

APPLICATIONS

SEMICONDUCTOR

SOLAR

PHARMA

POWER GENERATION

FOOD & BEVERAGE

PULP AND PAPER

CHEMICAL

OIL AND GAS

MINING

AEROSPACE AND TRANSPORT

RESIDENTIAL AND TOURISM



BIOFIT[®].Watercell

Containerised wastewater treatment with MBR-technology





BIOFIT®.Watercell – the transportable MBR solution

Transportable. Scalable. Effective.

With BIOFIT®.Watercell H+E provides a versatile containerised membrane bioreactor for wastewater treatment. It is designed to be fully transportable to provide a fast solution that is scalable and therefore meets customers requirements in a very flexible and effective way. Its membrane filtration technology ensures the best possible treated water quality.

Thanks to smart and compact design, the MBR systems are fitted inside mobile containers and have very small footprints for the capacity; therefore they are particularly suitable for locations where space is scarce or for modernising or extending existing plants which normally leave little room for expansion. BIOFIT®.Watercell is offered in standard sizes, with a range of flow rate capabilities. Larger capacities can

be simply achieved due to the modular construction of the BIOFIT®.Watercell systems, which allow for optimum adaptation to the specific needs of customers, whether in the municipal or in the industrial sector. The design of BIOFIT®.Watercell units enables operation at high concentrations of biomass of 8,000–12,000 milligrams per litre, ensuring highly efficient treatment of wastewater in a compact volume.



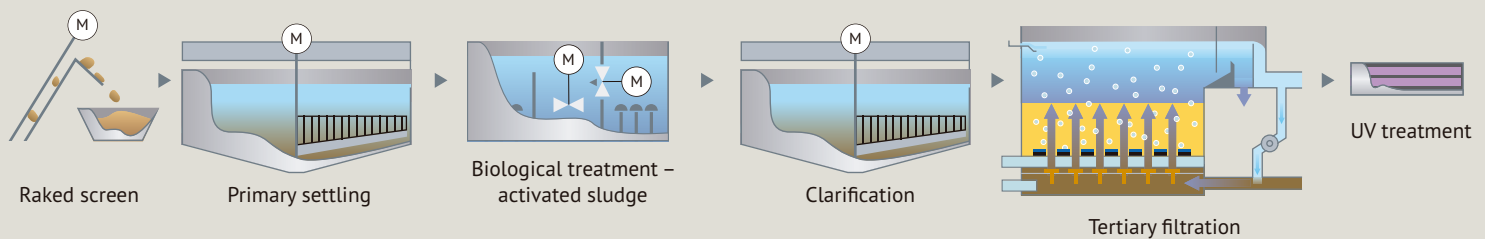
External monitoring and custom-tailored services will ensure full operational satisfaction

The BIOFIT®.Watercell process leads to a significant reduction in concentration of organic substances (BOD5, COD), as well as the elimination of more than 90% of the entire bacteria present. Thus re-use of treated water is generally possible. BIOFIT®.Watercell units are sold worldwide and can be very easily

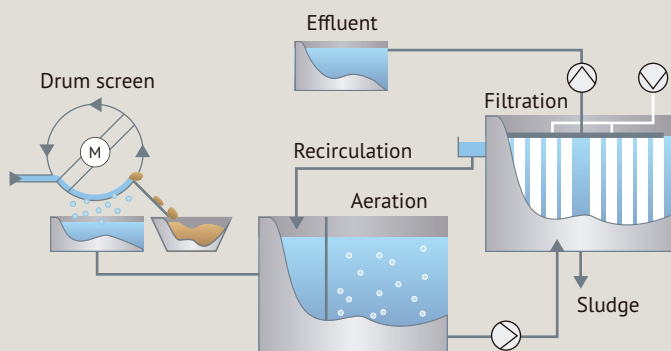
installed anywhere thanks to their “plug-and-play” concept. Operation has been largely automated and thus is simple. Furthermore, an extensive and tailored service package is offered, including optional remote monitoring of the system and, for example, alarms to mobile devices.

