

ESLI

Pollet Water Group

WATER & WASTEWATER TREATMENT SYSTEMS



'WE HAVE THE EXPERIENCE'



Certificates

- Quality management system ISO 9001: 2008
- Quality management for medical devices system ISO 13485: 2003
- Environmental management system ISO 14001: 2004 certificate
- CE 93/42 certificate of conformity
- OHSAS - 18001 Occupational health and safety management system
- CE Ultrafiltration 2006 42 EC

INDEX

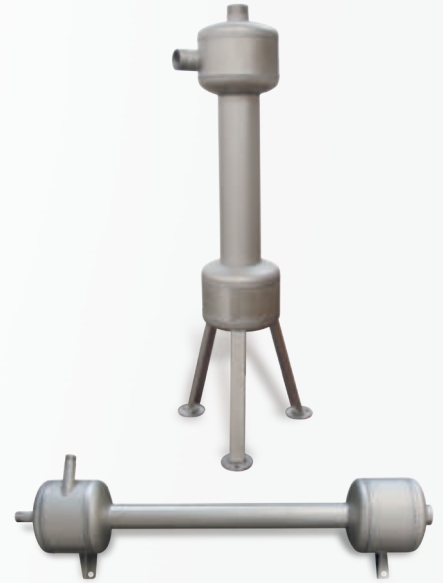
3 FILTRATION SYSTEMS 5 SOFTENING FILTER SYSTEM 6 REVERSE OSMOSIS SYSTEMS
6 ULTRAFILTRATION SYSTEMS 7 WASTE WATER SYSTEMS 7 ULTRAVIOLET SYSTEMS
8 GREY WATER SYSTEMS 8 MBR SYSTEMS 8 DEGASIFIER SYSTEMS 9 EDI SYSTEMS
9 CONTAINER RO SYSTEMS 10 SURFACE WATER TREATMENT SYSTEM WITH LAMELLA CLARIFIER
11 PRESSURIZED STEEL TANKS

FILTRATION SYSTEMS

Separator Filters

Separator Filter System works according to principle of removing solid particles which have higher specific gravity than water away from water by centrifugal forces.

- Holds all particulates between 70-110 micron. Works in high capacity range.
- Water production continues even during cleaning.
- It does not need spare part because there is no moving part inside. Filter material is made from SS304 stainless steel or St-37 carbon steel.
- Pressure loss is fixed; there is no change at high flow capacity.
- Maximum operating pressure is 8 bar.
- There is no risk of plugging as there is no filter element.



Cartridge and Bag Filters

AQUALINE Cartridge Filter Systems consist of filter body and cartridges. Filter body is the house for main element-cartridges that will filter water. Cartridges have different micron sensitivity. For this reason, for different capacities, it is possible to do sensitive filtration according to filtration degree, quantity and special applications.

Raw water parameters affect service life and thus fouling period of cartridges. Exhausted

cartridges should be changed since they cause both increasing amount of pressure loss and decreasing in filtration sensibility and quality.

Bag Filter Systems consist of filter body and bag filters. Filter body is the house for main element- bag filter that filter water. Liquid flows from inside to outside and all particles and dirt remain inside bag filter. Bag filters are generally exchangeable type but sometimes can be washed when it is clogged.



Multimedia Filters

Multi Media Filters are used for purpose of removing suspended solids, turbidity and impurities like iron and manganese.

System is generally consisting of different sized gravels and anthracite inside the body. Sometimes special filling materials will be used according to water quality to be filtered. For example, for more turbid waters or surface water filtration like river or seawater, turbidex-

anthracite or garnet - turbidex - anthracite combination will be used.

Second duty of Multi Media Filters is to protect the equipment that will be located downstream. Multi Media Filters are used as a pre-treatment step for process water and drinking water applications or sometimes used for removal of turbidity coming from wastewater treatment systems.



Iron and Manganese Filters

Aqualine Iron and Manganese Filters are used to remove iron and manganese which can be found high in water supplies by means of special minerals. Generally required quality, for drinking water is $Fe=0,2ppm$ and $Mn=0,05 ppm$. Our special minerals don't require regeneration chemicals. Beside this,

these filters can remove hydrogen sulphite, metan, free carbon dioxide available at water and organic wastes at high concentration.

Since human health is priority in aqualine filtration systems, water filtered with these minerals are suitable for human consumption.



