

# Decentralised Wastewater Treatment HUBER BioMem®



## HUBER Solution for Decentralised Wastewater Treatment

- Mobile and stationary units
- A variety of effluent reuse options
- All from one source

## ►► The situation

Centralised wastewater treatment plants ensure the reliable disposal of wastewater in many cities on all continents of the world. But, in the long run, also thinly populated decentralised areas need safe wastewater disposal solutions. As the costs for sewer system construction and operation are often uneconomical, decentralised wastewater treatment is gaining in importance.

A particular challenge are remote hotels and holiday resorts, small residential developments and quickly growing labour camps as common in emerging countries where the supply of water for the irrigation of green areas, fields and parks is more of a problem than wastewater disposal. In most cases, the water is still supplied by tanker vehicles, which is expensive and ecologically problematic.

The protection of eco-systems and water shortage in many areas of the world requires special, future-oriented solutions.



*Remote village*

## ►► Our solution

HUBER offers tailored complete systems for onsite solution of the customer's wastewater problem – decentralised, independent and sustainable.

The modular, flexible design of the innovative HUBER BioMem® Compact MBR System is adjustable for different local conditions and individual requirements. Designed for up to 3,000 persons the systems are available as mobile plants or stationary units, they can be installed above ground or optionally underground and are frost-proof.

Optimally applied, the innovative HUBER BioMem® Compact MBR System reduces fresh water consumption to 80%, and the clarified water can directly be reused as service water. Decentralised wastewater treatment with membrane technology guarantees clean water of highest quality where the connection to existing sewer systems is difficult to achieve and wherever there is a high demand for water recycling.



