. It consists of rotating drum, made of trapezoidal stainless steel bars or wedge wire mounted on a horizontal shaft and rotates at a slow speed, motor-reducer and a carrier chassis.

Operation:

- Wastewater entering the drum screen with flanged connection is poured evenly on the outer surface of the drum screen's sieve.
- The water passing through the sieve opening to the lower part of the drum is discharged.
- Suspended solids in water are kept on the sieve and poured into the discharge section with the help of the scraper in front with the rotational movement of the drum.
- Wastes remaining on the outer surface of the drum is cleaned by the powerful pressurized water sprayers inside the drum.

Features & Structure:

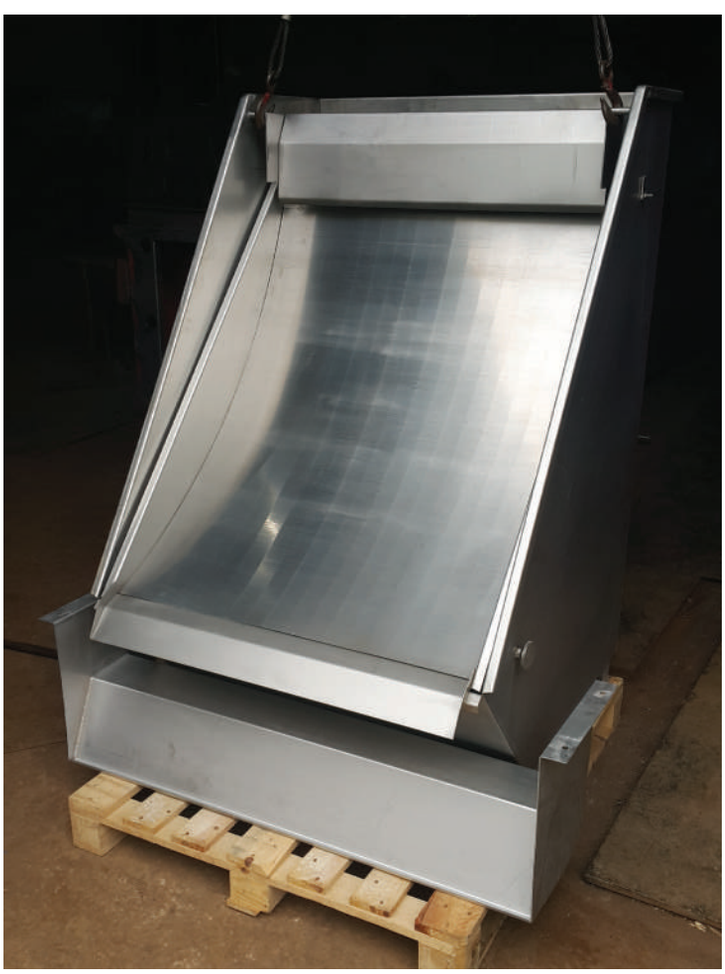
- Heavy loading
- Fine screening
- Self-cleaning
- No risk of clogging or blockage in the drums screen
- Hydraulic capacity that can be increased with a minimal pressure drop

STATIC SCREEN

PMC Static Screens use a laminar, high-performance screening principle for the separation of solids from liquids based on the Coanda effect. The shape of the bars with sloping sections on the screen are unique, retaining the solids larger than the spacing.

Operation:

- Influent overflows and passes onto the screen.
- Screen consists of triangular corrugated laminar bars that have sloping ramps in different angles giving the screen's bars its unique design .
- Bottom part receives the filtered wastewater where gravity draws it out through the outlet flange.

