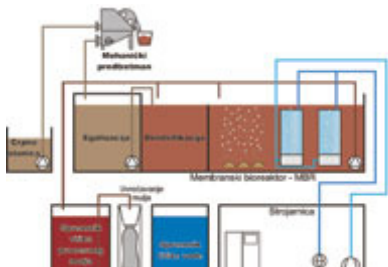


Process data

MBR plant can be made as modular skid mounted system in order to simplify the construction, or built. MBR plant as a building for the same characteristics of the effluent can be built as underground or surface type. It only depends on the wishes of investors and the location of the plant.



The plant consists of the following equipment and buildings:

- coarse and fine mechanical screen (3 - 0,5 mm)
- pump station
- influent equalization basin
- MBR bioreactor basins (denitrification, nitrification, separation area)
- sludge stabilization basin
- effluent control tank
- machinery compartment with control panel

Picture 1. Operating principle of MBR process. The coarse mechanical screen and the fine screen are designed to meet large scale of fluctuation of influent, as well as all the discontinuity of incoming flow during the operation.

Once the mechanically separated solids reach the fine screen, they are automatically stored in standardized containers. Protection from odor is enabled through completely closed course of mechanical particles from screen to container.

The equalizing basin has the purpose of equalizing the influent quantity. Combined with MBR basins, it is design to meet the process requirements regarding the quantity and concentration of influent wastewater. For each type of influent it enables optimal type and setup on the entrance in MBR basins.

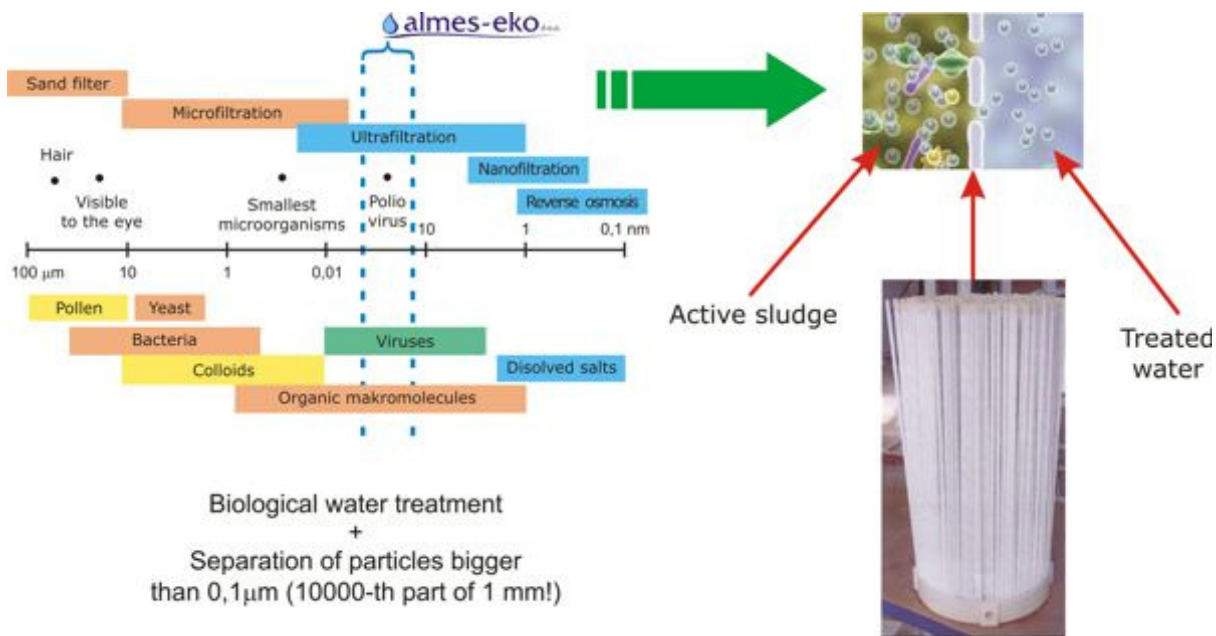
Membrane bioreactor (MBR) combines classical bio-treatment with active sludge and membrane separation technology, thus creating process configuration which is simple to use and maintain, rentable, flexible and reliable. Small reactor zone inside the MBR process is the mean and the place where the biomass is periodically exposed to environmental conditions suitable for optimal growth. From the anoxic zone the biomass enters the aerobic reactor zone. In this zone with anoxic conditions the process of de-nitrification takes place undisturbed, and in the same time serves as a mean to minimize the growth of filamentous microorganisms.

MBR plant does not require nor primary nor secondary sedimentation tank (secondary clarifier), and MLSS, as important characteristics of aerated reactors with bio-sludge, is 3 to 5 times higher than in classical treatment; consequently the reactor basins are much smaller. Because of that, the area for construction of MBR plant is even to 3 times smaller compared to the one necessary for classical biological wastewater treatment plant, thus not affecting the quality of purified water.

The reactor for aerobic sludge stabilization is designed to quantitatively ensure sludge treatment and sludge aging required by the process, even in the conditions of maximal influent flow. The sludge from the stabilization basin is pumped out periodically and taken to the landfill, or it can be further treated (sludge de-watering).

The basin for effluent control is integral part of exit unit, and it is designed to accept the effluent for visual and on-line control of NTU turbidity, and for collecting samples for laboratory testing of effluent characteristics. During the back-wash of membranes the small quantity of diluted sodium hypochlorite (NaOCl) is automatically added. The water inside the effluent control basin is treated, and it can be used as technical water or for irrigation.

This kind of MBR reactors system assures the operation for each and every influent quantity, as well as for each oscillation in influent concentration. The biological process inside the reactor provides the same effluent qualities at all times, no matter the quantities and concentrations of influent. Submerged membranes with pore size of 0,1 (Picture 2) make integral part of the reactor.



Picture 2: Possibilities of membrane separation