

**IN 31 COUNTRIES
MORE THAN 500
TREATMENT PLANTS**

LET'S **SAVE**
THE WATER
TOGETHER

 **enta**[®] *since 1994*
Treatment Systems

IN **31** COUNTRIES MORE THAN **500** TREATMENT PLANTS

Established in 1994, ENTA has been providing high quality engineering services in 31 countries with more than 500 completed references in water and wastewater treatment plants.

ENTA is active in industrial and domestic wastewater treatment, recycling of wastewaters, drinking water treatment and preparation of specific grade or high-quality process waters.

Industrial wastewater treatment has a unique place in environmental engineering and it has different pollution characteristics for different types of industries.

ENTA has built up several treatment plants for different industrial sectors especially such as organized industrial zones, textiles, petrochemicals, refinery, leather, integrated wood, mining, food, pharmaceuticals, chemicals, detergents, paper and metal plating.



TÜRKİYE



PAKISTAN



AZERBAIJAN



CYPRUS



TURKMENISTAN



ALGERIA



MONGOLIA



REPUBLIC OF
THE CONGO



RUSSIA



ALBANIA



GEORGIA



LEBANON



SYRIA



SUDAN



ETHIOPIA



BANGLADESH





ENTA **DESIGNS&BUILDS:**

1- Domestic Wastewater Treatment Plants

2- Water Treatment Plants

3- Industrial Wastewater Treatment Plants

- Mixed Industrial Zones • Textile • Petrochemical • Integrated Wood
- Food • Chemicals • Leather • Mining • Pharmaceutical • Detergents
- Paper • Metal Plating

4- Wastewater Recycling Plants

ENTA **GIVES SERVICES** for:

5- Design & Consultancy for Treatment Plants

6- Operaton and Maintenance of Treatment Plants



KAZAKHSTAN



IRAN



IRAQ



BULGARIA



ARAP EMIRATES



SEYCHELLES



QATAR



LIBYA



IVORY COAST



EGYPT



GHANA



ROMANIA



UZBEKISTAN



OMAN



MOROCCO



Almost

5 MILLION m³ of WASTEWATER

is recovered annually in the recycling plants built up by **ENTA** all over the world.

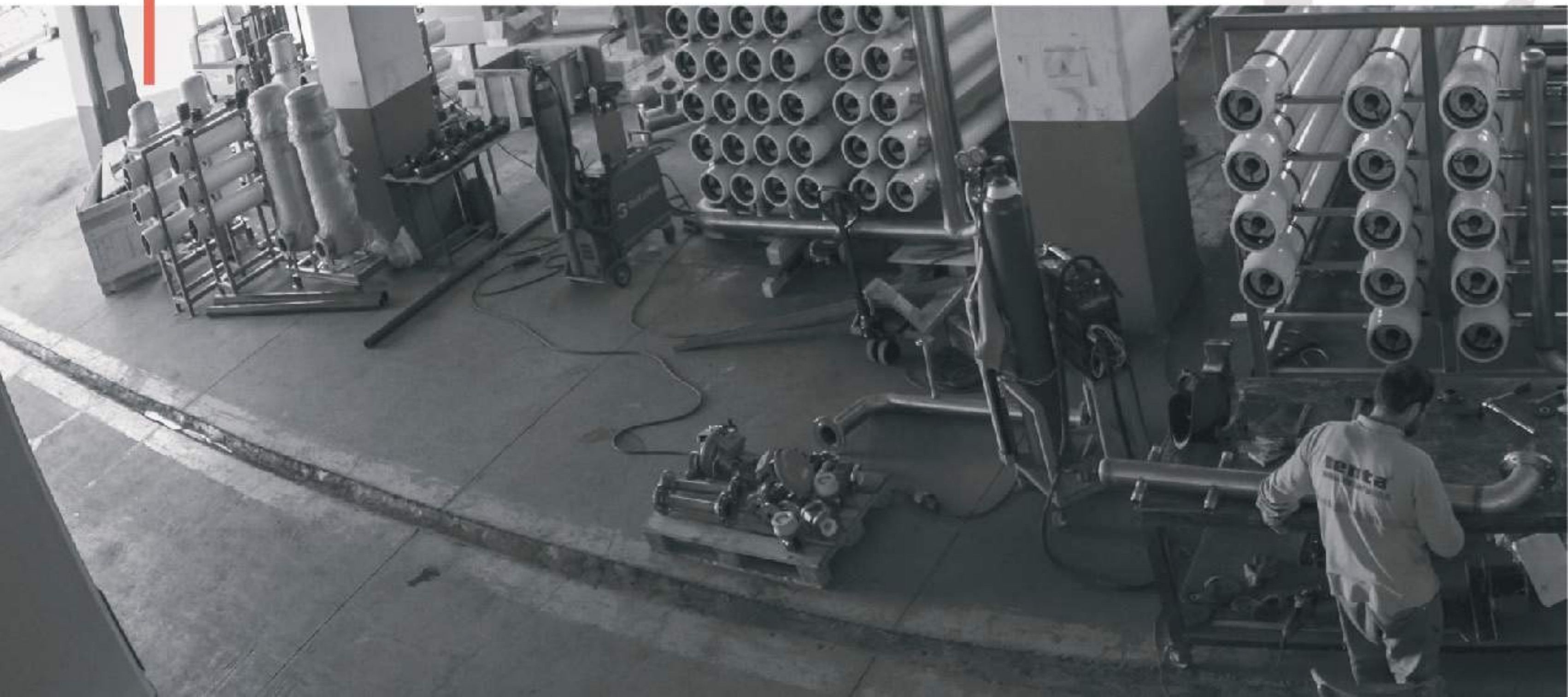
ENTA has specialized for variety of different processes; conventional biological treatment, up to date different applications of biological processes; MBR, MBBR, fixed bed bioreactor and membranes processes; UF, NF & RO.

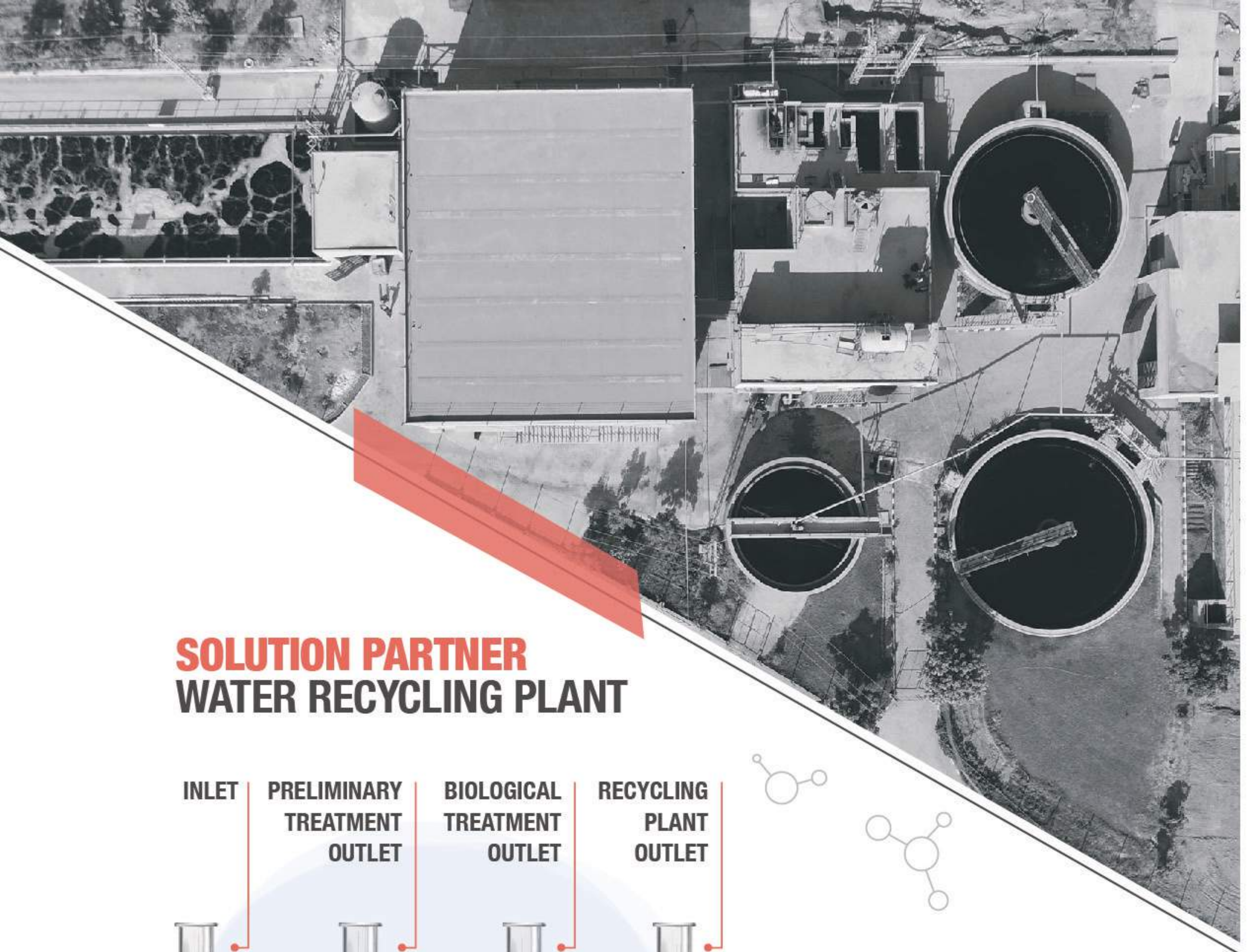
ENTA's scope of services start with laboratory experiments, treatability studies with own pilot plants (RO, UF, NF, electrocoagulation and electrooxidation), plant design and engineering followed by treatment plant equipment manufacturing and supply, construction of the plants and operation & maintenance of them.

We offer the most optimal solution specific to our clients by analyzing the needs of them in the most precise way with our pilot plants as a result of our R&D studies.

5 million m³ of water is recovered annually in the recycling plants we have built by proving our R&D studies on a real scale many times with the wastewater recycling plants we have established in Türkiye and abroad.

MANUFACTURING FACILITY





SOLUTION PARTNER **WATER RECYCLING PLANT**

INLET

**PRELIMINARY
TREATMENT
OUTLET**

**BIOLOGICAL
TREATMENT
OUTLET**

**RECYCLING
PLANT
OUTLET**



WASTEWATER TREATMENT PLANTS

Wastewater treatment is a process which removes contaminants from wastewater and converts this into an effluent that can be disposed. The main purpose of wastewater treatment is for the treated wastewater to be able to be discharged safely. Treatment processes are designed according to the characterization of the wastewater. The treatment consists of the physical treatment, chemical treatment and biological treatment and sludge dewatering processes.

Physical Treatment



Chemical Treatment



Biological Treatment



Sludge Dewatering



PYHSICAL TREATMENT

Pyhsical Treatment is the pretreatment consists of screening, equalization, grit removal and also oil-grease removal.



Screening

Screens sepearate the solids in the wastewater to prevent clogging of pumps and other mechanical equipment.