Activated Carbon Filters

Activated carbon filters are used mainly for chlorine removal but also used for removal of dissolved gases and organic compounds that give undesirable colour, taste and smell to water. Activated carbons can be made from coal, coconut and wood but they have very wide surface area (1000-1500 cubic meter / gr). Productivity of activated carbon filter is determined by features of activated carbon used in filter, raw water quality and correct selection of filtration velocity.

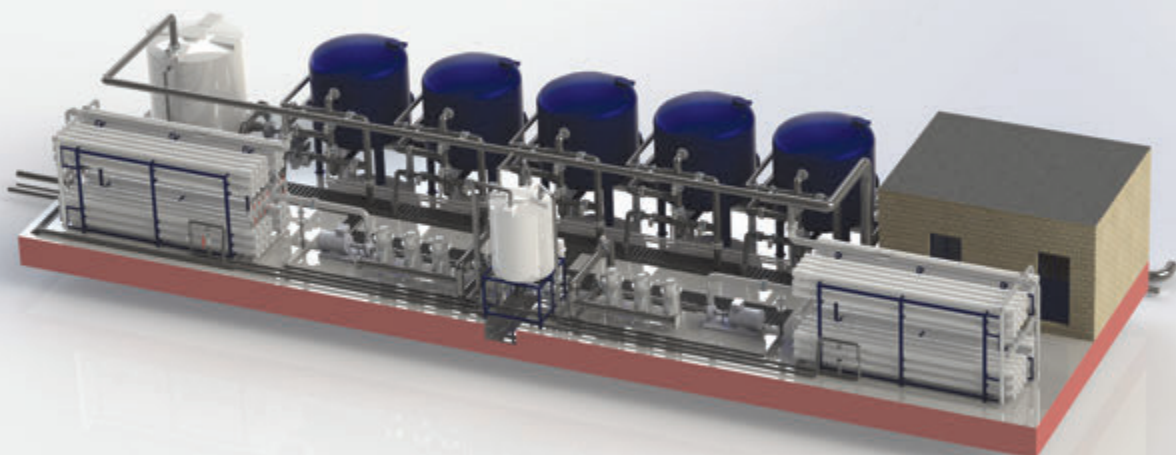
Activated Carbon Filters can be regenerated at site but generally only daily backwashing will be done due to economic reasons. Although activated carbon filters are used for removing organic materials, they are also an excellent place for growing of bacteria found on inlet water. Therefore microbiologically unsafe waters shouldn't be filtered by activated carbon. If this is the case, than suitable disinfection method should be selected as a pre-treatment step.



Face Piping Multimedia and Activated Carbon Filter Systems

Multi Media Filters are generally used for purpose of removing suspended solids, turbidity and other impurities like iron-manganese.

Standart control valves don't have enough capacity to handle high capacities more than 20 m³ - hour, therefore surface piping method will be used for multimedia filter systems and activated carbon systems.



900 m³/h Reverse Osmosis Water Treatment System

SOFTENING FILTERS SYSTEM



Water softening process is a typical ion exchange method. Ion exchange is accomplished by passing water having suitable velocity through the resin bed and Na^+ inside the resin will be exchanged with Ca^{2+} and Mg^{2+} in the inlet water that cause hardness. After certain amount of time or quantity of water passed through resin media, resin particles are completely covered with hardness minerals.

At this time a regeneration step is required to continue softening process. In regeneration step, brine solution will be given over the resin, calcium (Ca^{2+}) and Magnesium (Mg^{2+}) ions leave the resin and sodium (Na^+) ions again combine to resin due to affinity and the resin will be ready for the next service.

While designing AQUALINE Water Softening Units, resin quantity is calculated according to raw water characteristics, average daily flow and peak flow consumptions. Beside this, regeneration process can be controlled according to time, capacity or/and quality.



Surface Piping
Duplex Softener Systems
with Epoxy Painted St-37 Tank



Single Softening
Systems



Surface Piping
Single Systems with FRP Tank

REVERSE OSMOSIS SYSTEMS

Reverse osmosis process is the reverse of natural osmosis which can be explained as the movement of water from low to high concentration. It is also called as hyper-filtration that removes ions from water. Reverse osmosis is generally applied in areas where other technologies become insufficient (seawater, well water with high conductivity etc.)

