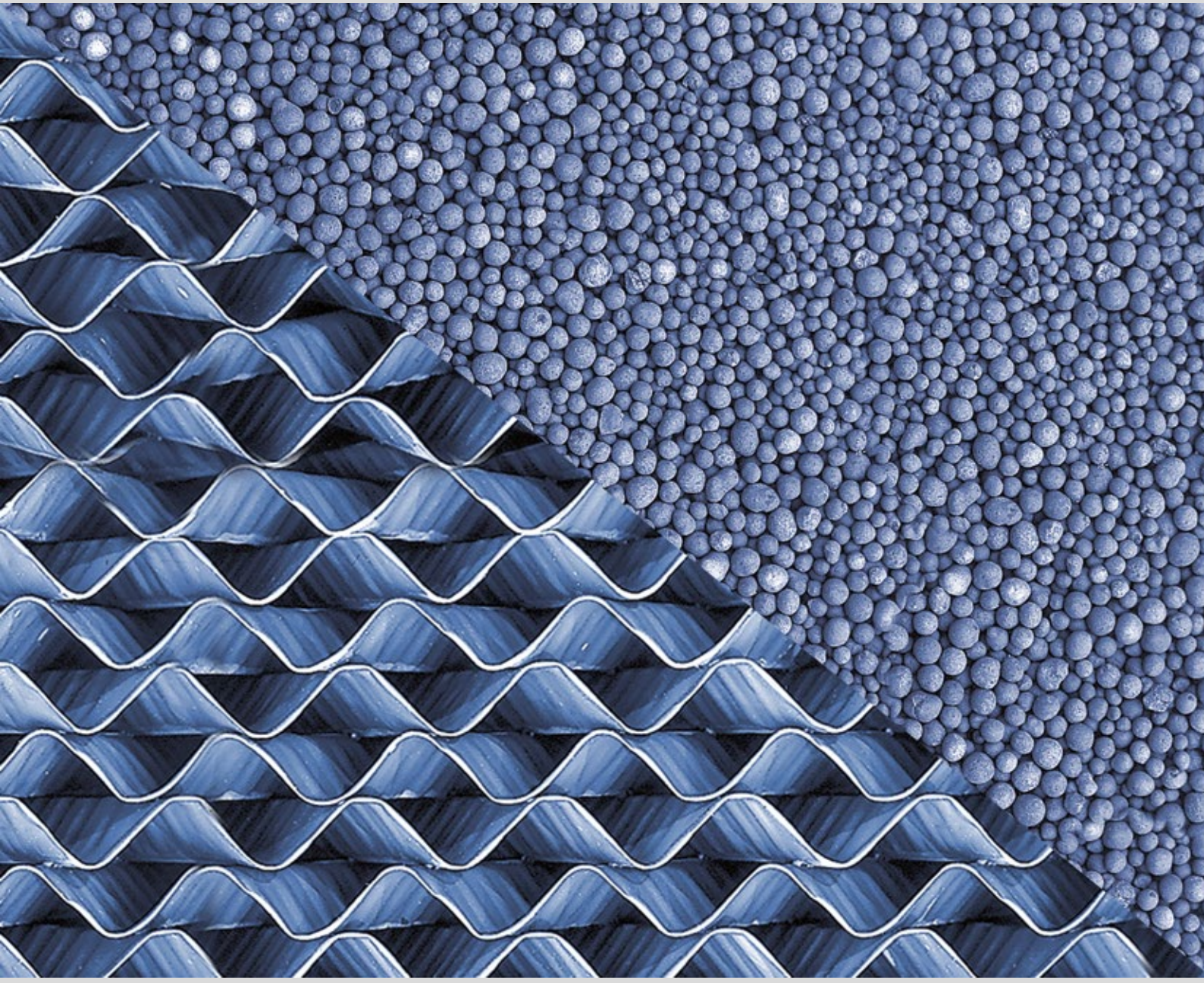
Technology Review

WABAG BIOPUR®



Biofiltration for wastewater treatment

WABAG

WABAG BIOPUR®

Biofiltration
for wastewater treatment

The BIOPUR® biofiltration system was developed by WABAG in the early 1980's on the basis of many years of experience in wastewater treatment and filtration, and has been subject to a process of ongoing optimisation ever since.

Today WABAG's biofiltration process is one of the most advanced and efficient in the wastewater treatment sector. Its range of applications embraces both the municipal and industrial sectors – including the treatment of wastewater for water reuse (e.g. process water or irrigation).

The biofiltration system can easily be combined with further treatment processes. Moreover, the use of different filter media enables the process to be adapted to a wide range of wastewater types and treatment targets.

Whatever the application, the BIOPUR® system provides a basis for cost-effective solutions, that meet even the most stringent treatment demands.