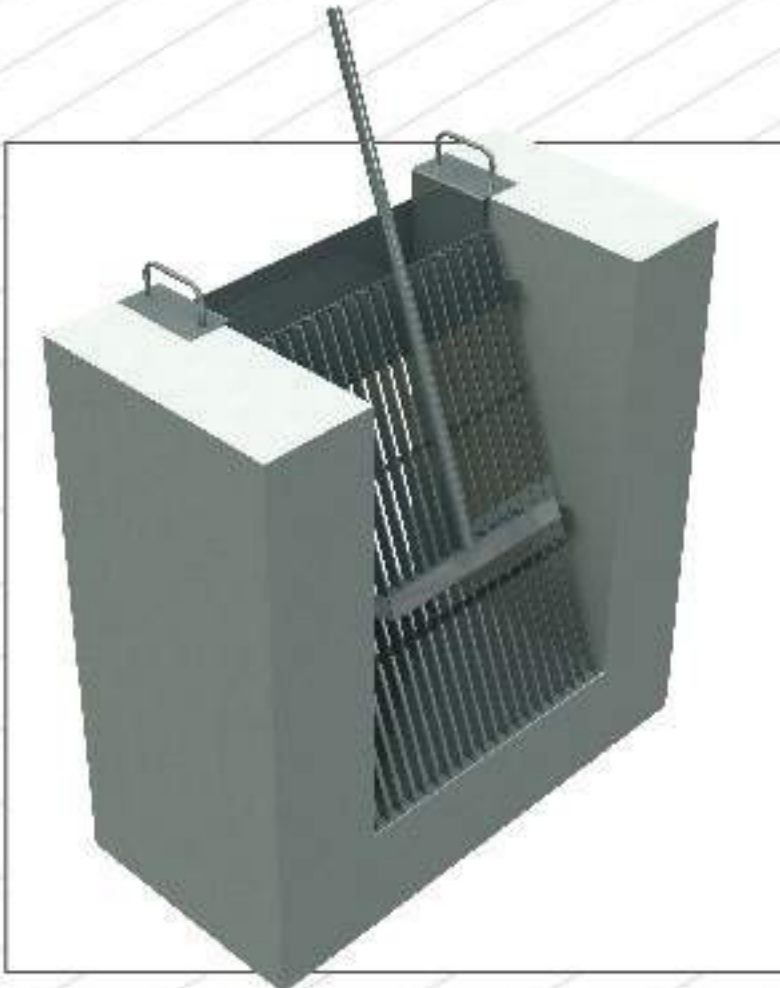
Equalization

Wastewater is taken into equalization tank for hydraulic and organic equalization and homogenization.

Grit-Grease Removal

Grit and grease is removed from the wastewater by physically.

PHYSICAL TREATMENT EQUIPMENTS



SCREENING

Manuel Screen

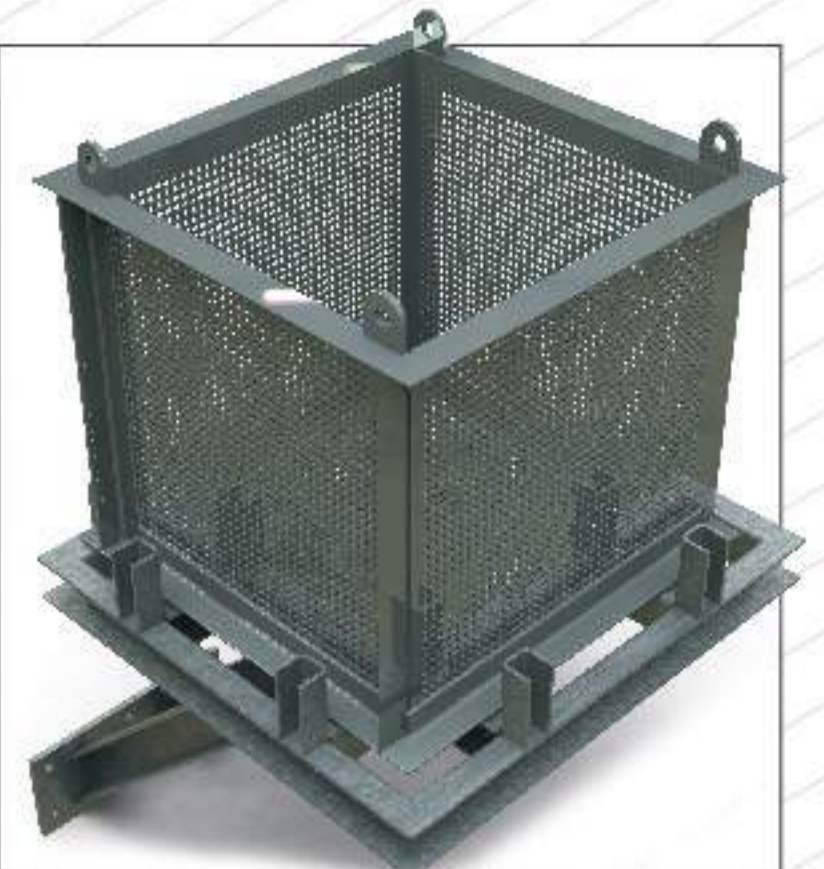
- Bar spaces: 20-50 mm
- Manual cleaning, waste collection in basket
- Motor not need
- Material: AISI304/AISI316



SCREENING

Basket Screen

- Optional bar spaces
- Effective in low capacity water treatments
- Wedge wire or perforated type
- Wall-mounted, can be lifted on rails by jib crane
- Motor not need
- Material: AISI304/AISI316



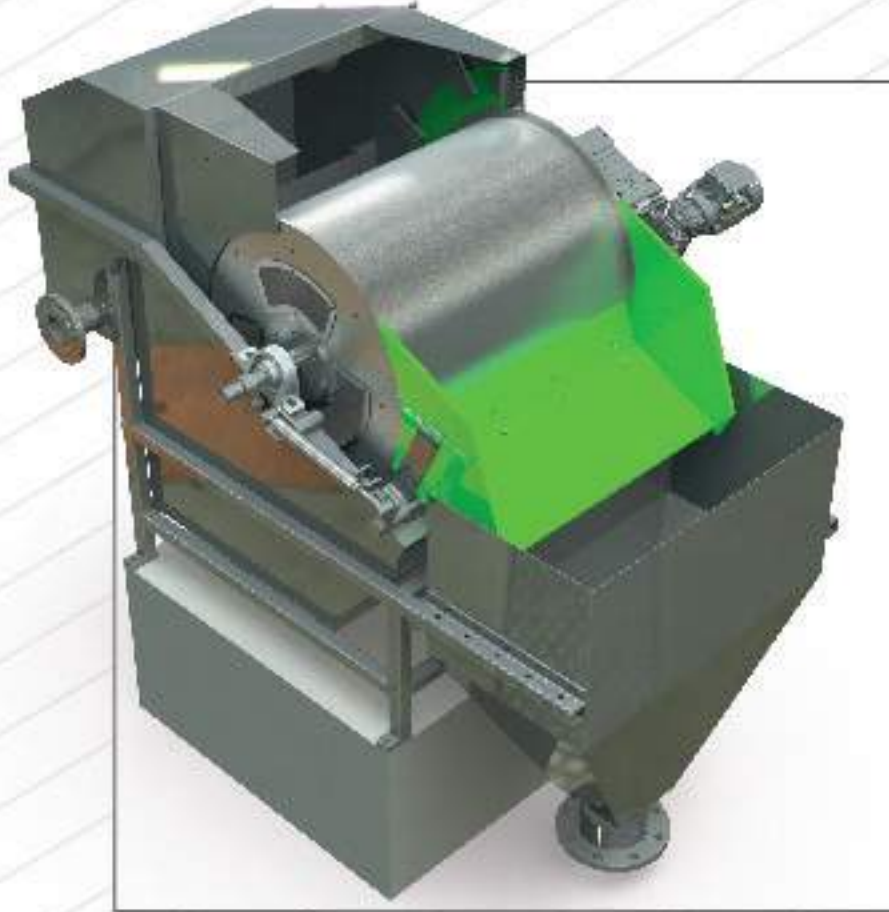
SCREENING

Mechanical Bar Screen

- 10 mm - 50 mm bar spaces
- Separating the solids with automatic chain-rake system and conveys the solids to conveyor by the reverse scraper located behind it
- Mounted on the channel at 70°-75° angles
- Material: AISI304/AISI316