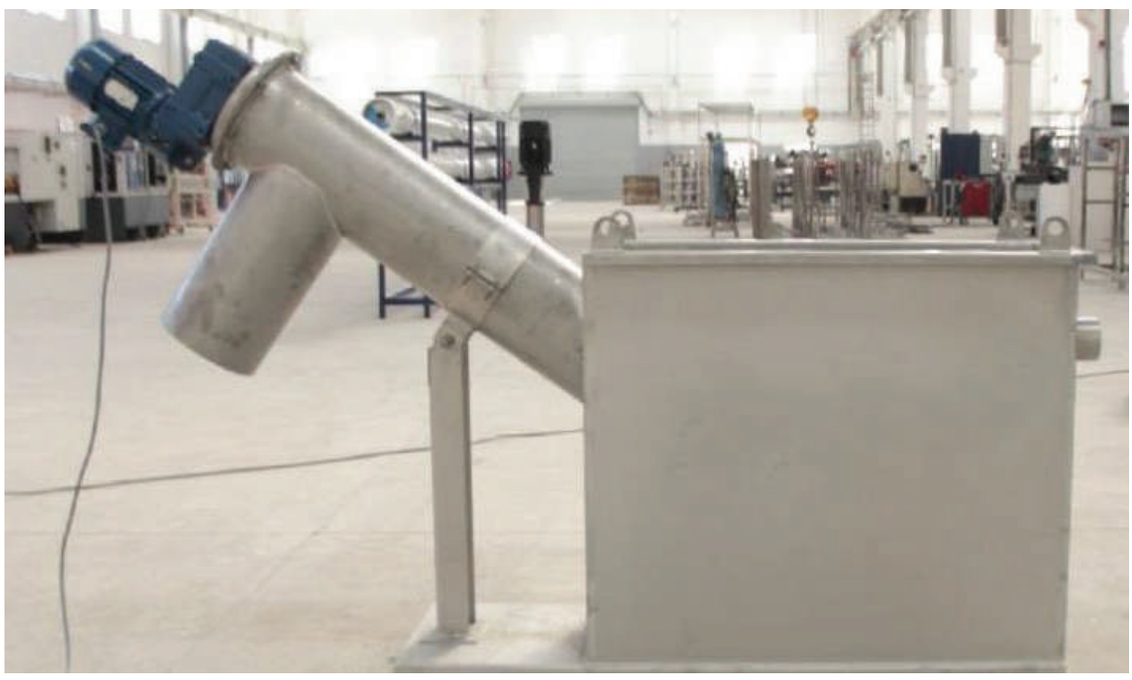


Features & Structure:

- No moving parts or motor
- Zero to minimum costs of maintenance
- Unique design of sloping screen bars helping large load of wastewater to be treated
- Strong welded structure helping the equipment to last
- Silent operation

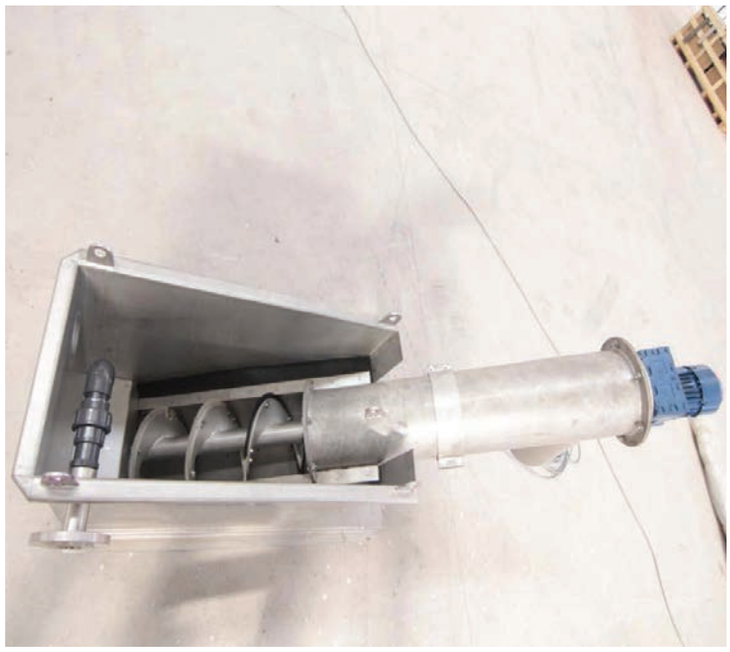
SCREW SCREEN

Ideal for narrow channels, pipelines, and in compact units, PMC Screw Screens remove solid wastes and dewatering of the treatment process.
For larger capacities, the traditional screen can be replaced with a rotary drum screen to satisfy the process Vin high flow rates.
The screen filters can be manufactured as wedge wire or perforated. The mechanism can be level-controlled, time-controlled or both.



Operation:

- The wastewater enters through the screen. Solid materials are filtered and held at the interior of the screen.
- Accumulation of solid particles and clogging on the inner surface of the screen activate the cleaning system.
- Low-rev gear motor begins operating and the screw begins to transport and to lift the waste.
- Screened solids are moved, washed and compacted by the screw, then discharged via chute.