When the water passes through the membrane, an osmotic pressure is created by the membrane against to flow. Therefore a high pressure pump is required to pass water through the membrane. Only water molecules can pass through the membrane and the other ions will be rejected to the drain.



AQUALINE Reverse Osmosis Systems can be divided into two groups, brackish and seawater systems. They are also divided into groups according to application areas like domestic, commercial and industrial.

ULTRAFILTRATION SYSTEMS

UF systems are used very commonly for pre-treatment of sea water osmosis systems, waste water recycling projects and pre-treatment of reverse osmosis system.

UF systems are physical treatment systems that filter out unwanted substances suspended in water, oxidized ions like iron-manganese and aluminium. They have a filtration degree of 0,02 micron.

Additionally, UF systems are used successfully for food and beverage process, bottling water process, disinfection of water indirectly and lots of special projects. Nowadays, it will be the only filtration system for wastewater recycling systems that will protect the downstream equipments



UF Membrane pore diameters are smaller than microorganisms dimensions. Although they are not a disinfection system, they are a superior barrier against bacteria.

WASTEWATER SYSTEMS



Package

The operation principle of Aqualine wastewater treatment systems is "sequencing batch reactor (SBR)" system which is the most suitable technology for treatment of domestic waste water. The main advantage of SBR system is that aeration and sedimentation will take place in the same tank.

The wastewater collected within the equalization tank is separated from the solid contaminants by means of a basket type fine-meshed screen located at the inlet section of the system. Within the sequencing batch reactor, the organic contaminants in the waste water are converted to CO₂ and water by the help of aerobic bacteria.

Concrete

In order to achieve this reaction, the necessary oxygen and mixture-air are provided by the blower included within the unit. The air produced by the blower is distributed into the tank equally through rubber membrane diffusers creating the micro bubbles. After aeration step, sedimentation step starts and treated wastewater and activated sludge is separated by gravity.

The treated water is discharged through the use of submersible pump and during the discharge the treated water is disinfected by dosing sodium hypochlorite with the dosage pump.

ULTRAVIOLET SYSTEMS



Disinfection with Ultraviolet Systems will be done by making microorganisms inactive without adding any chemical or oxidant to water.

This ultraviolet lights breaks the DNA structure of microorganisms and makes them inactive. By this way, %99,9 average ratio of disinfection is achieved. To be able to kill microorganisms with this system, Ultraviolet light must directly contact with them within a specific time. For this reason, before water enters to ultraviolet system, parameters such as sediment, turbidity should be removed from water. Sand filter or cartridge filters or mechanical filtration systems are recommended to be used before ultraviolet. To obtain good productivity from ultraviolet units, periodical maintenance is important. Changing the UV lamp once a year and Quartz glass cleaning depending on raw water quality should be made periodically.



GREY WATER SYSTEMS

Wastewater nowadays is divided into two categories; black water and grey water. Due to low nutrients level, the greywater treatment will be less costly to treat and also no need to supplementary disinfection after treatment. Greywater is generated from wash hand basins, showers and baths, which can be recycled on-site for uses such as WC flushing and also can be used for water gardening and car washing. Greyline Grey water treatment plant technology is based on Aqualine PTFE MBR systems.

They are generally ready-to-use systems but tailor-made design can also be done for end-users or system suppliers.



MBR SYSTEMS

MBRs are suspended growth systems that rely upon membrane filtration for liquids/solid separation prior to discharge of the treated effluent. Thanks to MBR, it can be overcome high energy consumption without compromising in water quality. Membranes can be used to remove: pathogens, colloids, fine particles, dissolved organic components, organic micropollutants. Advantages of MBRs over conventional processes include; small footprint, easy retrofit and upgrade of old water treatment plants.



DEGASIFIER SYSTEMS



Degasification Systems are used for removing dissolved gases such as carbon dioxide (CO_2) and Hydrogen Sulfur (H_2S) from water.

For the removal of dissolved gases from water, water enters into degasifier unit from distribution diffuser at the top of it. As water moves downward, it will be divided into small pieces by means of rushing rings in the degasifier tower. At the same time air is provided by a fan from the bottom. When the air and water contact each other, gases inside water are removed and degassed water will be collected at the bottom.