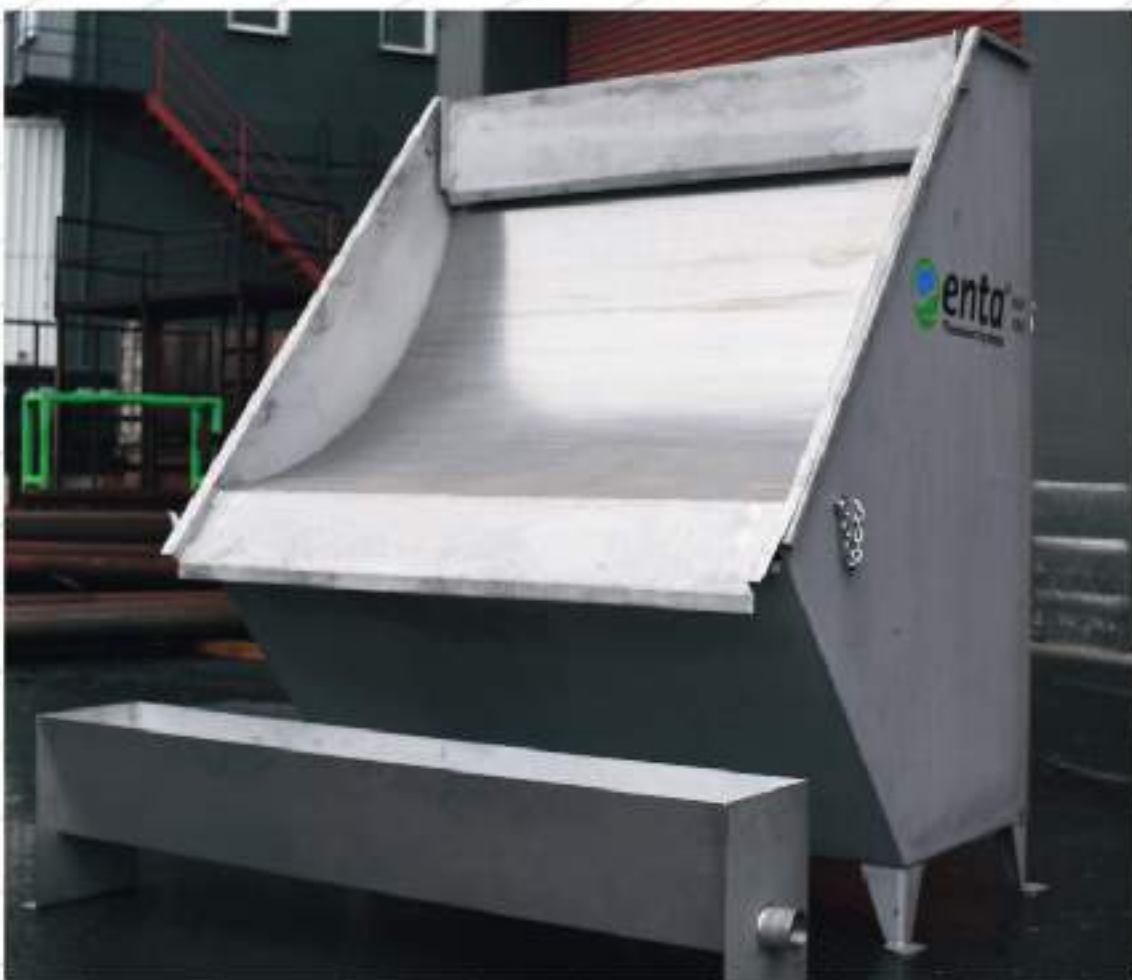
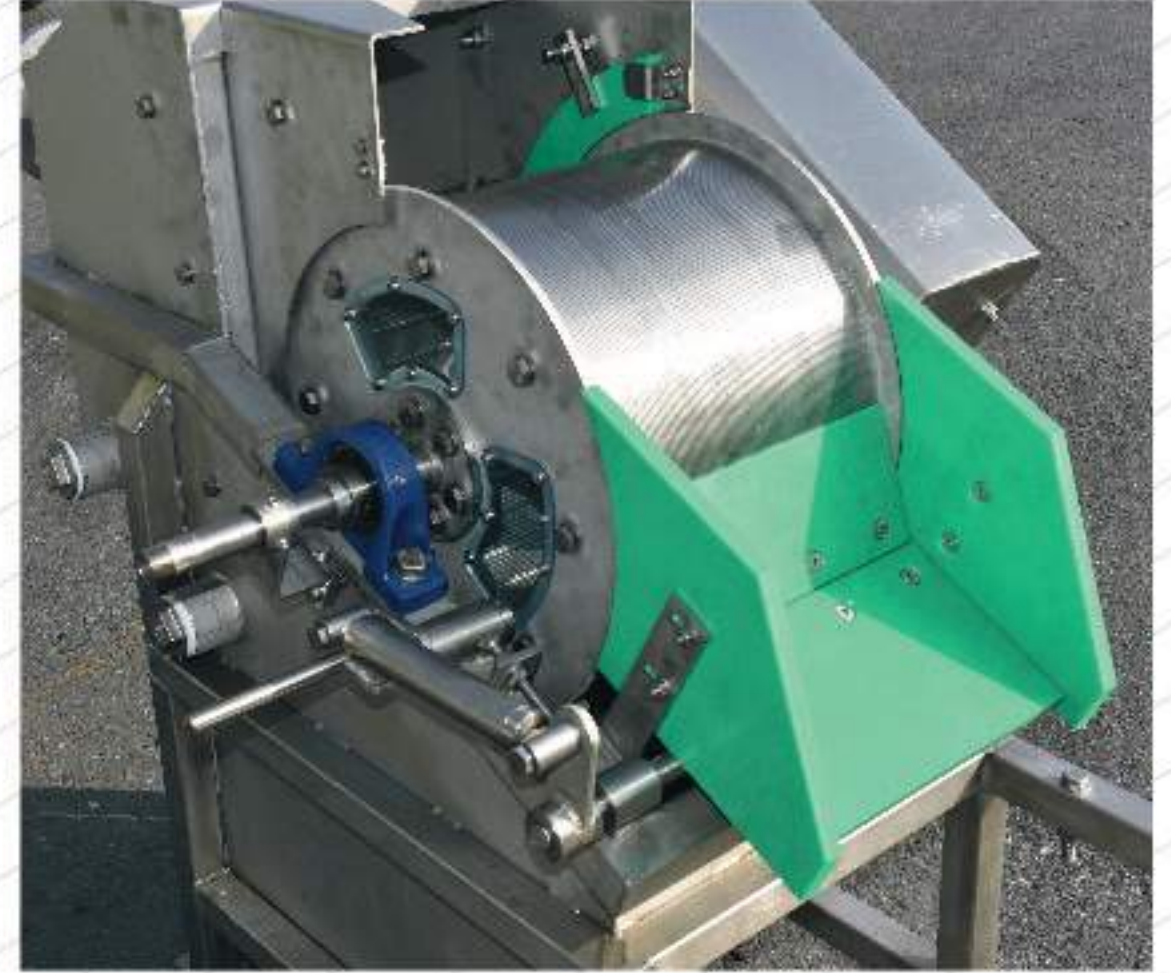
PHYSICAL TREATMENT EQUIPMENTS



SCREENING

Drum Screen

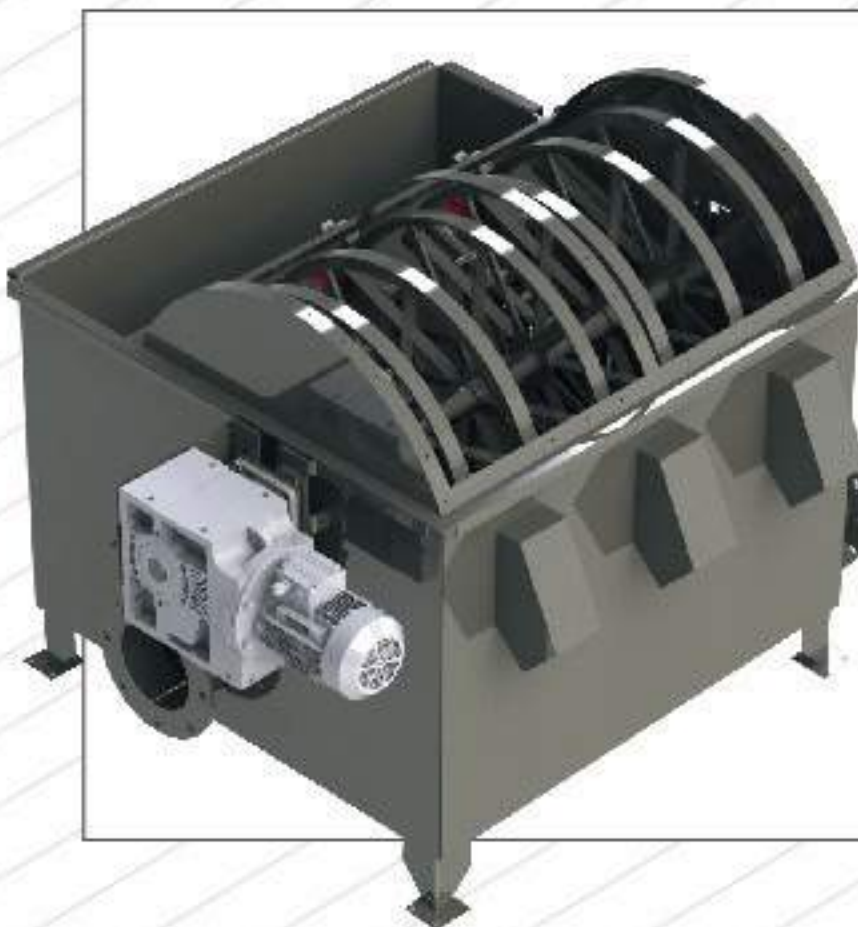
- Mesh sizes: 250 - 1000 microns
- Cleaning by backwashing with pressurized water
- Wedge wire or perforated type
- Material: AISI304/AISI316



SCREENING

Static Screen

- Mesh sizes: 0.5 - 10 mm
- Especially to separate the solids such as fiber and fibrous waste
- Wedge wire or perforated
- Motor not need
- Material: AISI304/AISI316



SCREENING

Disc Screen

- Mesh sizes: 250 - 1000 microns
- Effective in filamentous wastes
- Cleaning by backwashing with pressurized water
- Material: AISI304/AISI316



PHYSICAL TREATMENT EQUIPMENTS



SCREENING

Rotary Disc Screen

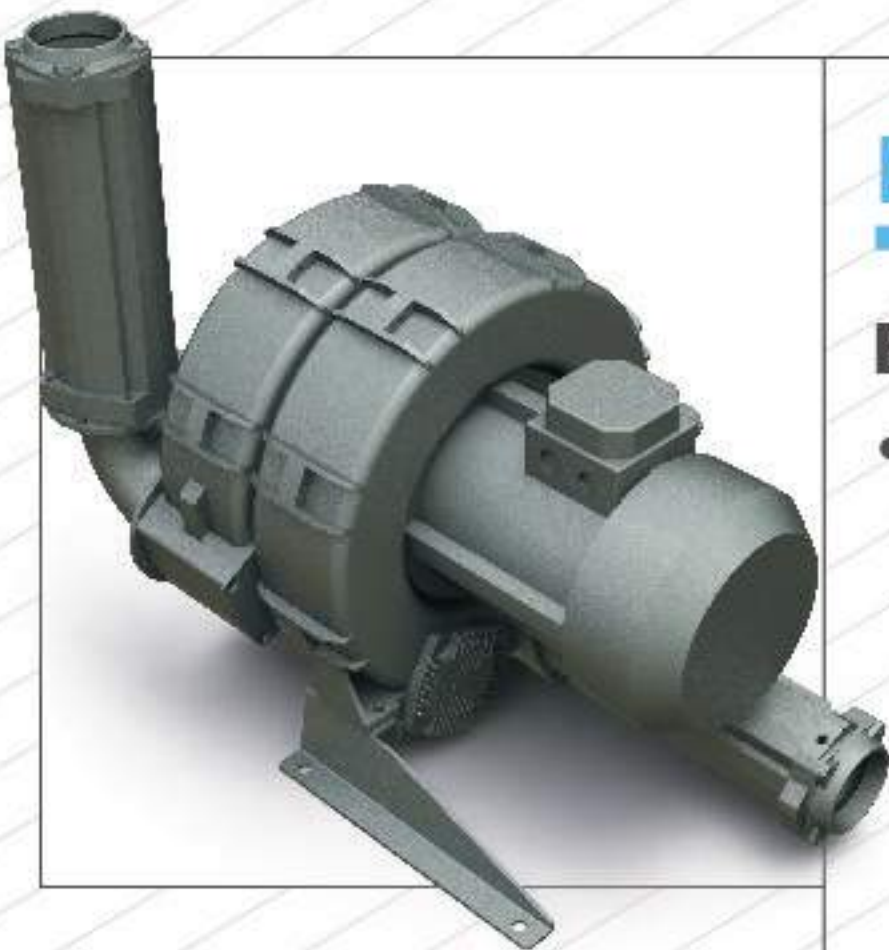
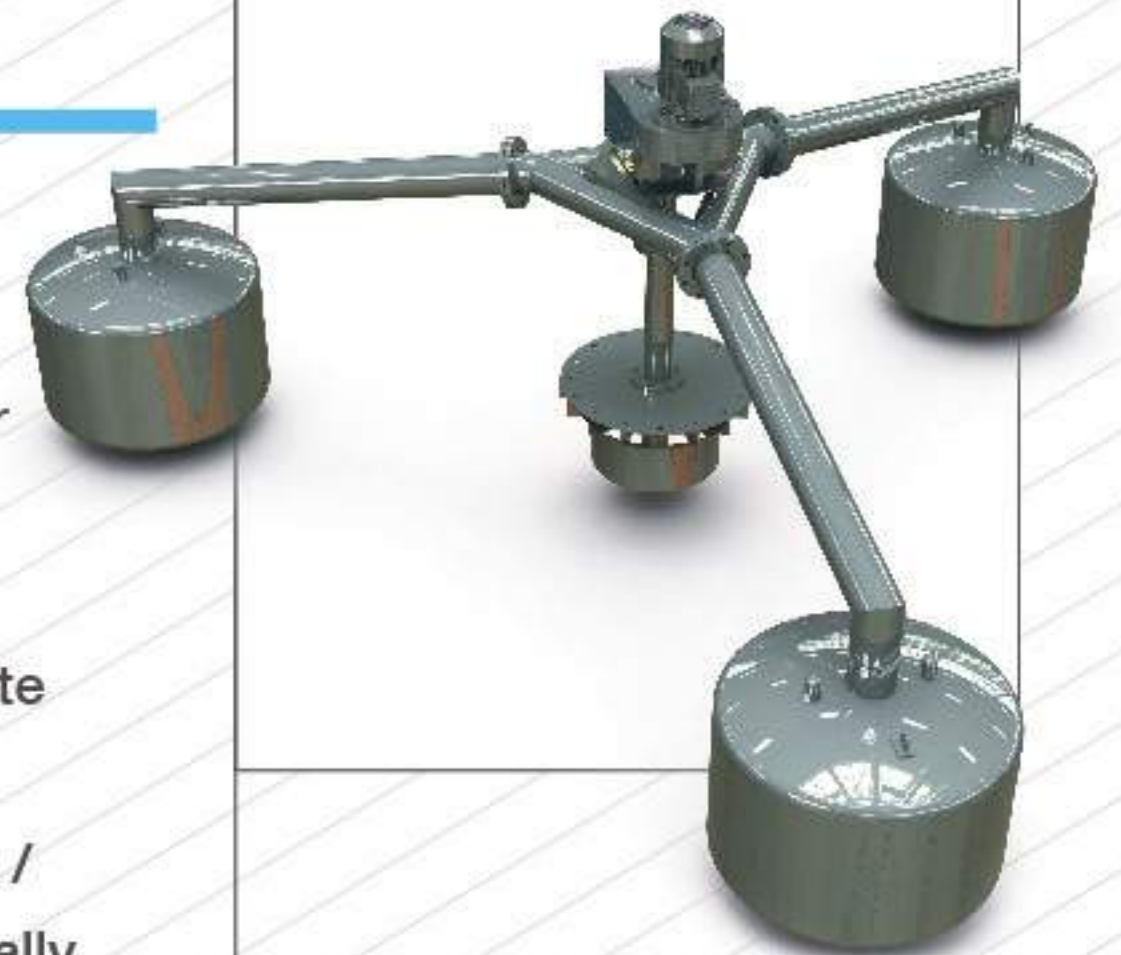
- Mesh sizes: 500-1000 microns
- Screening, washing, conveying and dewatering in one unit
- Wedge-wire or perforated type
- Material: AISI304/AISI316