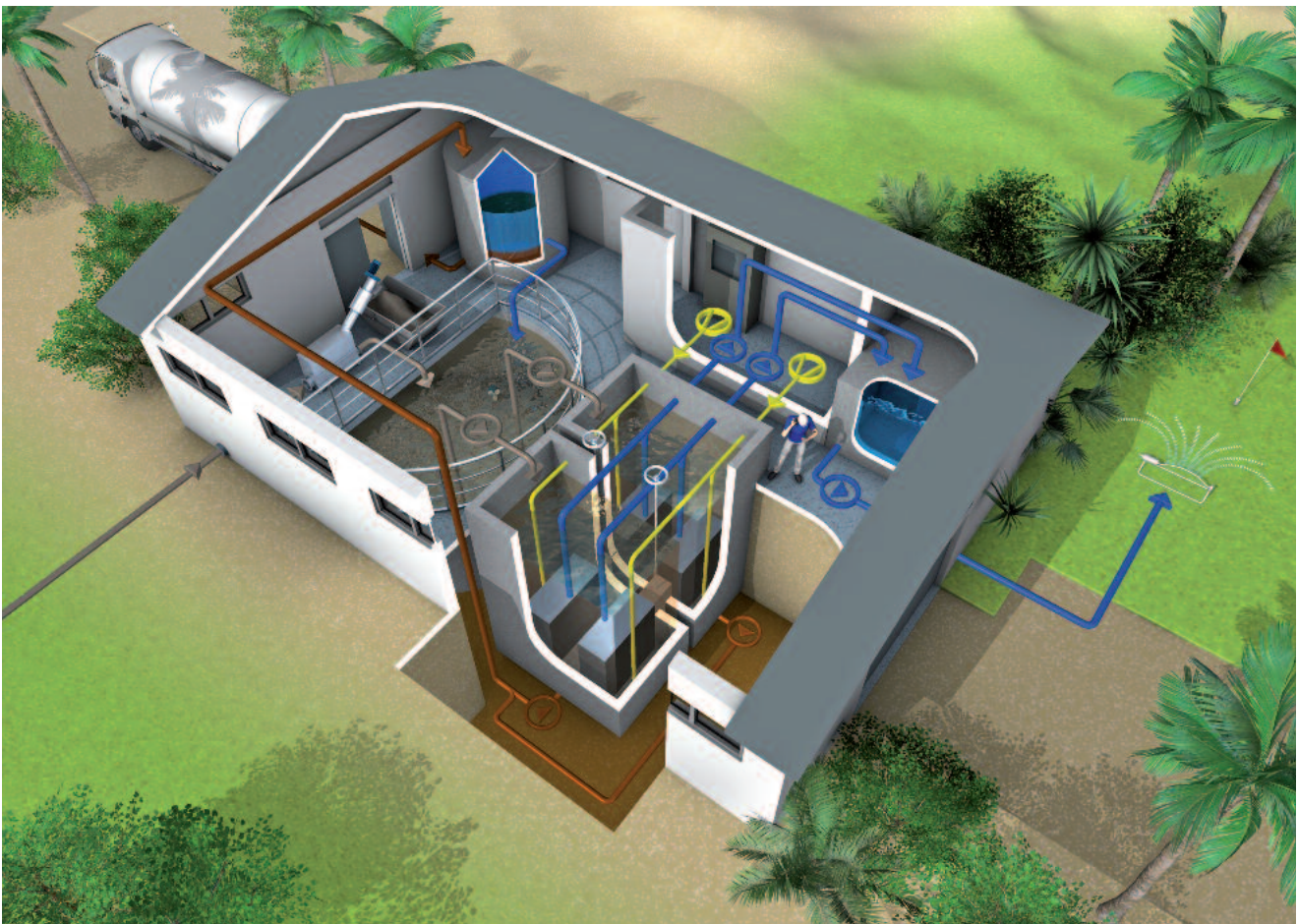
*No life without water*

## ►► Installation option “building”

HUBER BioMem® Compact MBR Systems can be situated in enclosed buildings, i.e. basements of hotels or skyscrapers, customers’ tanks or other tanks. The system components are selected to fit the specific application requirements. Associated components can be added to the basic MBR system, such as mechanical pre-treatment units, phosphate precipitation, sludge treatment and electrical control systems including data protection and remote control.

The principle of the HUBER BioMem® SMBR process (sequential MBR) is based on the combination of a conventional MBR process and sequential feeding of pre-treated wastewater. The SMBR process simplifies biological wastewater treatment and filtration within a single tank, enabled by a unique usage of the purge air both for membrane surface cleaning and oxygen supply for the microorganisms.

HUBER BioMem® modules are also used as classical filtration modules in MBR processes. The filtration unit consists of a scouring box equipped with 125 m<sup>2</sup> membrane surface. Air tubes are installed for membrane cleaning (and oxygen supply and mixing within the reactor with SMBR systems). One permeate pump per treatment line is provided for clarified water discharge and one scouring blower for membrane cleaning. All associated equipment components and electrical controls are installed in a nearby separate room.