Tailor-made systems
for optimised facilities

The outstanding feature of BIOPUR® is its use of structured packing and granular filter media. The availability of different carrier materials allows the choice of a filter best-suited to the requirements of the case in hand.

Our backwashing approach is founded on many years of experience

Regular backwashing is necessary in order to remove excess sludge and retained suspended matter from the biofilters. It is is essential to optimum filter operation.

This is guaranteed by backwashing programs, which are adapted to the different filter media and represent the result of many years of experience. Both, BIOPUR® and the bioactive filter stand out due to their relatively low sludge water production.

Meilen WWTP, Switzerland
BIOPUR®-DN, BIOPUR®-NK and flocculation filtration
Commissioning 2012, 52'500 p.e.

Algeciras WWTP, Spain
BIOPUR®-DNK, BIOPUR®-NK and filtration
Commissioning 2009, 204'000 p.e.

Benalmádena WWTP, Spain
BIOPUR®-C and disinfection for water reuse (irrigation)
Commissioning 2007, 273'000 p.e.

Worblental WWTP, Switzerland
BIOPUR®-DN and BIOPUR®-NK
Commissioning 2007, 140'000 p.e.

Carrier materials

Different carrier materials
for a high degree of flexibility

BIOPUR® with structured packing media

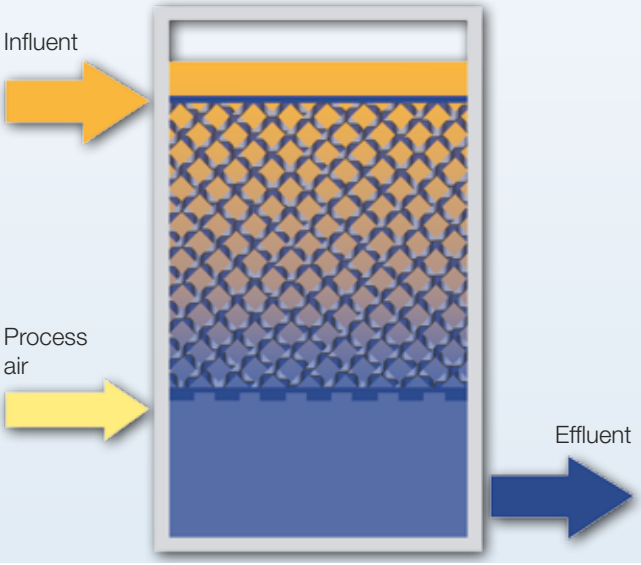
BIOPUR® with structured packing is operated in the downflow mode, i.e. in counter-current to the process air. This mode of operation and the special properties of the structured packing, permit intensive mass transfer with a high oxygen utilisation factor. Due to their high porosity the filters are only subject to negligible pressure loss. Furthermore, they are resistant to clogging. High sludge absorption capacity permits long filter running times and as a result of downflow filtration, only purified wastewater flows through the base of the filter nozzles.

BIOPUR® with granular media

The flow through aerated BIOPUR® with granular filter media is upward, i.e. in a co-current with the process air, while the flow through denitrification BIOPUR® can also be downward. The high specific surfaces of the filter media enable high degradation rates. At the same time, an increased amount of suspended matter is retained. For this reason, BIOPUR® is ideally suited to situations where no filtration stage is necessary.

Bioactive filters

Wastewater filtration is necessary when discharge requirements are particularly stringent with regard to suspended matter and/or phosphorous. However, the filtration can also be used for additional biological processes, especially post-denitrification. This type of bioactive filtration may also be of interest as a supplement to existing filters.



Applications

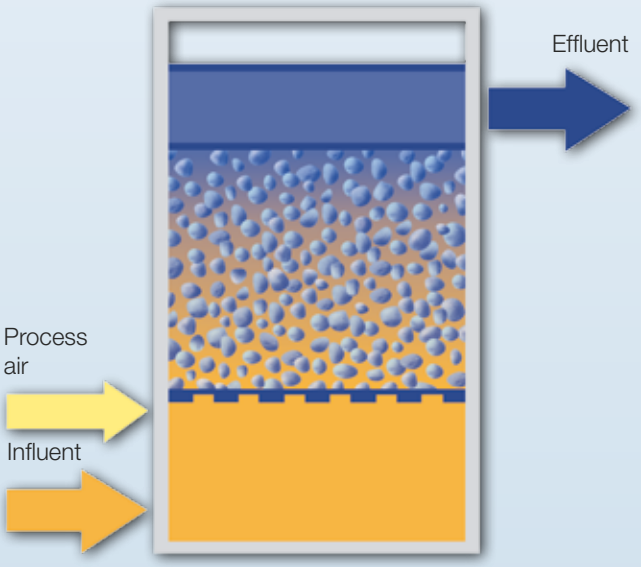
- Elimination of organic pollution (BIOPUR®-C)
- Pre-denitrification (BIOPUR®-DN)
- Nitrification (BIOPUR®-N)