EQUALIZATION

Jet Aerator

- Mixing and providing the appropriate amount of air (the capacity range of 1.2 - 1.8 kg.O₂/kWh)
- Fixed on a reinforced concrete structure or floating systems
- Material: Epoxy coated ST37 / Hot-dip galvanized or optionally AISI304/AISI316



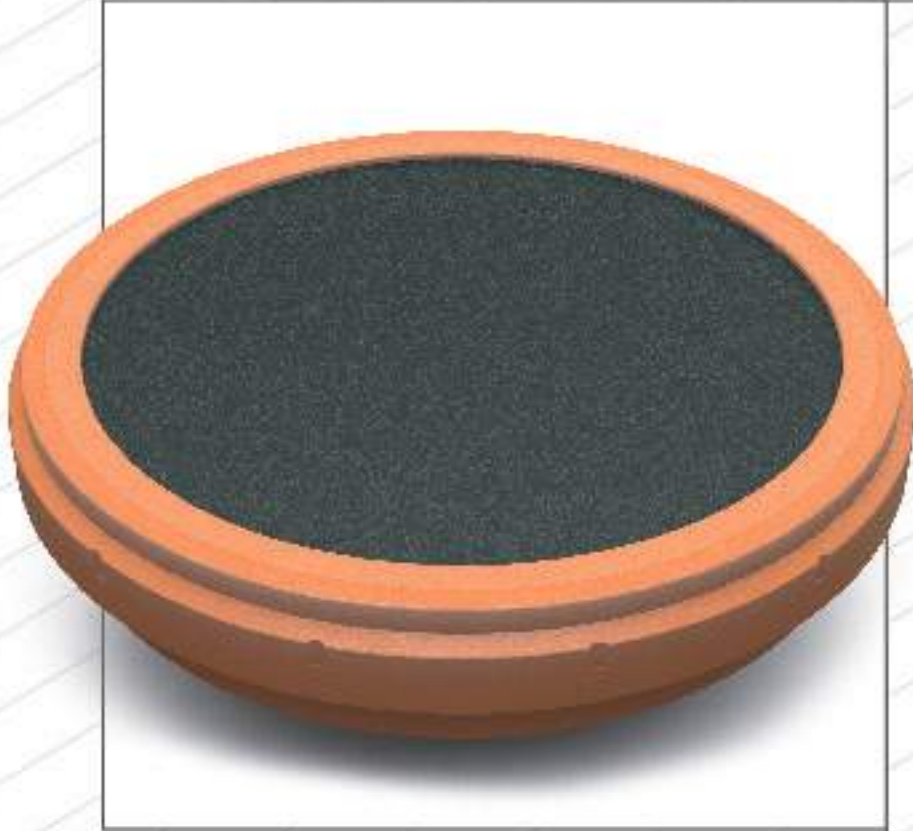
EQUALIZATION

Blower

- Transferring of the air in the emitted environment at high flow rate or low pressure



PHYSICAL TREATMENT EQUIPMENTS



EQUALIZATION

Diffuser

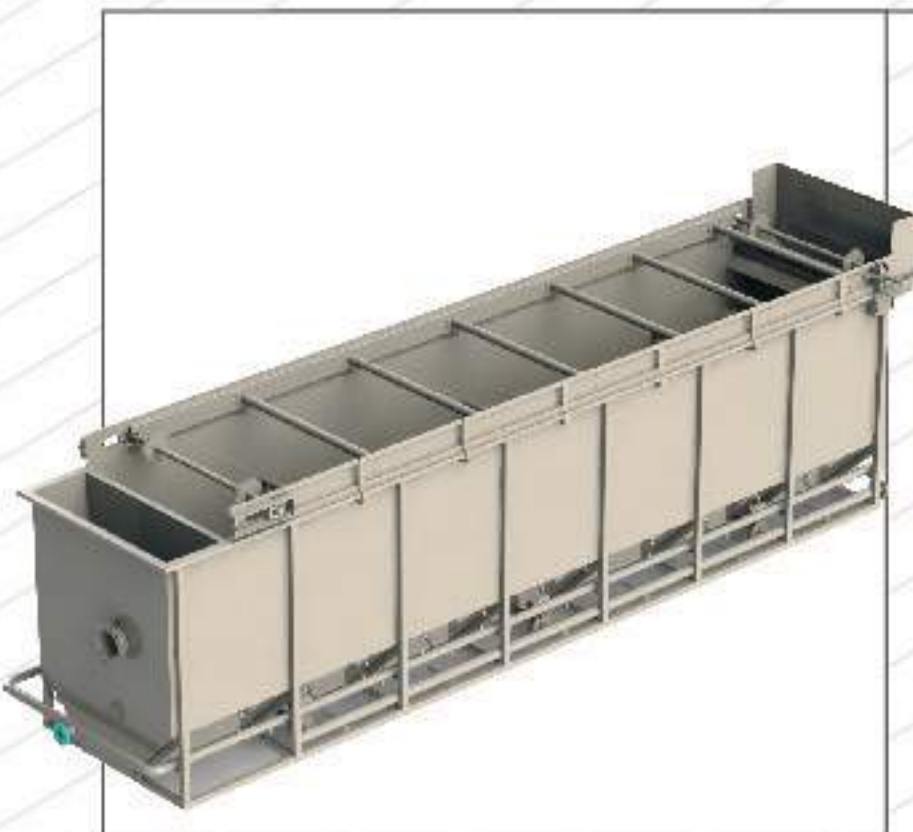
- The air created by blowers to be given into the tank in the form of fine bubbles



GRIT REMOVAL

Grit Classifier

- Providing dewatering and removal of wet sand collected from grit removal units
- The wet sand passes to the tank and settles to the bottom and the settled sand is transported as dewatered to the top by a screw
- Material: AISI304/AISI316



GREASE REMOVAL

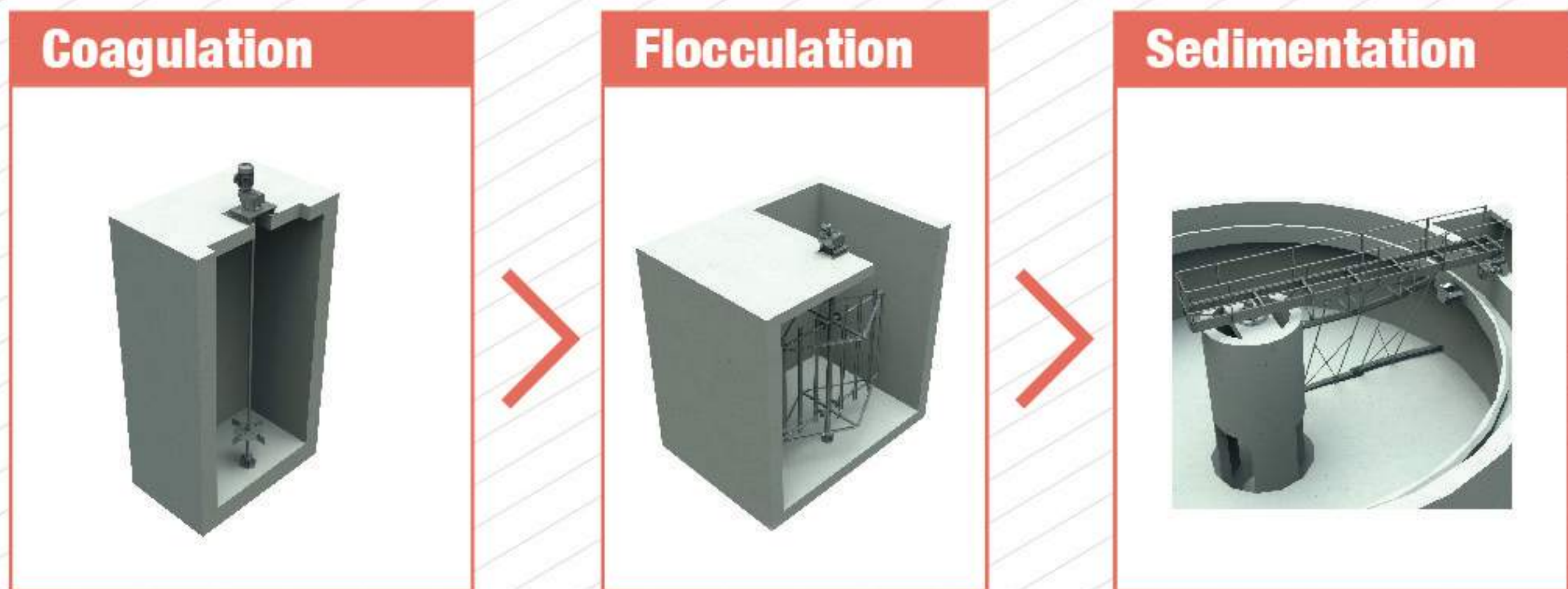
Dissolved Air Flotation (DAF)

- DAF is a system in which oil-like substances floating or suspended in water are collected by scraper equipment after they are transported to the surface with air bubbles
- Substances heavier than water are taken as sludge from the bottom of the tank
- Material: Epoxy coated ST37 or AISI304/AISI316



CHEMICAL TREATMENT

Chemical Treatment is where the wastewater is treated by chemicals that consists of coagulation, flocculation and sedimentation units.