Features & Structure:

- Installation angle up to 45°
- Complete stainless steel structure treated with acid bath to minimize corrosion and maintenance requirement
- Up to 3000 mm screen basket diameter
- Fully automatic operation
- Approximately 50% weight reduction of the initial contents
- Up to 40 % DS dewatering performance
- Up to 20% capacity increase with use of perforated screen
- Outdoor installation

SCREW CONVEYORS

PMC Screw Conveyors offer economical solution for moving screenings, grit waste sludge and other waste materials. The system is highly preferable compared to belt conveyors for safety, cleanliness and also for compact installations in a reduced space. Depending on the material and particle characteristics the PMC Screw conveyors can be designed and manufactured as:

- with Compactor
- without Compactor

Operation:

- The material is moved by a robust steel spiral equipped with a low-rev gear motor.
- Shaft in contact with the trough, which is protected by a replaceable sleeve.
- Conveyor is filled with material to minimize the wear and tear when operating.
- Conveyor with compactor is fitted with compacting head and drainage sections for decanting the liquids in the solid materials.

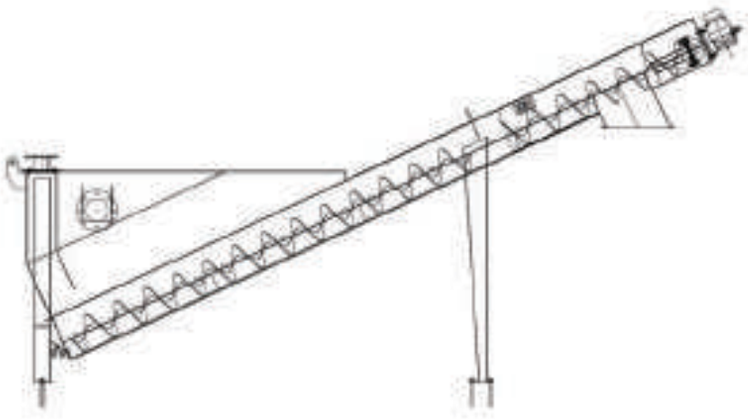
Features & Structure:

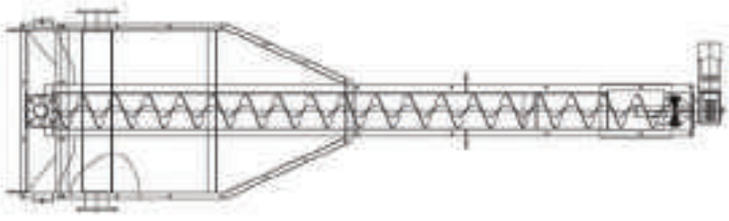
- PE-1000 UHMW (ultrahigh molecular weight polyethylene) or Adiprene sleeves
- Up to 30 m screw length for throughputs from 1 m3/h- 12 m3/h at 45° installation angle
- Installation angle up to 90°
- Equal screw force distribution over a defined cross-section minimizing the maintenance
- No lubrication
- Outdoor installation

GRIT CLASSIFIERS

PMC Grit Clarifiers remove the water from heavy materials such as sand, gravel, mineral particles, and other organic materials with particle sizes larger than 200 microns.

It helps to protect the pumps and other equipment against abrasion by avoiding the accumulation of sediments in channels.





Operation:

- The water/sand mixture is flows into the grit classifier's chamber by either pump or by gravity.
- Rotary motion is induced with the air intake at the chamber.
- Chamber's unique design and the create a laminar flow where solids are deposited at the bottom.
- Solids are lifted by conveyor and removed them from the water, and strained.

Features & Structure:

- 0 clogging risk due to easy removal of floating materials
- Up to 95% grit separation of grain size 0.20-0.25 mm
- Minimized problems of watertightness and seals due to screw operation located at the top
- Minimum maintenance via quick-opening upper cover
- Double-ended support for minimal wear

AERATORS

PMC Aerators are outstanding choices of equipment for in introducing oxygen into;

- Lagoons
- Ponds
- Lakes
- Rivers
- Activated sludge basins
- Equalization tanks
- Oxidation ditches
- Circular tanks

In addition to a fine-bubble deep aeration, PMC Aerators are also used for circulation and thorough mixing of the wastewater.

Operation:

- Atmospheric air is driven through the hollow shaft.
- Air created by the rotating propeller is discharged into the water stream.

