

BIOPAQ® AFR

Anaerobic industrial effluent treatment

Anaerobic Flotation Reactor technology is especially developed for conversion of solids, especially fats or proteins, into biogas.





Converts fats and proteins into energy-rich biogas

The BIOPAQ® Anaerobic Flotation Reactor - AFR is specifically designed for the treatment of wastewater containing high concentrations of fats, oil and grease (FOG) and other biodegradable compounds such as proteins and starches. The BIOPAQ®AFR will reliably and efficiently convert these organic compounds, typically present in the range from 5-70 g/l of COD (with a max of 14 g/l of FOG) in e.g. the meat and dairy and food manufacturing industry.

The COD is converted into valuable biogas, while producing a high quality treated effluent. Biomass retention using the biogas flotation unit prevents biomass loss and permits the decoupling of hydraulic retention time (HRT) from solids retention time (SRT). This allows HRT's from 1-8 days with a SRT >50 days. At loading rates from 2-8 kg COD/m³/day and a high concentration of well mixed flocculent biomass, the BIOPAQ®AFR combines the high efficiency and compact footprint of a high-rate reactor with the stability and biogas production of an anaerobic CSTR.

BIOPAQ®AFR is one of the members of the BIOPAQ family of anaerobic reactors developed by Paques, in cooperation with universities, research institutes and customers. Fundamental and applied research into biological, physical and mechanical aspects of the system, together with over 40 years of experience and over 1,500 successful anaerobic installations, enables Paques to provide every customer with a tailor made wastewater treatment system that exceeds the client's expectations.

About BIOPAQ®AFR

- Proven technology, > 10 years operational experience
- Maximum biogas production from COD, FOG and proteins
- High flocculent biomass concentration
- Efficient biomass retention
- Low HRT, High SRT
- Loading rates 2-8 kg COD/m³/d
- Compact footprint
- No pre-treatment required
- Low sludge production
- Good effluent quality
- Tailor made solutions
- Worldwide availability
- A complete range of standardised concepts
- Low maintenance, no rotating equipment inside tanks