Coagulation

Coagulation is the process of making the colloid-sized solid particles in the wastewater, which can not precipitate by their own weight, collapsible with the help of various chemicals.

Flocculation

After coagulation particles that are destabilised in water come together and form a more stable floc. Flocs are brought into contact with each other in order to be transformed into large structures. This process is carried out by slow mixing of water and is known as flocculation.

Sedimentation

The wastewater is then taken into the chemical sedimentation tank to precipitate the flocked flocs. Flocks (sludge) formed in this tank, where there is no mixture, settle towards the bottom of the tank. At the bottom of the tank, accumulated sludge in the conical part is pressed into the sludge tank by chemical sludge pumps.

CHEMICAL TREATMENT EQUIPMENTS



COAGULATION

Coagulation Mixer

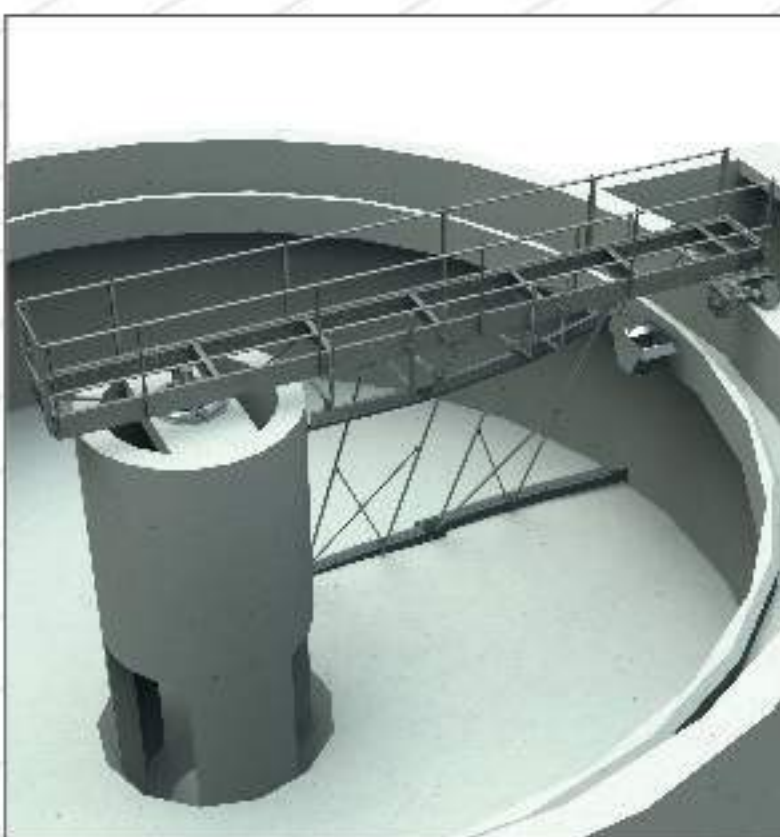
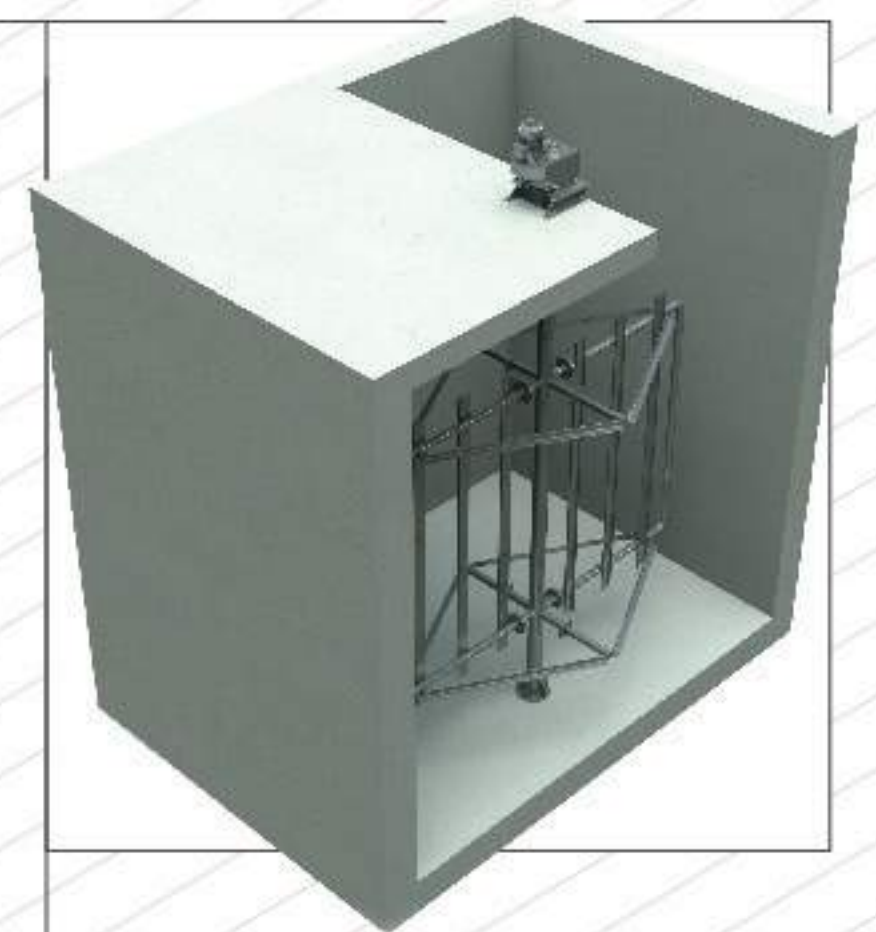
- Mixturing at the appropriate speed
- Production at the desired speed
- Fan: Pitch blade/Hydrofil or standard anchor type
- Fan-diameter: depends on the rotation speed
- Manufactured with or without lower bearing
- Material: AISI304/AISI316



FLOCCULATION

Flocculation Mixer

- Mixturing at the appropriate speed
- Production at the desired speed
- Number of blades depends on the rotation speed
- Manufactured with or without lower bearing
- Material: AISI304/AISI316



SEDIMENTATION

Sedimentation Scraper

- Scraping the sludge that settles to the bottom in sedimentation tanks
- Removing also foam formed on the surface
- Full or half bridges upon request
- Material of bridge: Hot-dip galvanized
- Material of parts contact with water: AISI304/AISI316



BIOLOGICAL TREATMENT

Biological treatment is the removal of organic substances that can not be removed from wastewater by physical and chemical processes with the help of microorganisms as food and energy sources. The purpose of biological treatment is to remove soluble organics.

Biological Treatment Process



Sedimentation



Biological treatment takes place in aeration tanks. While the oxygen required for biological treatment is delivered to the water via blower + diffuser, complete mixing is also achieved in the tank. After the organic substances in the wastewater are biodegraded by a community of microorganisms called activated sludge as a result of a series of biochemical reactions, the wastewater is taken to the biological sedimentation tank. In the sedimentation tank, sludge settles to the bottom of the tank. The sludge accumulated here is transferred back to the head of the aeration tank by a recirculation sludge pump, ensuring that the microorganism concentration in the reactor is kept at the desired level. Excess sludge is given to the sludge tank. Wastewater taken from the sedimentation tank through weirs is discharged.

BIOLOGICAL TREATMENT METHODS

Activated Sludge Treatment Systems

Activated sludge treatment systems are used for the removal of COD, BOD, TSS from wastewater. The purpose of activated sludge processes is to ensure the removal of non-precipitable substances in colloidal and dissolved forms in wastewater by converting them into rapidly precipitable biological flocs.

Membrane Bioreactor (MBR) Process

Membrane bioreactor (MBR) treatment systems are one of the active sludge process are systems that combine the sludge process with the membrane separation process. The reactor is operated in a similar way to a conventional activated sludge process.



WASTEWATER TREATMENT PLANT
GREY WATER

2.000 m³ / day

UZBEKISTAN 

WASTEWATER TREATMENT PLANT
TEXTILE INDUSTRY

4.000 m³ / day

EGYPT 



Sequencing Batch Reactor (SBR) Process

Sequencing Batch Reactor SBR is an aerobic biological treatment process. By bringing wastewater into contact with microorganisms, it converts pollution into carbon dioxide (CO₂) and new biomass.



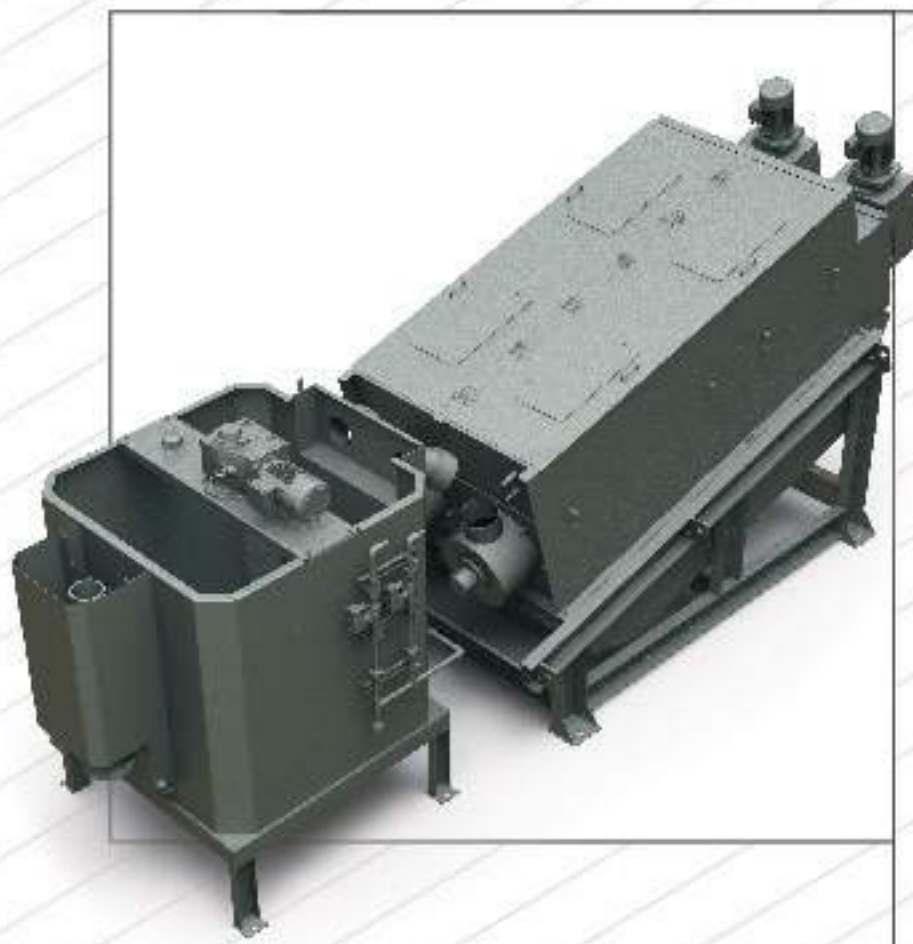
WASTEWATER TREATMENT PLANT
TEXTILE INDUSTRY

4.000 m³ / day

UZBEKISTAN 

SLUDGE DEWATERING

The sludge formed in the system is collected in the sludge tank and sent to the sludge dewatering unit through the sludge pump, where it is dewatered and turned into a cake and then removed.



