

Wastewater Reuse

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... based on membranes

A waste water reuse concept should be implemented under three key criteria:

- Conservation of Species
- Conservation of Resources
- Pollution Control

WHY REUSE WATER?

- Recycled water displaces potable water
- 50-70% of water used in household doesn't require drinking water quality
- 80-90% of water use in commercial buildings could be sourced from recycled water supply
- Recycling water = reduced pollution of streams, rivers and oceans (coastal areas – bathing water)
- Why we throw away good water...?
- On islands or arid areas water is a rare source, especially during the tourist season.



COST ASPECTS

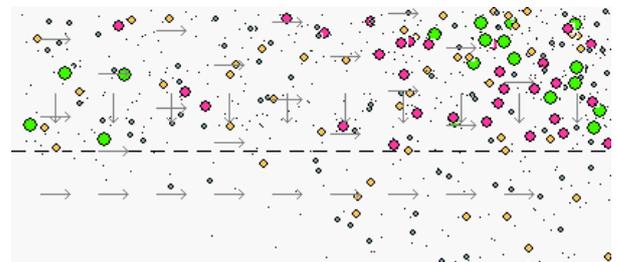
- Investment cost of an enhanced treatment with MBR technology are about equal to conventional waste water treatment plants (WWTP)
- Operational costs are slightly more expensive than in conventional WWTP.
- Reuseable water is produced at costs of 0,30 €/m³ and it might replace potable water
- Reused water is cheaper than fresh drinking water but it possesses a definite value!

LIMITS

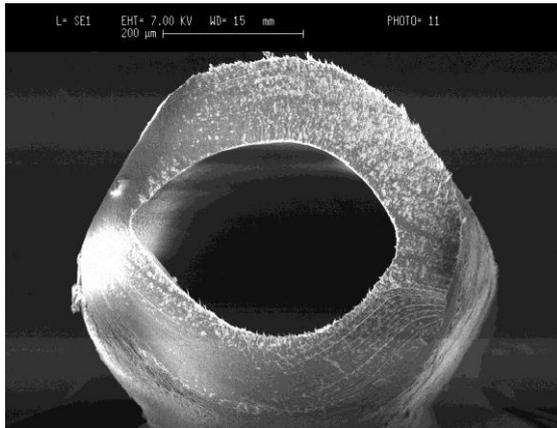
- The technology is well established up to a size of 20.000 PE

Membrane Filtration

To produce wastewater in a quality superior to the minimum effluent standards the application of membrane modules is the state of art. Membrane technology belongs to the pressure driven filtration processes. In wastewater plants nanofiltration, ultrafiltration, microfiltration and reverse osmosis technology is used.



Membrane modules

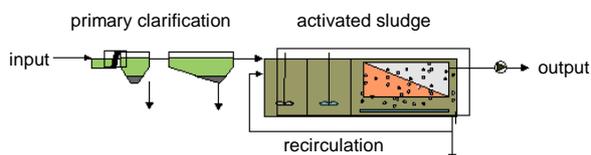


(Cross-section of a hollow fibre membrane, scanning electron microscope)

Several types of modules (hollow fibre, flat e.g.) and different types of materials (ceramic, plastic e.g.) are used in membrane filtration technology. This assures an optimal solution for any purification task.

Membrane Bioreactor (MBR)

A Membrane bioreactor is a combination of conventional purification technology (bio-reactor) with a filtration unit, they are used both in industrial and communal wastewater treatment.



The advantages are:

- Higher purification capacity
- Savings in space and construction work
- Modular design
- Lower investment costs
- Better water quality
- No pathogenic bacteria and germs
- Effluent is free of suspended solids and perfectly suited for further treatment for special needs (boiler feed water, drinking water)

In addition to that the so produced pure water fulfills both default and stipulated values of the EC guideline on bathing water quality.



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