Process Sequence

Conventional sewage treatment steps



BIOFIT®.Watercell treatment steps



The BIOFIT®.Watercell design combines two proven and robust wastewater treatment technologies: Biological treatment with activated sludge and filtration by submerged membranes. The wastewater is collected in the customer's system and transferred to a balance tank. From there the wastewater is pumped to a 2 mm rotary drum screen usually mounted on

the roof of the plant room. The screened liquid passes by gravity into the biological treatment stage. The biological treatment tank is equipped with a fine-bubble aeration system. This performs a dual role, keeping biological solids in suspension and feeding the necessary oxygen to the aerobic reactor zone. If enhanced nitrogen removal is required, the biological treatment tank is divided into two zones, aerobic and anoxic.

In a filtration tank, submerged flat sheet membranes then separate the active biomass from the treated wastewater. This technology offers significant advantages over the conventional use of clarifiers, especially with regard to the sludge separation. Use of membranes not only leads to much longer sludge retention times, but also allows for a significantly increased concentration of solids. This results in a number of benefits: stable process, complete nitrification, lower excess sludge production and lower biological volume requirements, and improved treated water quality.

Benefits

Wastewater treated by BIOFIT®.Watercell shows very low organic compounds (BOD5, COD) and nitrogen concentration. It is virtually free of suspended solids. Also, more than 90 percent of all bacteria present are removed. The high quality membrane technology used guarantees a consistently high quality of the treated water.

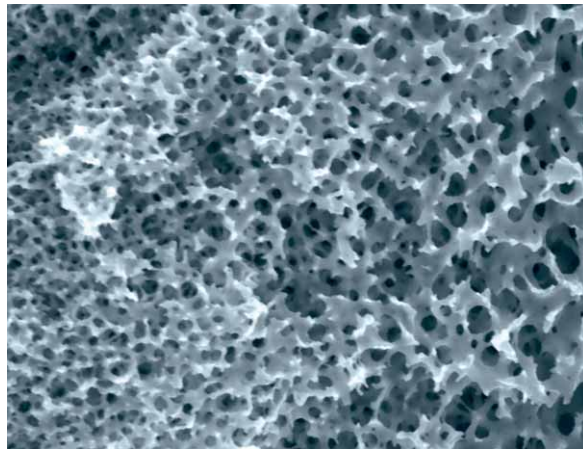
Thanks to its excellent quality, the treated water is suitable for recycling, for example for groundwater recharge or irrigation. It can also, after further treatment, be used in a wide range of industrial applications, such as in the production of boiler feed or process water.

With its compact design, small footprint and uncomplicated installation, BIOFIT®.Watercell units are ideally suited for locations where there is limited space available.

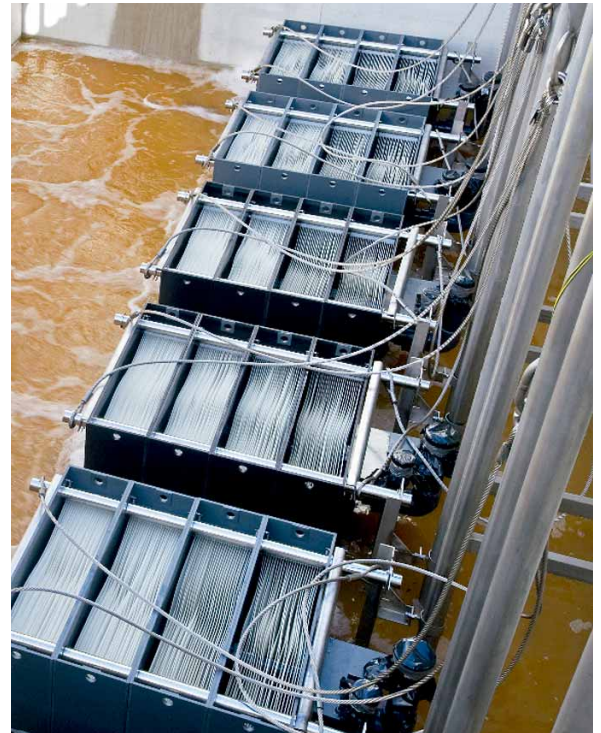
The increased concentration of biomass in the activated sludge basin of the BIOFIT®.Watercell system leads to excellent efficiency of treatment.