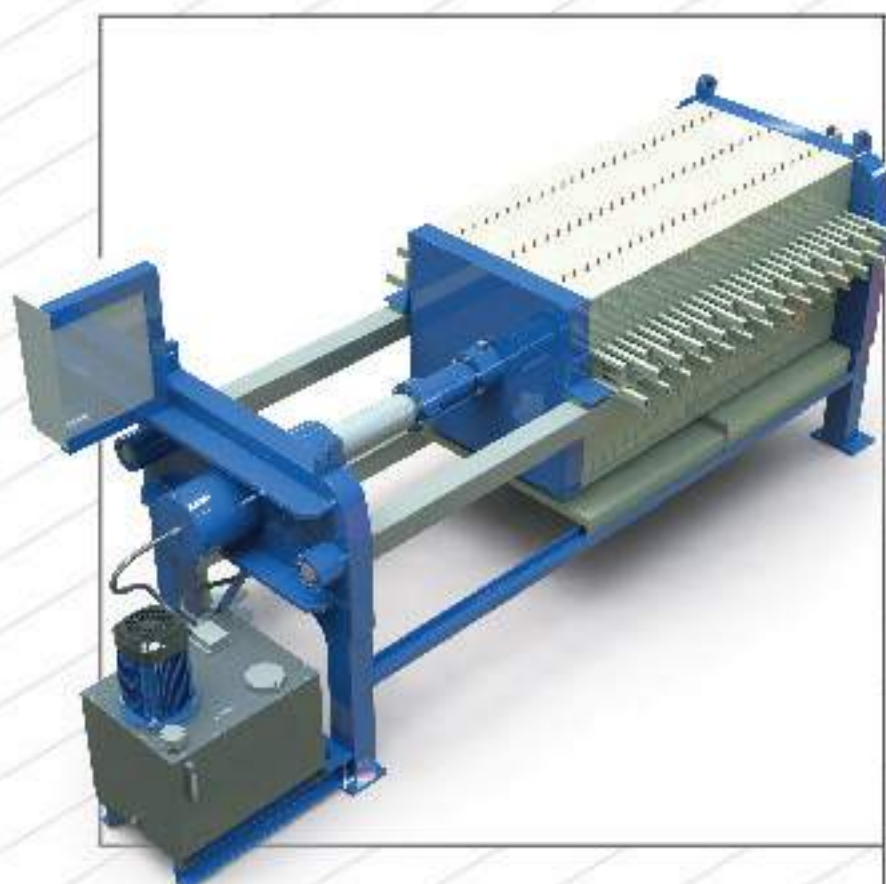
Screw Press

Screw press is a sludge dewatering machine that provides solid-liquid separation. The wastewater sludge is dewatered progressively by Screw Press ending by the rotary filter plate within the movement of the free rings.



Decanter

Decanter is a horizontal centrifugal machine used for the separation of water and sludge mixture.

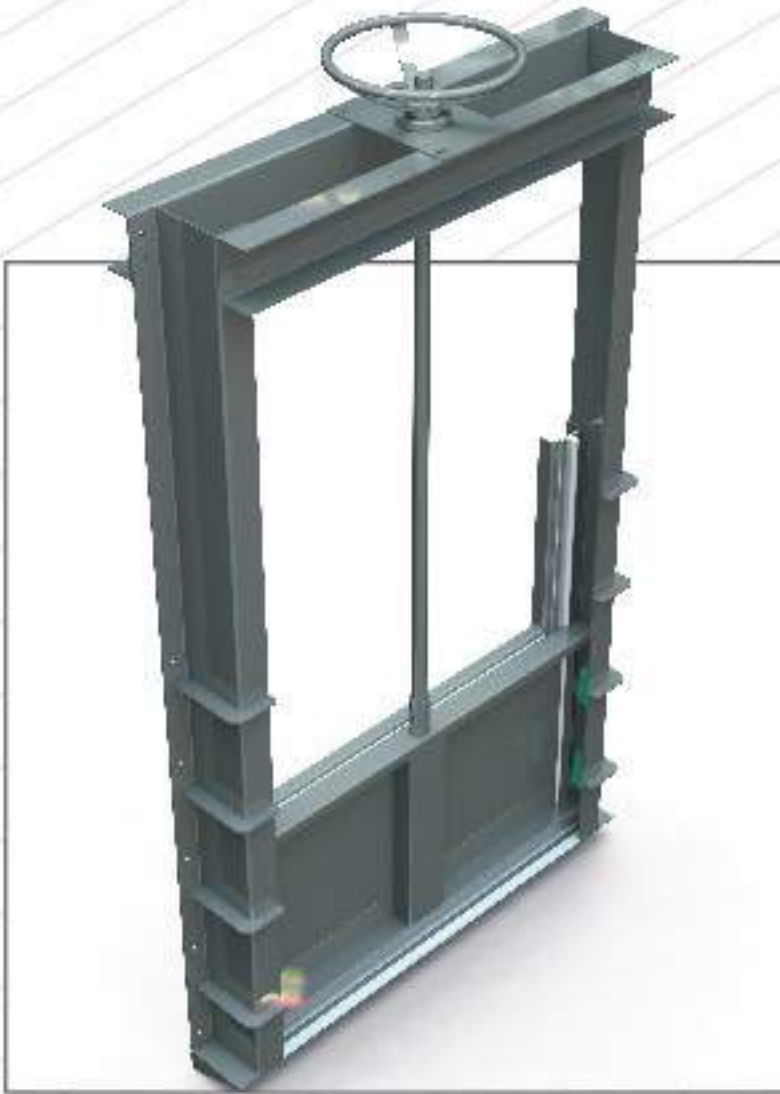


Filter Press

Filter press is a mechanical filtration equipment that provides solid-liquid separation of liquids of pumpable viscosity containing solid particles under high pressure by means of plates and cloths. The filter press separates the sediment, mud and sawdust in the liquid by filtering.



OTHER EQUIPMENTS



Penstock

- Channelization of water
- Wall type, channel type and weir type
- Manuel or automatic
- Material: AISI304/AISI316



Screening Compactor

- Transportation, compress and dewatering of the wastes separated from the wastewater by screens.
- Material: AISI304/AISI316



Screw Conveyor

- Transportation of screen wastes and sludge
 - Material: AISI304/AISI316
- Material of screw: Epoxy painted ST37



OTHER EQUIPMENTS



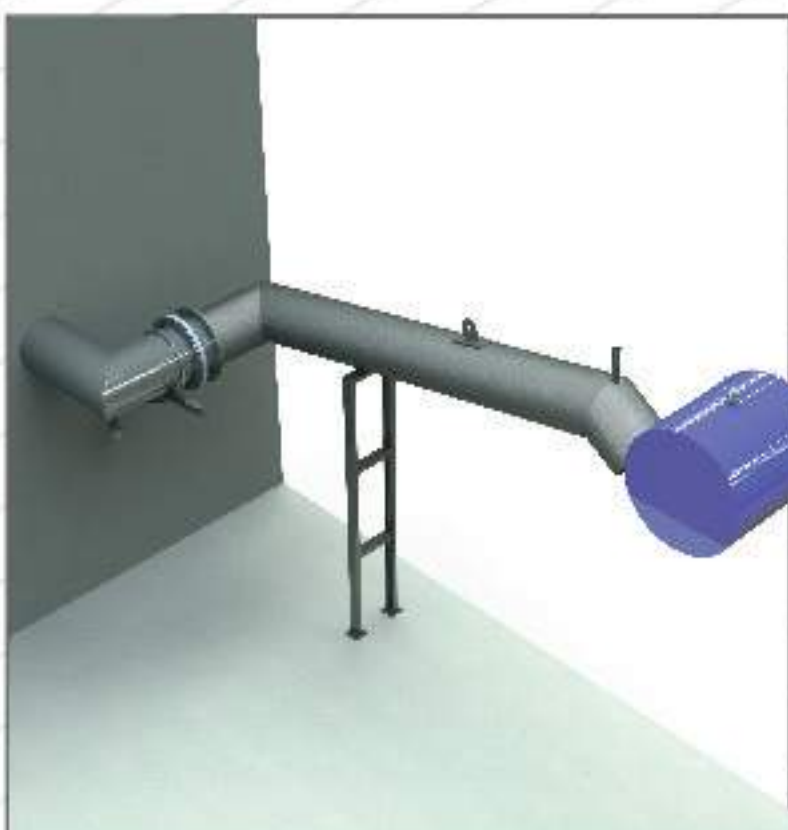
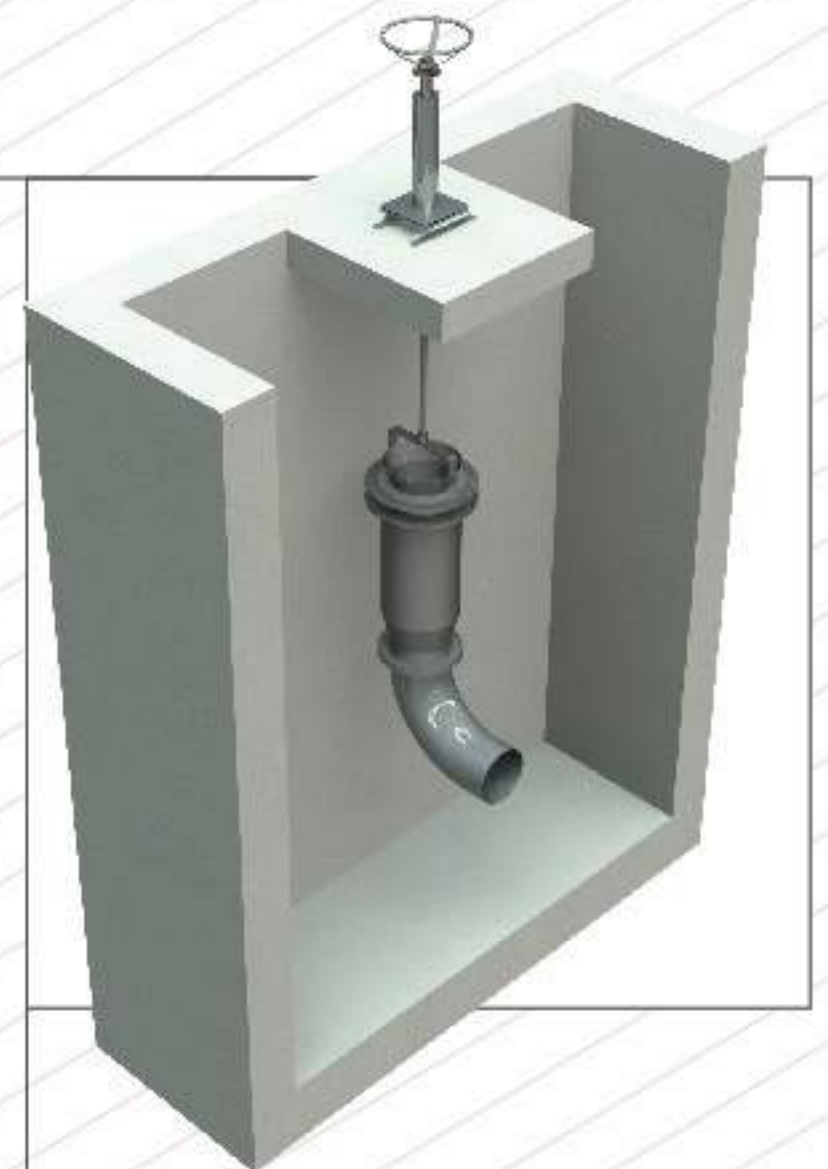
Belt Conveyor

