



# BioKube

## *Biological cleaning of wastewater.*

*Water is in many areas of the world very scarce and there is a big demand for wastewater treatment systems that will allow treated wastewater to be safely reused. BioKubes aim is to fulfill the goal: **wastewater is not a problem. Cleaned wastewater is a valuable asset**".*

### **BioKube small wastewater systems**

BioKube was created as a research company in 2003 to develop small and medium size wastewater systems that fulfilled the requirements in The European clear water directive of BOD < 25 mg/l. The systems must also fulfill the more strict Danish requirements of BOD < 10 mg/l.

The BioKube systems were put on the market as a generally available product in late 2004 and by 2008 over 2.300 systems have been installed. About 60 % have been installed in Denmark but BioKube presently has distributors in 27 countries and international sales are now bigger than the Danish sales.

**BioKube small systems for individual houses. The size depends on the number of people and the cleaning requirements.**



### **BioKube large wastewater systems.**

The same basic technology of using fixed

film technology<sup>1</sup> makes it possible to treat wastewater for up to 20.000 PE or to treat wastewater from agricultural production systems such as slaughter houses, dairies or vegetable factories.

### **BioKube system for 1.900 m<sup>3</sup>/day factory**



### **Treated waste water must be safe for nature.**

The BioKube technology was developed to treat wastewater in Europe, where there typically is plenty of water and normally no need to reuse the cleaned sewage water. The main requirement is therefore to clean the wastewater to a degree where is not harmful for the natural environment if the treated water is discharged back to the natural waterways.

<sup>1</sup> The natural bacteria that degrade organic material live on Submerged Aerated Filters as opposed to Activated Sludge systems. Submerged aerated filter technology is more stable and require less manpower to maintain and therefore they are better suited for small systems.

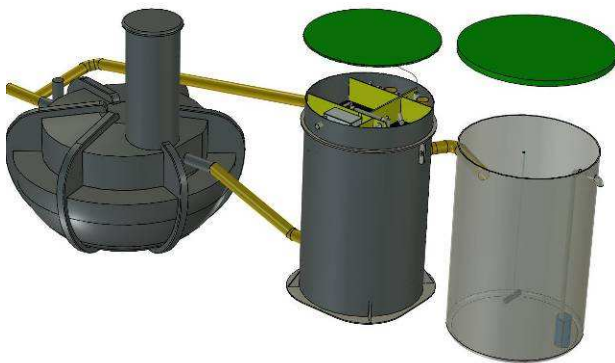
**Treated wastewater is a valuable asset and can be reused**

In many parts of the world, such as the Mediterranean or The Middle East; there is a great lack of water and consequently a big demand for reuse of the cleaned sewage water.

Reuse of the treated wastewater typically involves additional purification with UV light and/or Ozone. The purified wastewater is typically used for irrigation or car wash etc.

A BioKube small system for water reuse consists of a septic tank for pre cleaning, a BioKube cleaning unit for biological cleaning, UV lighting and a storage tank with Ozone.

**BioKube small system with UV and Ozone**



**Water reused in the desert in Kuwait.**

BioKube has sold wastewater treatment systems in containers to be used at oil production units in the Kuwait.

The systems can operate even at the up to 50 degrees found in the dessert.

**BioKube system for oil camp in Kuwait desert**



The cleaned water is used for small gardens for the workers or the water is reused for carwash or return water to the toilet buildings.



**BioKube systems provide local cleaning of wastewater in buildings in big cities.**

In many countries especially in third world countries, the sewage treatment systems in the big cities is inefficient and there is a demand for local cleaning on site before the wastewater is discharged.

This is the case in Bangkok and here BioKube has installed a wastewater treatment system in the town hall of Notamburi

Requirement was for the wastewater to be cleaned and purified with UV and Ozone so the treated water could be discharged safely to a lake in a public park.

**BioKube system in Notamburi, Bangkok.**



The system in Notamburi is installed under the slightly elevated tiles. In back of the system is a open-air restaurant for the town hall and the whole area is open to the public, so one of the requirements was absolutely no

smell and no noise from the cleaning process.

Cleaned water from Notamburi town hall is discharged into a lake in a public park so it must be absolutely secured that no harmful bacteria are left after the cleaning process.

#### **Water discharged to lake in a public park.**



#### **BioKubes simple and stable process is well suited for third world countries.**

With support of about 1 mill \$ BioKube wastewater systems will be manufactured in several developing countries. Support has been given to start production in Ghana, Malaysia and Thailand.

In Ghana the first system has been installed in Accra at the United Nations Kofi Annan officers training center.

The treated water will be reused for irrigation.

#### **BioKube system official opening UN Kofi Annan Officers Training Center.**



#### **Public toilets, Ghana.**

In Ghana there are few houses with running water and consequently no toilets. Public toilets are provided in the cities with one toilet building for men and one for women. The water is not cleaned but dumped untreated, if possible into the sea

With support from DANIDA BioKube systems will be installed in these public toilets and the treated wastewater will be reused.

#### **Public toilet in Ghana, the toilet water is stored in open air tanks.**



#### **Untreated wastewater from public toilets being dumped into the ocean.**



In Ghana, BioKubes goal, that “wastewater is not a problem. Cleaned wastewater is a valuable asset”, is easily illustrated to be fulfilled in a developing country also.