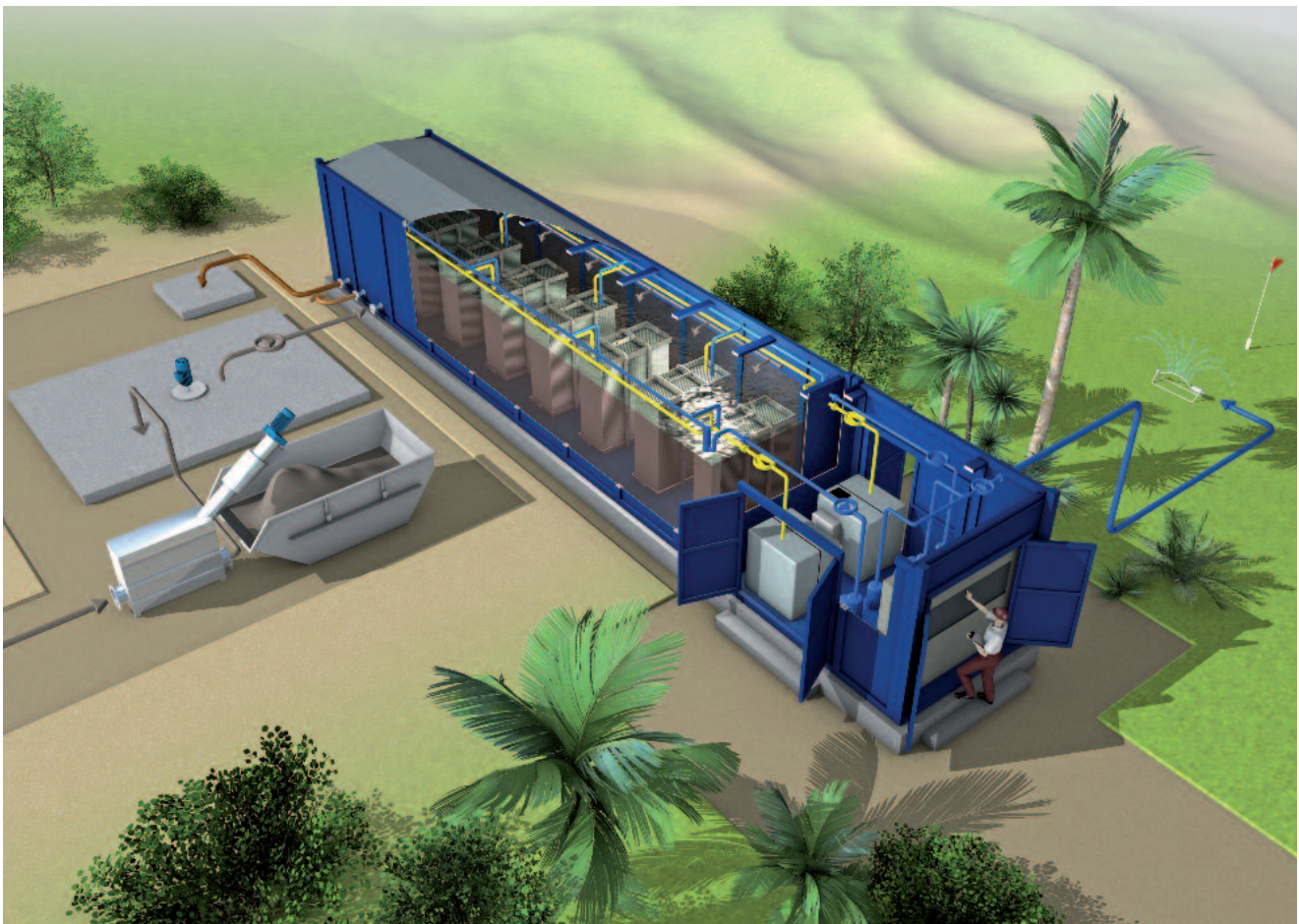
## ►► Installation option “container”

In contrast to the “building” option, the “container” installation is only available in SMBR operation mode. Biological degradation of contaminants and filtration takes place in one or more containers, depending on the throughput rate. These containers are coated on the inside and manufactured by transport standards. They are available as complete reactors to be complemented with an electrical control container, or optionally with a separate control room.

Also container installations consist of several modules that are selected to meet specific application requirements. The special feature and advantage of containerised units is their mobility. HUBER BioMem® plants therefore provide maximum flexibility of usage on different sites.

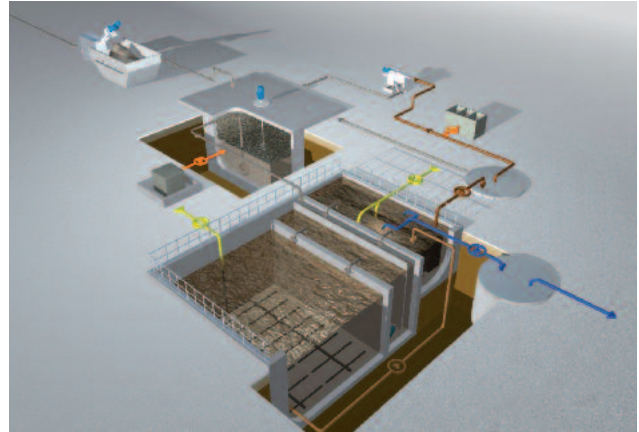
Contrary to stationary units and for lack of space and process-specific reasons, mobile units are equipped with membrane modules that provide 75 m<sup>2</sup> membrane surface. Also in this case, each treatment line is equipped with one permeate pump and one scouring blower.

Containerised HUBER BioMem® plants are supplied as prefabricated, tested and ready-to-operate units. On-site installation work and wiring is reduced to a minimum. This ensures quick installation and commissioning.