Features & Structure:

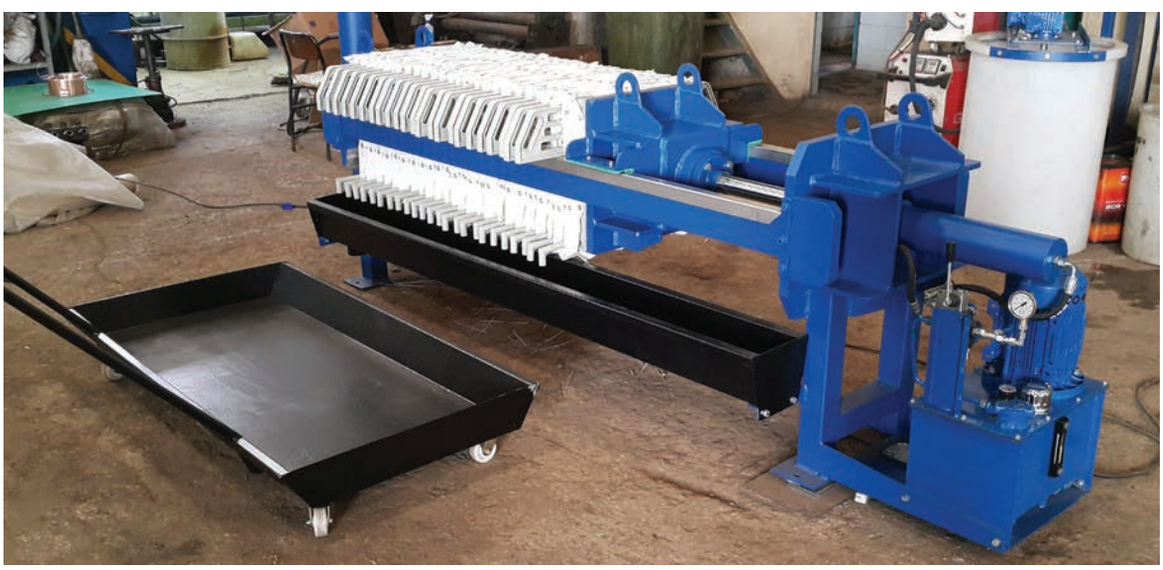
- Up to 39,6 kgO2/kWh oxygen efficiency achieved by sophisticatedly designed propeller
- Made of non-corrosive material with protective housing
- Smooth operation thanks to extruded seamless steel tube with tight production tolerances
- Maintenance free design due to lack of seals or bearings
- No spray of wastewater due to protective housing
- Low weight
- Easy fixing on walls or bridges

FILTER PRESS

PMC's Filter Press is a batch operated, fixed volume process for;

- Purification of raw materials, products and by-products,
- Extraction and recycling of materials, raw materials, solvents and unreacted materials,
- Removal of impurities from sludge and wastewater.

PMC Filter Press is ideal for maximum degree of dewatering especially when it comes to the highest level of filtration efficiency.

