



Kilian Water Ltd. has more than 15 years experience with sustainable wastewatermanagement.

We **design** and **establish** planted filter systems, both in Denmark, but as well in other countries like Sweden, Holland, France, Scotland, and Bosnia and Herzegovina.

We do **research** and **development** with the Danish Environmental Ministry, municipalities, Aarhus University, and Danish Techological Institute.



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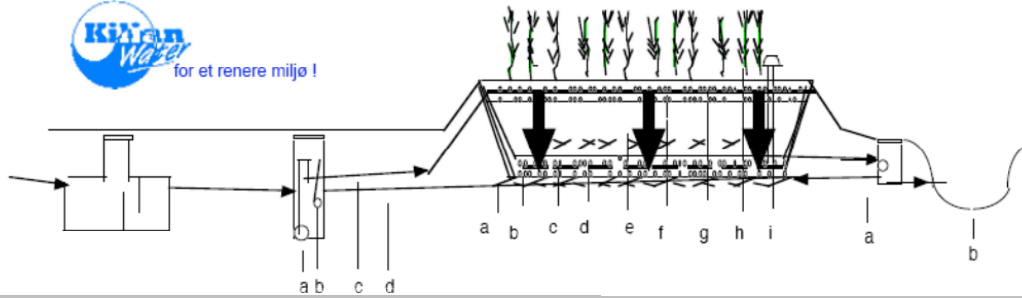
Save money on your wastewater while protecting the environment!



Planted filter - a modern kind of reedbed system with vertical waterflow and recirculation.

Planted filter has proven to be one of the best facilities, with the lowest percentage of technology and the highest proportion of nature and ecology.

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The reedbed filter with recycling system.

The principle of this system resembles very much a natural system of wetlands, and can therefore be considered as a natural system, where a person has only given the system its shape and form. The first step is of course the sedimentation/septic tank from which the waste water goes into the pumping station.

From here the wastewater is pumped in small portions (60 l) under pressure into the filter. The water passes through the root zone by gravity (= vertical waterflow), gets collected in a drain at the bottom and leaves the filter through the output drain.

Treated water can now flow into the recirculation unit. From here half of the water returns back into the sedimentation tank or pump station. The other half runs out in the existing sewer pipe/environment. The recirculation provides better treatment of nitrogen, H₂S and hydraulic load.



Septictank - Model KWH WehoSeptic, 2500 l.



Cross-section of buried septic tank

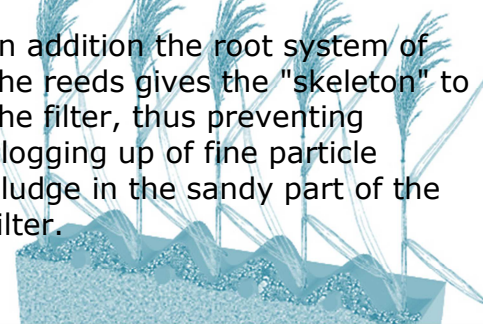
The reedbed filter itself is of course the most important part of the system where treatment takes place. It can be installed at different levels in relation to the field. This is determined on the spot, and primarily depends on the terrain and soil type.

Number of persons	Number of households	Filter area
1-5	1	16 m ²
6-10	2	32 m ²
11-15	3-4	48 m ²
16-20	5-6	64 m ²
21-25	7-8	80 m ²
26-30	9-10	96 m ²

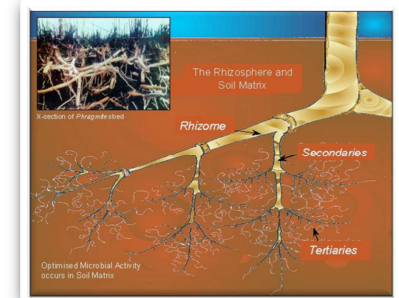
Planting reed makes this system natural and very effective. Reed plays a very large role in the treatment process, aeration and evaporation. The root of this plant is so well developed that in fact this segment is sufficient to perform the function of purification.

The aerobic phase of the treatment is among others covered by oxygen transport through the plants to the roots, where bacteria can use the oxygen in the process of the wastewater treatment.

In addition the root system of the reeds gives the "skeleton" to the filter, thus preventing clogging up of fine particle sludge in the sandy part of the filter.



Filter size, as well as other filters, depends directly on how burdened the waste water is and of course on the number of users (PE - the equivalent of a person: 60 gr. BOD₅, 13 gr. N/day and 2.5 grams P/day, with an average water consumption of 150 liters per person). The table shows the surface the filter must have to satisfy SOP class treatment. SOP means fulfilling 95% reduction of organic matter (BOD₅) and 90% reduction of ammonium (NH₄).



For each household we need 50-70 seedlings of reed plants. They have to be placed between the wastewater distribution pipes.