- Transportation of screen wastes and sludge
- Speed: 0.3 m/s
- Optional band width
- Material of chassis: Galvanized
- Material of band: Rubber



Telescopic Valve

- Collection of sludge at the appropriate level from the settlement tank
- Optional working range (standard: 1.0-1.2 meters)
- Automatic and electrically actuated
- Material: Epoxy painted ST37 or AISI304/AISI316



Decanting System

- Suspended discharge pipe connected to the pontoon
- Especially for SBR systems to drain the water depending on the level
- Material: Epoxy painted ST37 or AISI304/AISI 316



OTHER EQUIPMENTS



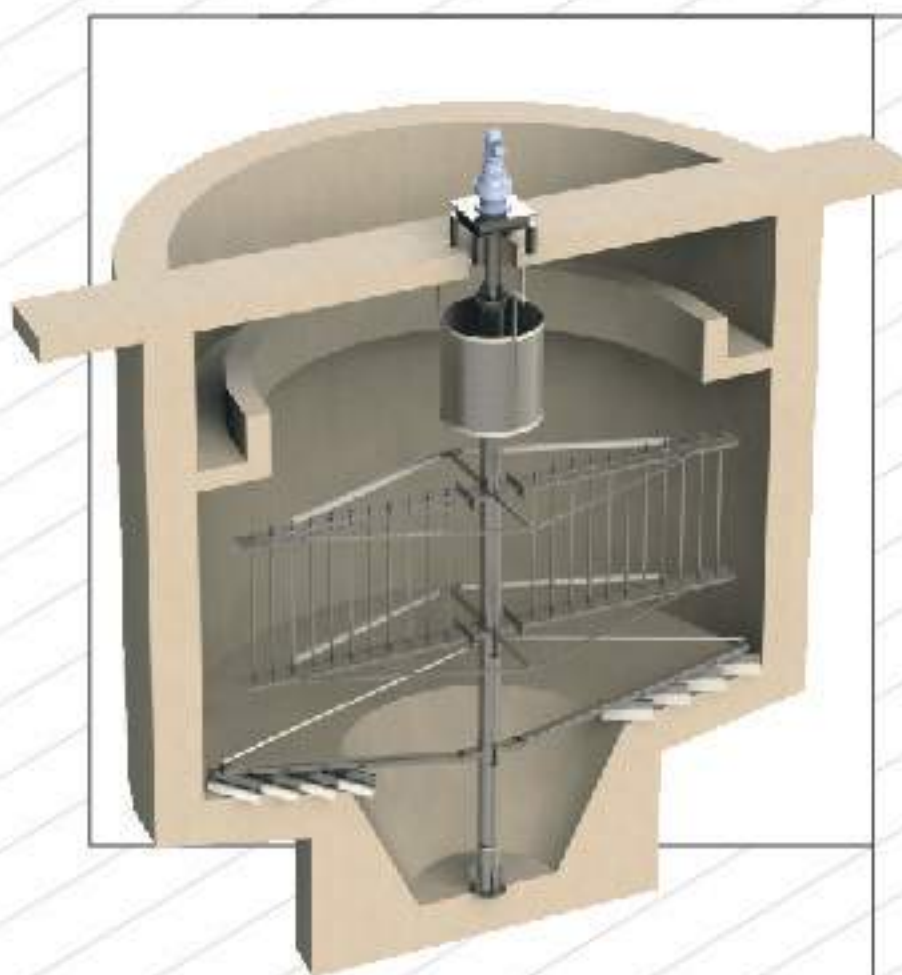
Jib Crane

- Capacity: 250-500 kg (standard) / 1000-1500 kg (manually or electrically)
 - Boom length can be adjusted in vertical and horizontal axis.
 - Material: Epoxy or hot-dip galvanized coated ST37 and AISI304/AISI316
- Material of rope: AISI304/AISI316



Automotical Chemical Preperation Unit

- Providing solutions from chemicals (0.1% to 10% solutions)
- Consists of 3 chambers and 2 or 3 mixers
- Fully automatic (Pressure switch, ultrasonic level sensor, heater, flowmeter etc. all necessary instruments are included)
- Material: AISI304/AISI316



Sludge Scraper

- Increasing the solid matter of the sludge, used in sludge tank
- Material: AISI304/AISI316



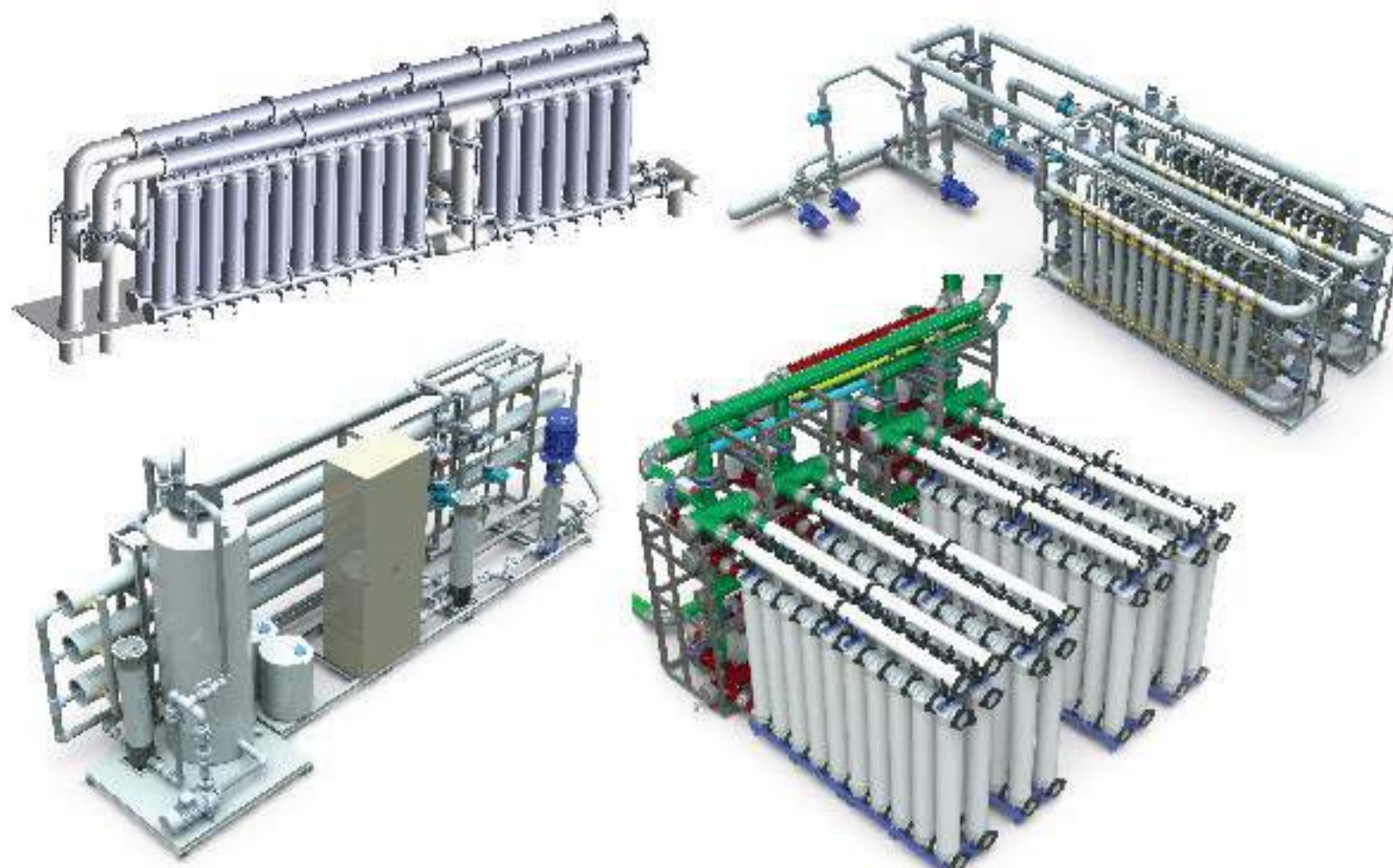
WASTEWATER RECYCLING PLANTS

Wastewater Recycling Plant ensures that the water to be discharged from the wastewater treatment plant is treated and turned into recycled water. It consists of Filtration and Membrane Processes.

Filtration



Membrane Processes



FILTRATION

Filtration is the pretreatment of wastewater recycling which is the process of passing water through a porous medium.



MULTIMEDIA FILTER

Fast and slow sand filters are commonly used for filtration purposes



ACTIVATED CARBON

Activated carbon adsorption can be defined as the process of concentration of atoms, ions or molecules in the liquid or gas phase on the surface of the solid phase



MEMBRANE PROCESSES

Membrane is a permeable or semi-permeable material made of metals, inorganic or organic polymers that continuously selects between two phases, restricting the movement of certain species, and is used for purposes such as gas separation, solid/liquid and liquid/liquid separation. Microfiltration, Ultrafiltration, Reverse Osmosis and Nanofiltration processes can be applied.

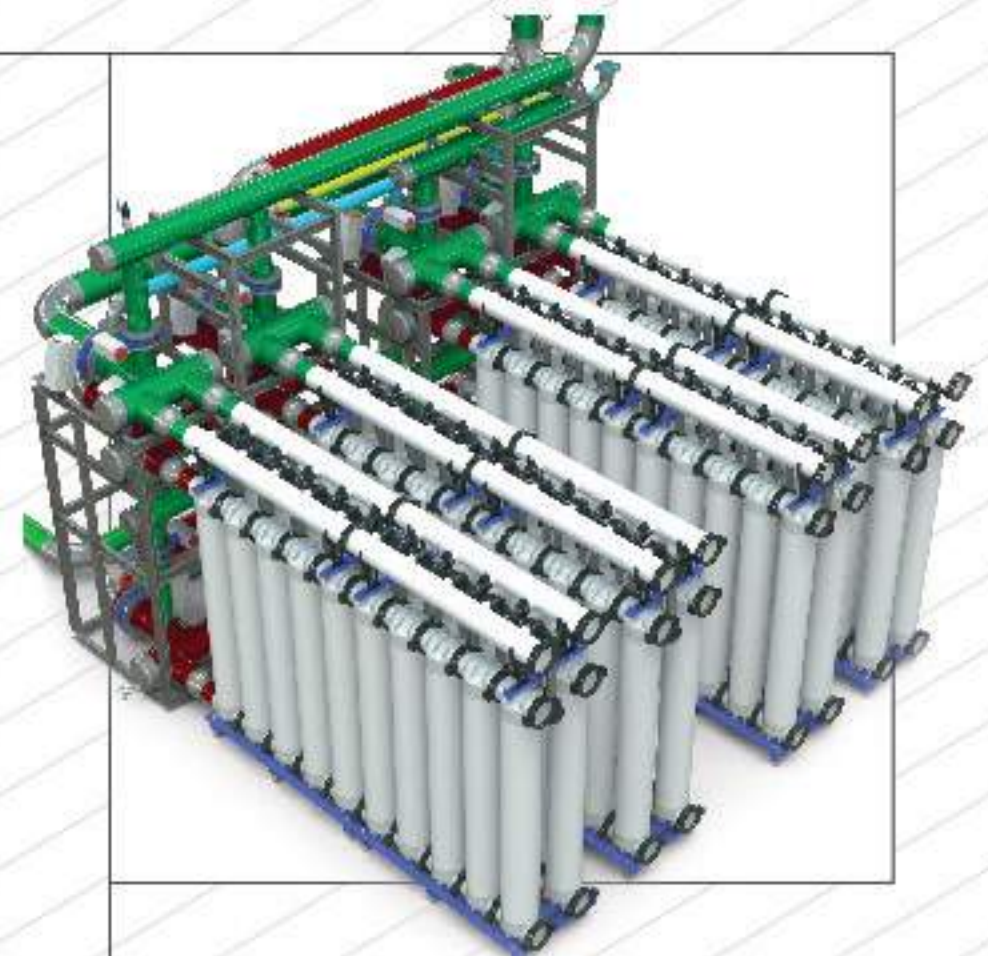
Microfiltration (MF)

- Micro Filtration is used to retaining particles larger than $0.6\text{ }\mu\text{m}$.
- Microfiltration membrane can removing turbidity and suspended solids from wastewater



Ultrafiltration (UF)

- Ultrafiltration is used to retaining particles between $1\text{-}100\text{ nm}$.
- Ultrafiltration membrane can removing turbidity, suspended solids and also bacteria and viruses from wastewater.



