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## **Examinations concerning the retention of bacteria with MicroClear membrane filters of Weise Water Systems**

Within the scope of a research program financed by the BMBF (german ministry of education and research) we make use of different MicroClear filters for the retention of biomass in a membrane bio reactor (MBR).

The membranes used with the MicroClear filters are ultrafiltration membranes with a molecular Cut-off of 150 kDalton, this equals approximately a pore size of 0,05  $\mu\text{m}$ . This means, that bacteria (size 1 - 2  $\mu\text{m}$ ) and parasites (size 5 - 50  $\mu\text{m}$ ) are separated safely.

The experimental data, shown in table 1, confirm the theoretical thoughts.

Tab. 1: Effluent quality of the membrane bio reactor compared to that of the municipal sewage treatment plant Giessen and influent data.

| Parameter            | Influent (from pre-sedimentation) | Effluent Membrane Bio reactor | Effluent MSTP Giessen |
|----------------------|-----------------------------------|-------------------------------|-----------------------|
| Colony forming units | 300.000 CFU/ml                    | 1- 1000 CFU/ml                | 10.000 CFU/ml         |
| Coliforms            | 4.000.000/100 ml                  | Not detectable                | 30.000 / 100 ml       |
| Escherichia coli     | 2.000.000/100 ml                  | Not detectable                | 20.000 /100 ml        |

Since the plant is not operated under sterile conditions, bacteria in the effluent is commonly found due to regrowth. Note: Even drinking water is not free of bacteria; the old government regulation for drinking water allowed for 100 CFU/ml and 1000 CFU/ml onboard ships. Faecal germs like E-coli could not be detected. The obtained data corresponds with other membrane treatment plants. When using a Membrane bio reactor, the effluent normally has the quality of bathing water according to EU-regulations.

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