EDI SYSTEMS

EDI is a continuous electro-chemical process of water purification where ion specific membranes, mixed bed resin and a DC voltage across them, replace the standard acid-caustic chemical regeneration process. An EDI Cell consists of a series of thin chambers that alternately contain mixed bed resin for water purification and a concentrate water flow to carry away impurities. Ion specific membranes, cationic on one side and anionic on the other, separate the chambers.



A cationic-specific membrane is for negatively charge ions. An anionic-specific membrane does just the reverse.

- Power / Utilities
- Biotechnology / Pharmaceuticals
- Semiconductor / Electronics
- Surface Finishing (Automotive, etc.)
- Consumer Goods & Cosmetics
- General Industry

CONTAINERIZED SYSTEMS

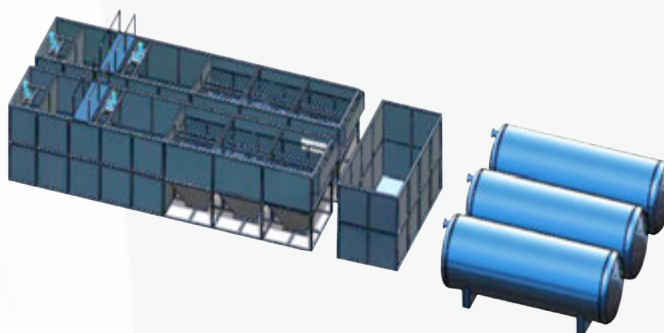
ESLI Water Treatment Company providing a high quality water treatment system with cutting-edge technology and top-of-the-line equipment to exceed the newly developing requirements of the industry products have earned an industry-wide reputation in the world and is existing within the structure of Pollet Water Group, which has been supplying both component parts and complete systems to companies specializing in the field of water treatment throughout Europe, Africa and the Middle East, since 2003.

ESLI Aqualine Reverse Osmosis Systems can be delivered completely in one or more containers, depending on the capacity of system. According to the requirements of the end user, the container may come with the thermal insulation, sound proof and air conditioning.



SURFACE WATER TREATMENT SYSTEM WITH LAMELLA CLARIFIER

The core of this systems is the placing lamella plates as much as possible with a right angle and distance in a specified area. This design allows the “settling area” or surface area 10 times bigger than the standart clarifiers having the same dimensions.



PRODUCT FEATURES

Based on physical and chemical treatment Aqualine surface water treatment system has Two standard systems having capacity of 50 m³/h and 100 m³/h; For higher capacities, custom designs can be made with using multi-systems or different lamella modules. Corrosion - resistant and completely submerged PVC plates are installed at 55 degree for optimal solids settling. Self-cleaning plates and no moving parts means low maintenance costs. Space-saving footprint allows for efficient use of land.

APPLICATIONS

These compact treatment systems, which includes pre chlorination, coagulation-flocculation, lamella clarification, sand filtration and post-chlorination, can be used ideally in which require separation of suspended solids, leaving effluent clear for discharge.

The raw water will be collected from Iraqi rivers or other freshwater aquatic ecosystems, in order to produce potable water for several domestic purposes. (human consumption and other common uses).

THE TREATMENT LINE OF THIS WATER TREATMENT PLANT INCLUDES:

1. PRE - CHLORINATION

The pre-treatment of raw water with chlorine previously to sedimentation or filtration is a very necessary operation, in order to obtain a quality for the treated, according to the WHO standards.

2. COAGULATION - FLOCCULATION

The aim of flocculation-coagulation process is to remove the very thin particles, called colloids that are very important water constituents. They cause turbulence and a lot of times form stable colloidal suspensions.

3. LAMELLA CLARIFICATION

The clarification of the raw water after chemical treatment is usually carried out by gravity sedimentation. In order to reduce the required sedimentation surface, it is very common to use lamellar sedimentation. Effectively, in contrast to

conventional sedimentation, lamella sedimentation offers a high sedimentation surface when available terrain surface is reduced. After sedimentation, the treated water passes to a storage tank (regulation tank), from which the water is pumped using horizontal centrifugal pumps to pressure sand filters.

4. SAND FILTRATION

The main purpose of the sand filtration is to remove all small particles and flocks that have not been removed in clarification process, in order to obtain clear water ready for public supply.