MEMBRANE PROCESSES

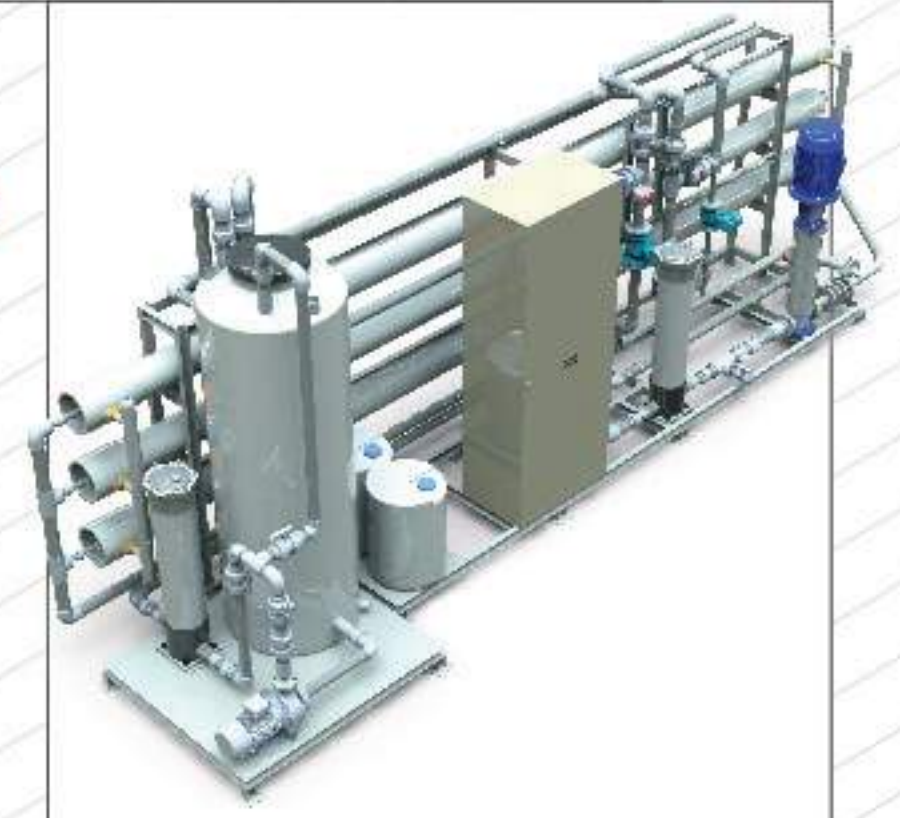
Nanofiltration (NF)

- Retaining particles that can not be retained in ultrafiltration and reverse osmosis
- Removing bacteria, viruses, organic residues and hardness



Reverse Osmosis (RO)

- Retaining ions
- Unlike other methods, high water pressure is required



WASTEWATER TREATMENT PLANT
TEXTILE INDUSTRY
Sand Filter + Active Carbon +
Reverse Osmosis

1.600 m³ / day
TÜRKİYE 

85% RECOVERY

REFERENCES

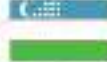


WASTEWATER TREATMENT PLANT

DOMESTIC WASTEWATER

Physical + Biological +
Disinfection + Sludge Dewatering

4.000 m³ / day

UZBEKISTAN 



WATER TREATMENT PLANT

DRINKING WATER

Physical + Chemical + Filtration

60.000 m³ / day

IRAQ 



WASTEWATER TREATMENT PLANT

TEXTILE INDUSTRY

Physical + Chemical + Biological +
Filtration

3.640 m³ / day

PAKISTAN 



WASTEWATER RECYCLING PLANT

THERMAL POWER INDUSTRY

Chemical + Sand Filter + Reverse Osmosis
%75 Recovery

10.800 m³ / day

TÜRKİYE 

REFERENCES

WASTEWATER TREATMENT PLANT

POULTRY INDUSTRY

Physical + Chemical + Dissolved
Air Flotation + Biological +
Filtration + Sludge Dewatering

3.200 m³ / day

OMAN 



WATER TREATMENT PLANT

DRINKING WATER

Physical + Chemical + Biological +
Sludge Dewatering

250.000 m³ / day

TÜRKİYE 



WASTEWATER TREATMENT PLANT

AUTOMOTIVE INDUSTRY

Physical + Chemical

WATER TREATMENT PLANT

PROCESS WATER

2.000 m³ / day

RUSSIA 



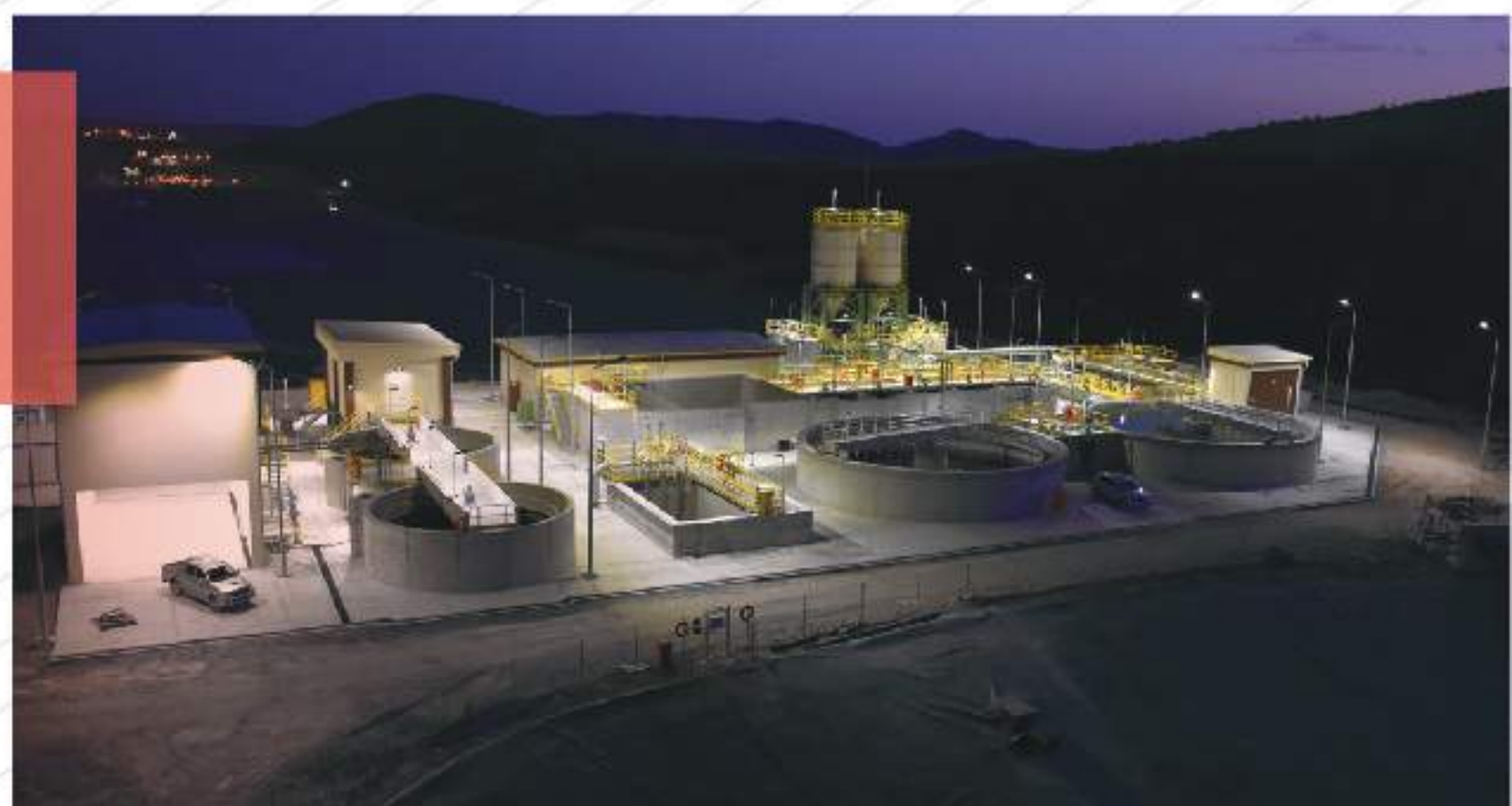
WASTEWATER TREATMENT PLANT

MINING INDUSTRY

Physical + Chemical +
Sludge Dewatering

15.000 m³ / day

TÜRKİYE 



REFERENCES



WASTEWATER TREATMENT PLANT

DOMESTIC WASTEWATER
Physical + Biological

78.500 m³ / day

TÜRKİYE 



WASTEWATER TREATMENT PLANT

TEXTILE INDUSTRY
Physical + Chemical + Biological

WASTEWATER RECYCLING PLANT

Sand Filter + Reverse Osmosis

6.300 m³ / day

PAKISTAN 



WATER TREATMENT PLANT

LEATHER INDUSTRY
Physical + Chemical + Biological +
Sludge Dewatering

36.000 m³ / day

TÜRKİYE 



WATER RECYCLING PLANT

TEXTILE INDUSTRY
Sand Filter + Active Carbon +
Reverse Osmosis
%70 Recovery

3.000 m³ / day

TÜRKİYE 

REFERENCES

WASTEWATER TREATMENT PLANT

TEXTILE INDUSTRY

Physical + Chemical + Biological +
Sludge Dewatering

1.300 m³ / day

IRAN 



WASTEWATER TREATMENT PLANT

TEXTILE CHEMICALS INDUSTRY

Physical + Chemical + Biological

15.000 m³ / day

TÜRKİYE 



WASTEWATER RECYCLING PLANT

REFINING INDUSTRY

Deaeration + Reverse Osmosis +
Electrodeionization

3.640 m³ / day

PAKISTAN 



WASTEWATER TREATMENT PLANT

TEXTILE INDUSTRY

Physical + DAF + Biological (MBR) +
Sludge Dewatering

WASTEWATER RECYCLING PLANT

Filtration + Reverse Osmosis + ACF

1.500 m³ / day

TÜRKİYE 





LET'S **SAVE**
THE WATER
TOGETHER

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