## ➤➤ MBR operation mode

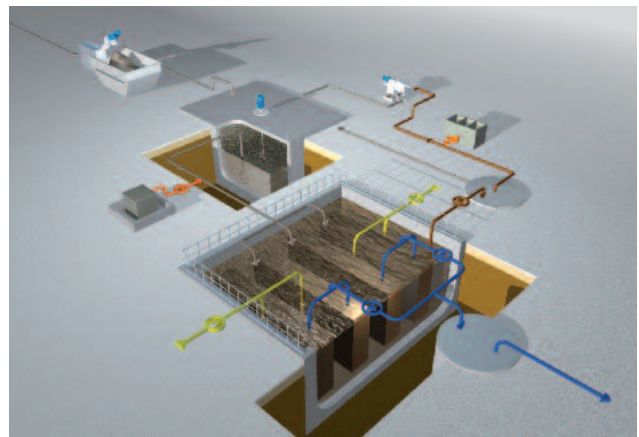
In this process variant the HUBER BioMem® modules are used as filtration step in the well-known membrane bioreactor process (MBR). The degradation of dissolved contaminants takes place within the bioreactor, prior to actual membrane filtration within the filtration chamber where the HUBER BioMem® modules are installed. The number of installed modules depends on the specific process layout tailored to fit the application requirements. One or several permeate pumps are installed for clarified water discharge and, in contrast to SMBR systems, one or several scouring blowers are provided exclusively for the purpose of membrane surface cleaning and normally not for oxygen supply.



*HUBER BioMem® – MBR operation mode*

## ➤➤ SMBR operation mode

The HUBER BioMem® SMBR principle is based on the combination of a conventional MBR process together with a sequential feed. This easily combines biological wastewater treatment and filtration within a single tank, enabled by a unique usage of the purge air within the SMBR reactor both for “mechanical” tasks (membrane cleaning), mixing within the reactor through loop flow generation and biological functions (oxygen supply for wastewater clarification through microorganisms). Air tubes are provided below the filtration unit that reduce the air intake by up to 60% compared to conventional MBR plants.



*HUBER BioMem® – SMBR operation mode*



## ➤➤ Benefits

- Comprehensive solution including mechanical treatment, biological process and sludge treatment
- Maximum effluent quality due to membrane filtration that retains virtually all germs, suitable to be reused for irrigation
- Maximum process reliability with the option for fully automated operation
- Mobile containerised units available
- The decentralised solution eliminates the need for expensive sewer building work or modification of existing public sewers
- Minimum space requirements due to the compact design and innovative SMBR process
- Reduced fresh water demand due to water reuse
- Modular design

## ➤➤ Applications

Water is the origin of all life – worldwide. HUBER BioMem® systems are therefore available in different operation and installation options, both for municipal and industrial applications. The compact units meet highest effluent quality requirements.

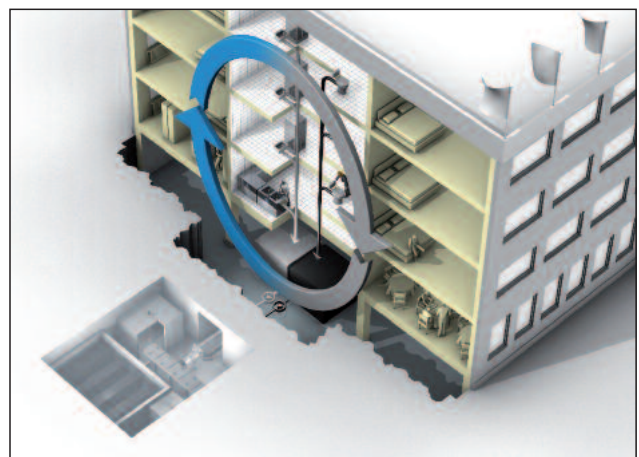
- Sewage treatment system for hotels and other tourist facilities
- Villages and residential developments
- Industry and business enterprises



*Field irrigation with treated wastewater*



*Water for aesthetic quality*



*HUBER BioMem® solution for an office and residential building*

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HUBER BioMem® Compact MBR System