

25
years
OF SUSTAINABLE
DEVELOPMENT

DESCRIPTION

The wastewater treatment plants (WWTP) developed by Premier Tech Water and Environment are based on activated sludge process, on a Sequential Batch Reactor (SBR). The pollutants are removed from the wastewater through microorganisms that are situated on the reactor, and converts them into biomass. For this biological process to occur oxygen (supplied by blower) and food (that are present on the raw wastewater) are required. After the biological treatment is finished, the content of the reactor is settled, in such a way that the activated sludge is kept inside the reactor and the treated water is discharged. These two steps (biological reaction and settling) are performed only in one tank (SBR principle).

The complete system consists on a two chambers process, where the first one has three main functions: primary settler, buffer and sludge digester. The second chamber acts as the SBR reactor, when biological reactions and secondary settling is performed.

ADVANTAGES

- Reduced transport costs
- Quick to install (supplied with assembly manual)
- Easy to adapt to existing tanks
- Control cabinet (factory assembled)

MAIN APPLICATIONS

- Municipal wastewater
- Hotels and camping parks
- Commercial and office buildings
- Industries (domestic sewer treatment)
- Recreational areas

RANGE

Solutions from 3,75 to 37,5 m³/day

EFFICIENCY

The system is dimensioned to achieve an efficiency that meets the discharge values that are required. The following table gives the standard design parameters and the discharge values.

Parameter	Value	Unit
Daily specific inflow	150	Liters/Person equivalent. day
Organic load (BOD ₅)	60	Liters/Person equivalent. day
[COD] discharge	125 (75-80% removal*)	mgO ₂ /L
[BOD ₅] discharge	25 (90-95% removal*)	mgO ₂ /L
[TSS] discharge	35 (85-95% removal*)	mg/L

* Other treatment efficiency can be achieved, in that case, please contact us.



TREATMENT CYCLE

A normal treatment cycle has a duration of 8 hours (3x times per day) and has the following steps:

A FILLING FASE

The income wastewater, that is present on the buffer zone, is elevated by an air-lift pump to the reactor, until the cycle volume is reached. This volume is also needed to accumulate the income wastewater during the reaction and settling phase. If the water level is low (not enough for a normal reaction cycle with discharge) the system will only aerate the reactor and not proceed with the discharge.

B REACTION FASE

In this phase, oxygen is introduced into the reactor to promote the mixing and the biological reactions, in order to biodegrade the influent pollutants. The fine air bubbles are introduced by disc diffusers that are connected to an external blower. The compressed air, besides giving the required oxygen, also makes a perfect mixing of the reactor content, enhancing the contact between the microorganisms and the food.

C SETTLING FASE

Along with the reaction phase, this is one of the most important step on the treatment process. After the reaction, the aeration stops for the activated sludge settle in the bottom of the reactor, and the clean water, free of solids, stays on the top of the reactor. During this phase, since there is a physical separation between the reactor and the incoming water, the perfect conditions for a good solids separation are created.

D TREATED WATER EXTRACTION FASE

After the settling period, the top content of the reactor (clear water) is removed to his final destination, through an air-lift pump.

E EXCESS SLUDGE RECYCLE FASE

The excess sludge produced on the reaction phase is recycled by an air-lift pump back to the first compartment, where this recycled sludge and the primary sludge suffers a cold digestion, reducing their volume. After a pre-determined period, this sludge must be removed (extracted).

SYSTEM COMPONENTS

To perform the full treatment cycles, the following components are used:

- Two tanks in concrete, plastic or other material, with the required volume and height
- Air-lifts pumps, that uses the air of the blower to moves the water between the chambers, not needing pumps inside the tanks
- Fine disc diffusers and a network to connect them to the blower
- Blower to supply oxygen to the reactor and air to the air-lift pumps
- Control panel with valves, that is responsible for all the control of the entire system cycle

All the components are made with durable materials and build to realize the waste water treatment process.

The full system is supplied as a kit with all installation instructions, so it can be easily assembled in any type of tank. It can be installed in new facilities and also to upgrade existing facilities to improve the quality of the treated water.