5. DISINFECTION (POST-CHLORINATION)

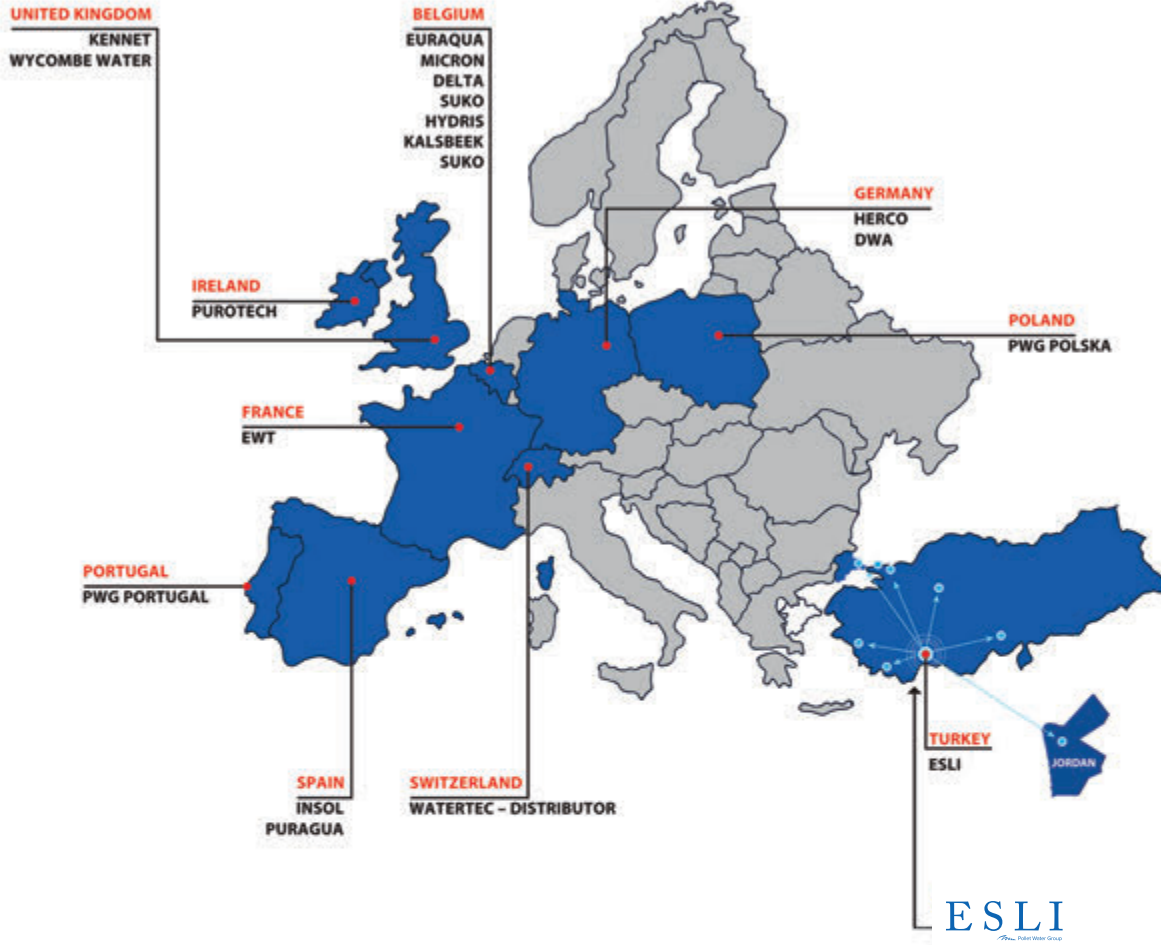
In order to ensure the final quality of the treated water, post chlorination is necessary operation; specially regarding to required residual free chlorine levels.

PRESSURIZED STEEL FILTER TANKS

We continue to improve ourselves in the production of pressurized filtration tanks with the implementing new technologies since 1997. We make smooth production which are consistent with TSE standards with our new submerged arc welding machine and new cylinder.

We can produce tanks up to 3000 mm diameter with our high technology machines. We can produce St-37 carbon steel and SS 304- SS31 6 stainless steel tanks. Also we can produce CTP - EBONITE - GALVANIZE applications inlet structure to tanks according to customer requirements.





THE POLLET
WATER GROUP
AROUND THE
WORLD

ESLI
Pollet Water Group

www.esli.com.tr
esli@esli.com.tr