ACTIVATED SLUDGE WASTEWATER TREATMENT PROCESS

Bacteria culture is used in a controlled manner in biological wastewater treatment plants. The live bacteria community in the biological reactor tank is shortly defined as "activated sludge". Living microorganisms in the activated sludge tank use the organic matter in the wastewater as food in order to reproduce. During this process, the microorganism community also uses oxygen to burn organic matter in its body. As a result of the burning of oxygen and organic matter inside the cell, carbon dioxide and water are formed.

The oxygen needed by the living bacteria community is transferred to the aeration tank (biological reactor) by an air blower through diffusers laid on the bottom of the activated sludge tank. The purpose of the diffusers is to give the air given to the tank in small bubbles to facilitate the passage of oxygen to water. The air particles coming out of the diffusers on the aeration tank bottom also prevent the activated sludge in the tank from settling, allowing the sludge to remain in a complete mixture. The process that the aeration continues is actually the wastewater treatment process of the bacterial culture. At the end of this process, the live activated sludge bacteria culture in the reaction tank is left to settle by turning off the blower. At the end of the settling period, the treated water remaining on the tank is given to the receiving environment by a discharge pump. Microorganism activity that may occur in the wastewater is prevented by adding liquid chlorine (sodium hypochlorite) via the dosage pump during the discharge to the treated water. At the end of the Filling - Aeration - Settling and Discharging process, the system returns to the beginning and the same treatment processes are repeated continuously.

PACKAGE TYPE BIOLOGICAL TREATMENT PLANT

Package type biological wastewater treatment systems operating on the basis of sequential batch activated sludge process consist of the following units.

1. Pre-Settlement Chamber
2. Balancing Chamber
3. Feed Pump
4. Biological Reaction Tank
5. Blower
6.Discharge Pump
7.Chlorine Dosage Unit
8.Automation Panel

Pre-Settling Tank

It is the first entrance to the treatment facility. It is the section where the coarse-grained collapsible solid particles that cannot be treated biologically in the wastewater are collected at the bottom of the reservoir and the particles remaining on the surface are collected on the surface of the reservoir. If there are biodegradable substances in the collapsed and floating materials, they do not cause excessive accumulation on the bottom or the surface of the chamber as they mix with water as decomposed over time. The solids that cannot be treated biologically and that accumulate in the chamber are removed from the chamber by pulling with the vacuum truck. Solid-free waste water is taken from the reservoir to the balancing reservoir. Thanks to this reservoir, the treatment plant diffuser lines and the pumps etc. operating in the system is prevented from being damaged by solid materials.

Balancing Tank and Feed Pump

The wastewater passing through the pre-settling tank is collected in the balancing tank and a homogeneous wastewater mixture is provided. At the same time, the balance tank prevents wastewater from entering the aeration tank with peak flows. In order to transfer the wastewater accumulated in the balancing tank to the package unit, a septic submersible feed pump is installed in the balancing tank.

Biological Reaction Tank

It is the section where the biological treatment of domestic waste water is provided. Filling - Ventilation - Settling - Draining - Disinfection processes are performed sequentially in the package unit. Organic substances in the wastewater entering this compartment will be converted into carbon dioxide, water and other metabolic products and new activated sludge microorganisms by the activated sludge mass during the aeration phase. The oxygen needed by the system is supplied by the blower through the distributor pipes at the bottom of the tank. In the sedimentation phase, the activated sludge will separate from the biologically cleaned treated water and settle on the bottom of the tank. The treated water remaining on the surface is taken by a submersible pump, chlorinated and transferred to the clean water tank. These operations are automatically repeated with level control and control panel.

The package unit has a by-pass system to prevent any blockage of the diffuser line that supplies oxygen to the system. Diffuser blockages can be removed very easily and quickly thanks to the existing system.

TECHNICAL SPECIFICATIONS		
Equivalent Population	**Daily wastewater flowrate (m^3/day)**	**Dimension Width x Length x Height (cm)**
25	5	120 x 240 x 180
50	10	180 x 280 x 260
100	20	200 x 380 x 260
150	30	200 x 500 x 260
200	40	220 x 600 x 260
250	50	235 x 620 x 260
300	60	235 x 680 x 280
350	70	235 x 720 x 280
400	80	235 x 820 x 280
500	100	235 x 1000 x 280
600	120	235 x 1185 x 280
750	150	235 x 1250 x 280
1000	200	235 x 1350 x 280