Characteristics

- Height of filter media 3 – 6 m
- Specific surface 250 – 400 m^2/m^3
- Filtration velocity up to 25 m/h
- Filter running time 24 – 72 h

Advantages

- Negligible filter head loss
- Long filter running time
- Absorption of peak loads due to backmixing in the filter
- Simultaneous phosphate precipitation



Applications

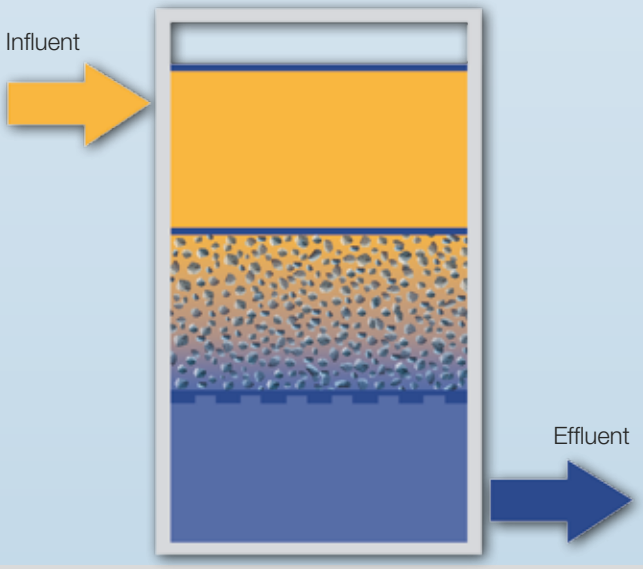
- Elimination of organic pollution (BIOPUR®-CK)
- Pre- and post-denitrification (BIOPUR®-DNK)
- Nitrification (BIOPUR®-NK)

Characteristics

- Height of filter media 3 – 4 m
- Specific surface 600 – 1,200 m^2/m^3
- Filtration velocity up to 20 m/h
- Filter running time 24 – 48 h

Advantages

- Increased solids retention
- Simultaneous phosphate precipitation



Applications

- Flocculation-filtration
- Post-denitrification
- Elimination of residual ammonia and nitrite

Characteristics

- Single- or multi-layer filter
- Height of filter media 1.2 – 2.5 m
- Filtration velocity up to 20 m/h
- Filter running time 24 – 48 h

Advantages

- Deep bed filtration
- Operation security
- Low consumption of backwash water

BIOPUR®
always open to combination

Further treatment processes such as oxidation (BIOZONE®) or activated carbon filtration can be combined with BIOPUR® applications.

At the preclarification stage, the use of OPUR-SK® lamella clarification makes for extremely compact wastewater treatment facilities.

Disinfection of the treated wastewater allows water reuse at a very high quality level and low operation costs.

BIOPUR®
advantages in brief

- Compact design and a small footprint allow attractive architectural integration and easy off-air treatment if necessary
- Versatile applications
- High operational safety
- High treatment efficiency
- Insensitivity to hydraulic peaks
- Suitable for water reuse
- Economic and flexible operation

Baotou WWTP, P.R. China
OPUR-SK® and BIOPUR®-NK for water reuse
(cooling water for power plant)
Commissioning 2005, 40'000 m^3/d

Würenlingen, Switzerland
BIOZONE®: BIOPUR® and Ozonisation
for landfill leachate treatment
Commissioning 2001, 350 m^3/d

WABAG

WABAG offers sustainable solutions for:

- Drinking water treatment
- Industrial and process water treatment
- Water reclamation
- Sea and brackish water desalination
- Municipal wastewater treatment
- Industrial wastewater treatment
- Sludge treatment

WABAG is one of the world's most innovative water treatment companies with know-how in specific technologies and in-house developed processes such as:

Biofiltration	BIOPUR®
Moving bed biology	FLUOPUR®
Activated sludge processes	Hybrid™, SBR, MICROPUR-CAS®
Membrane bioreactor	MARAPUR®, MICROPUR-MBR®
Membrane filtration	RO, MF, UF, NF CERAMOPUR®, CERAMOZONE®
Denitrification	BIODEN®, ENR®
Oxidation processes	ADOX®, BIOZONE®
Adsorption processes	CARBOPUR®, PACOPUR®
Thermal desalination	MED, TVC, MVC, MSF MED XXL™
Fine sieving	MICROPUR®

- Deep bed filtration in various designs
- Anaerobic sludge digestion including advanced energy recovery

The WABAG Group represents a leading multinational player with companies and offices in 20 countries and a focus on emerging markets in Europe, Africa, Middle East, South East Asia, China and India.

sustainable solutions. for a better life.

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