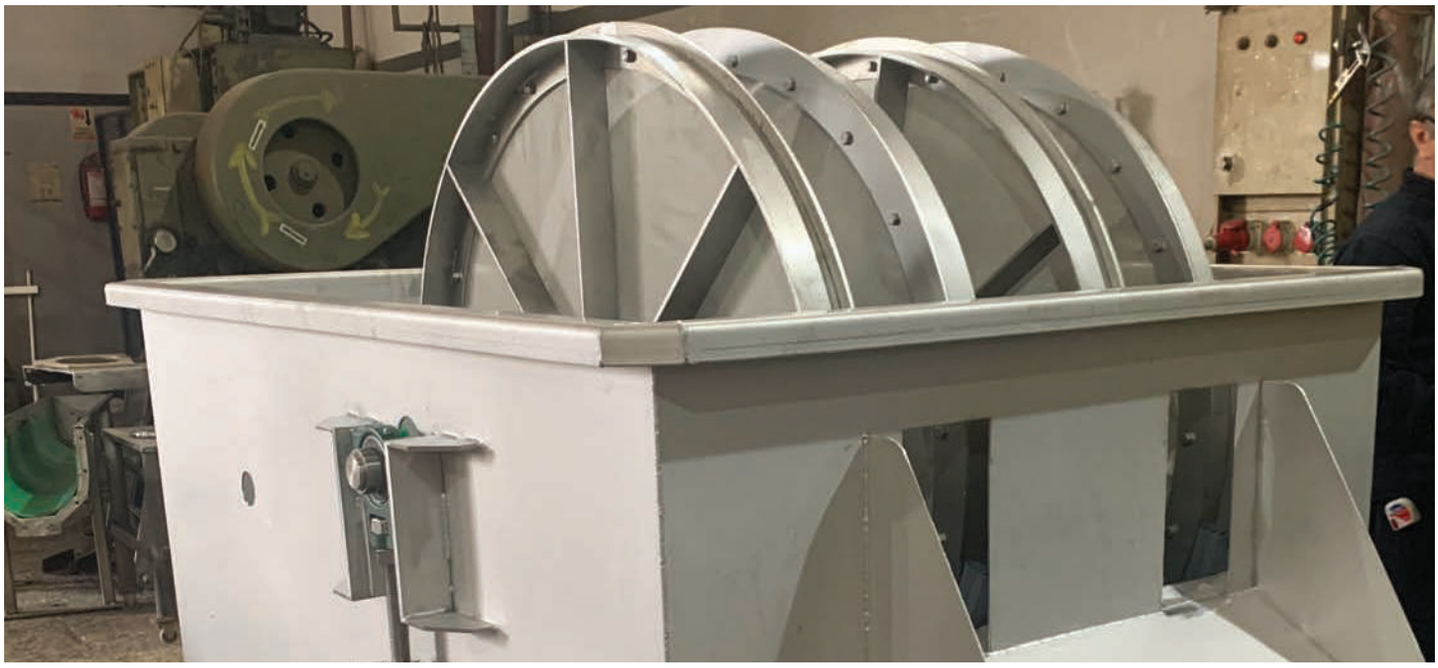


Operation:

- Sludge or influent is pumped into the filter press and begin to build on the filter cloth where filter cake is built.
- Fine particles pass through the cloth until solids form a layer on the filter cloth.
- That layer traps the fine particles and forms a filter cake.
- Pressure is increased as the solids fill the chambers until they are completely full of cake meaning fill cycle is complete.
- Filter cake is discharged as the liquid filtrate exits from the outlet.

Features & Structure:

- Lower than 30% moisture in filter cake
- High solid content
- Minimum flocculant requirement
- High quality, durable plates and filter cloths
- Up to 225 psi dewatering pressures
- Highest amount of recovered water
- Lowest operating cost due to batch operation
- Strong steel frame acting as a clamping device for the filter plates



DISC SCREEN

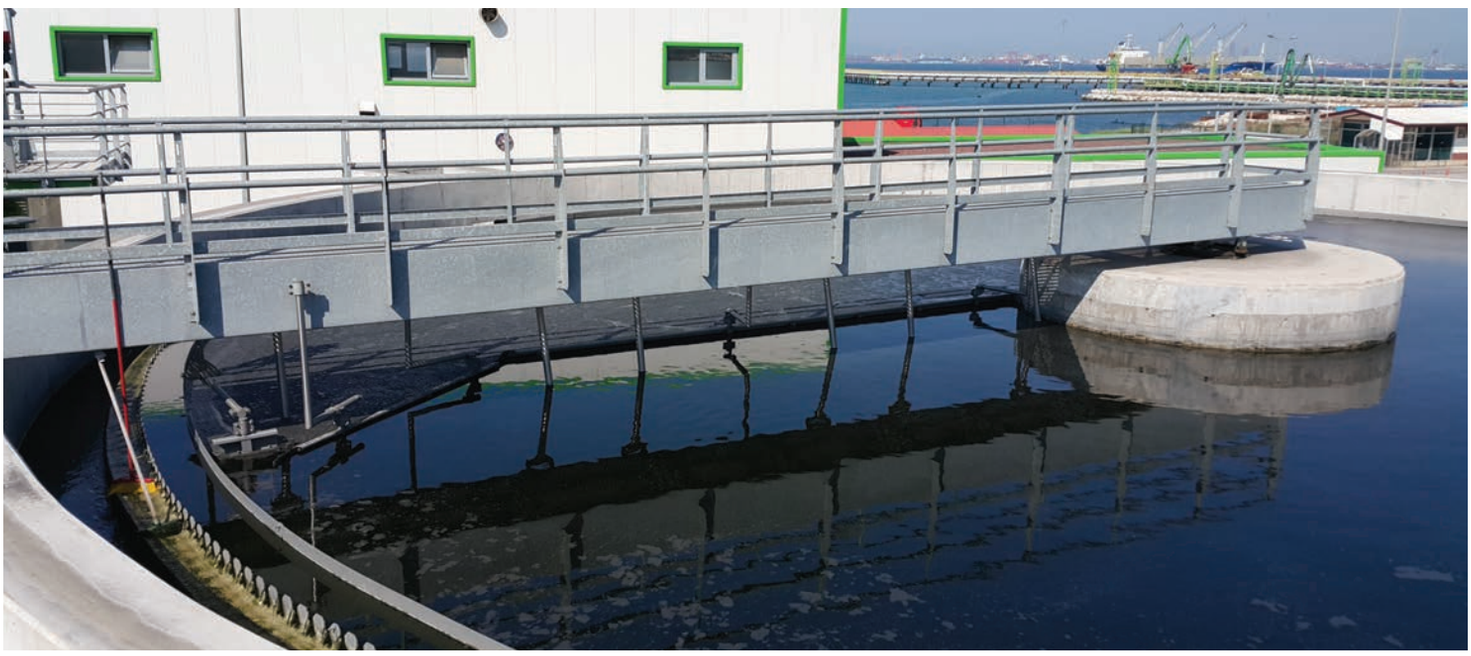
PMC Disc Screens are ideal for high hydraulic loads with space restrictions to achieve reliable solid retention. Equipped with filter mesh discs, PMC Disc Screens offer quick and efficient solution to offer reliable effluent by separating suspended solids from biologically treated wastewater in municipal and industrial applications such as:
Paper & Pulp, plastic processing , food, chemical