Since the BIOFIT®.Watercell technology works without a secondary clarifier, there is no risk of solids transfer to discharge. All solids are separated by membrane filtration. Moreover its performance is independent of the sludge properties.

Due to the modular design, plants' capacity can be increased incrementally. This means BIOFIT®.Watercell systems are also suitable for extending or upgrading existing wastewater treatment plants and can be easily adapted to growing needs.



Micrograph of the flat sheet membrane surface that ensures excellent bacterial retention rates.



Typical flat sheet membrane module used in BIOFIT®.Watercell systems.



Process technology specifically adapted to use in containerized mobile systems



BIOFIT® Watercell Typical Technical Specifications

Process Specifications*	Unit	Watercell 500	Watercell 1000
INLET			
Q, daily flow rate	m ³ /day	100	200
Q, hourly maximum flow rate	m ³ /h	7	14
BOD5 max.	mg/l	300	300
COD max.	mg/l	600	600
Total suspended solids	mg/l	350	350
N total	mg/l	60	60
P total	mg/l	10	10
pH		6.5 – 7.5	6.5 – 7.5
Water temperature	°C	5 - 35	5 - 35
OUTLET*			
BOD5	mg/l	< 5	< 5
COD	mg/l	< 30	< 30
NH3-N	mg/l	< 5	< 5
Total suspended solids	mg/l	< 1	< 1
*Based on standard municipal wastewater			
EQUIPMENT SPECIFICATION			
Required footprint, L x W	m	7.5 x 6.5	7.5 x 12.5
Biological aeration tank volume	m ³	37	74
MBR tank volume	m ³	24	24
Permeate (clear) water tank volume	l	2000	2000
Membrane surface area	m ²	400	800
Permeate and backwash pump, frequency regulated	m ³ /h	9	2 x 9
Recirculation Pump (duty/ standby)	m ³ /h	40	80
Air blower for membrane cross-flow	m ³ /h	280	560
Air blower for aeration	m ³ /h	220	440
POWER RATING (ave. value)			
Drum screen	kW	0.25	0.25
Permeate and backwash pump, frequency regulated	kW	1.0	1.0
Recirculation Pump	kW	0.9	1.5
Air blower for membrane cross-flow	kW	5.3	10.6
Air blower for aeration	kW	5.3	10.6

Options offered for BIOFIT®.WaterCell

Commissioning & Relocation

H+E will supply and deliver the Watercell system itself and also all the services necessary to put the system into operation when first installed or when a relocation is required.



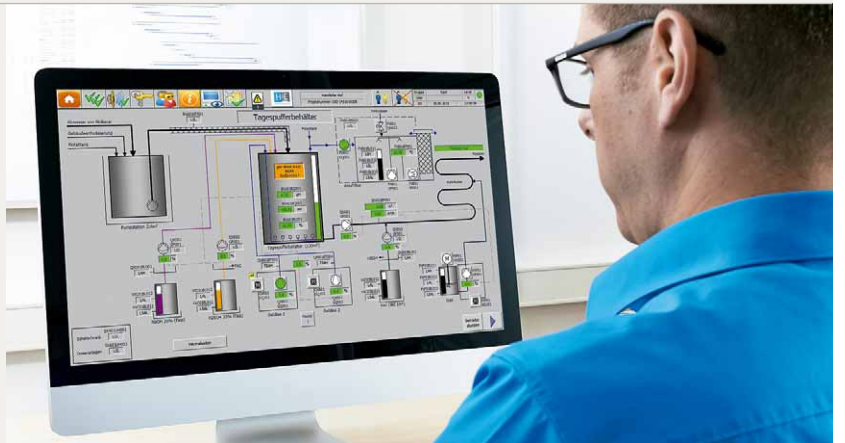
Maintenance & Service

H+E can offer a wide variety of service solutions specifically tailored to your BIOFIT®.Watercell system. Ask one of our sales representatives for a customized solution just for you.



Remote Monitoring

With BIOFIT®.Remote your Watercell system will be under constant monitoring by well trained staff of H+E. This will ensure operational stability at all times.



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