Operation:

- The wastewater to be treated flows into the horizontal shaft and from there through openings into the filter discs which the water passes from inside to outside.
- Solids are retained on the inner disc surfaces, which leads to gradual blinding of the mesh
- Water level in the tank rises as the blinding process progresses.
- Solids are removed by the slow rotation of the filter discs as the filtrate through the mesh from inside to outside
- Solids contained are collected in a trough and discharged

Features & Structure:

- Continuous operation
- Small footprint
- No external water supply required for cleaning
- Up to 2000 m3/h capacity per unit
- Up to 35 filter discs per machine
- 10 - 100 µm mesh size



SCRAPERS & THICKENERS

PMC Engineering offers sludge treatment equipment for removal of biological sludge and floating particles in both Primary and Secondary Settling tanks. While chemical and biological sludge in the treated wastewater settles and accumulates at the bottom of the reservoir, the oil and foam accumulate at the surface to be scraped away.

Thickeners can be preferred for circular reservoirs in cases where sludge volume is needed to be reduced due to the restrictions and parameters of the treatment plant.

Operation:

A. Circular Scrapers

Scraper bridge and bottom pallets radially move, transmitting the sludge to the sludge cone in the center of the tank.

There are two types of drive for circular scrapers, depending on the reservoir seize, sludge load and the process.

- Central Driven
- Peripheral Driven

B. Longitudinal Scrapers

- Bridge scraping system can move in two directions along the tank. As the bridge goes from the tank inlet to its exit, the scraper blades are lifted and go back empty. During the movement towards the sludge cones, the blades are lowered to push the sludge towards the cones.

Features & Structure:

- Available for tanks of up to 54 m in diameter
- High corrosion resistance
- High removal efficiency of sludge and floating matter
- Custom designed and manufactured V-notch weir assures uniform laminar flow
- Custom designed and manufactured scum baffle prevents floating matter from reaching the effluent
- Unique design wiper blades
- Low energy consumption
- Thickening performance up to 50% of the sludge volume from concentration level of 0–3% to 3–6%

Vision

Water and wastewater treatment is a vital and meaningful operation. PMC team wholeheartedly takes reducing the level of contaminated water as a responsibility. With respect to such responsibility, profit losses importance. PMC's vision is to serve to earth's water by abandoning a profit centric business approach.

Mission

PMC 's mission is and always will be delivering the highest quality of product and equipment and maintaining the confidence our clients have on us through establishment of 100% transparency, communication and diligence.

Our Values

At PMC, there are no promises unkept. We operate based on a culture built on values that secure reliability and confidence on one another. What makes our family bondage strong also makes our business relations invincible:
Looking after each other. We keep into account our client's best interest because we believe that the most rewarding feeling is to see our clients lean on us.

PMC Engineering

YOUR RELIABLE BUSINESS PARTNER

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