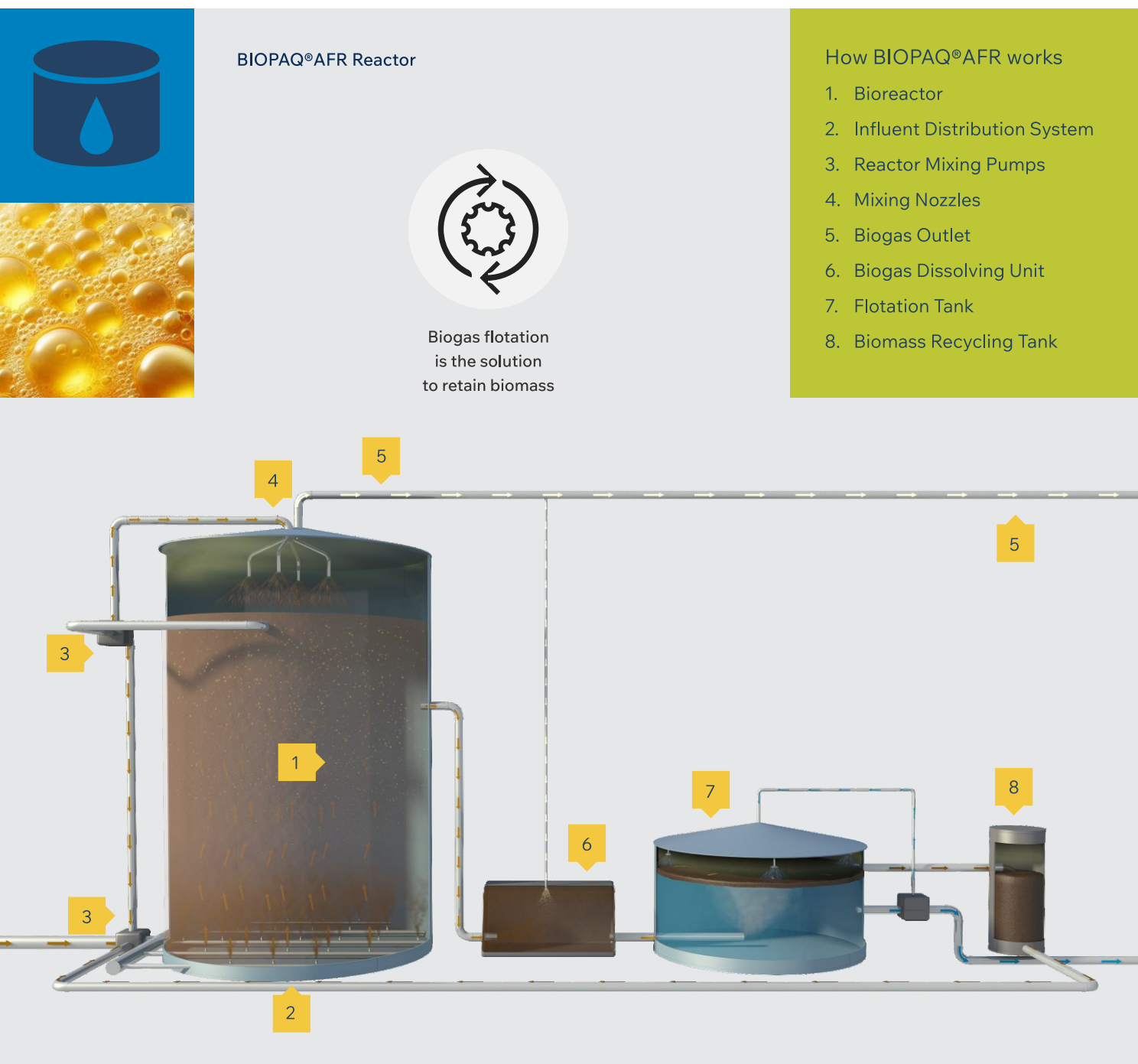
Characteristics of BIOPAQ®AFR

Industrial wastewater is pumped to the Bioreactor (1) through the Influent Distribution System (2) where it is thoroughly mixed with the reactor's anaerobic biomass to achieve optimal contact between biomass and organic compounds to be degraded.

The Bioreactor is hydraulically mixed by continuously pumping (3) the reactor contents to the influent distribution system and to the nozzles (4) in the upper part of the reactor. This exceptionally efficient mixing system ensures maximum conversion of the organic compounds, including fats and proteins, into valuable methane or biogas.

The biogas is collected in the head-space where it leaves the reactor (5) to be used as green energy in boilers, gas engines or upgraded to pipeline quality Renewable Natural Gas (RNG).

Following anaerobic digestion in the Bioreactor, the biomass solids are separated from the treated water through the Dissolved Biogas Flotation (DBF) process. In the DBF process, the effluent is continuously pumped into a Biogas Dissolving Unit (6), operating at 3-5 bar, in which biogas is pumped and dissolved in the solution. This pressurized stream is then released in center of the Flotation Tank (7) at the bottom. Returning the stream to nearly atmospheric pressure causes the biogas to come out of solution and form small bubbles that attach to the biomass flocs. As the flow travels towards the tank's periphery, the flocs float to the surface where they compress into a flotation layer that is collected in a trough and flows towards the Biomass Recycling Tank (8). From this tank the biomass is pumped back to the Bioreactor. The treated water below the flotation layer leaves the flotation tank by means of a pump or valve and can be discharged or post treated.



Together, we're leading the biotech revolution in wastewater and biogas

We are a leading force in biotech wastewater and biogas, driven by a community of scientists, problem solvers, application specialists and exceptional people who all believe in one thing: That protecting the world's water and resources is vital if we are to preserve our planet for generations to come.

Since we founded our company, we've pioneered and developed biotech solutions proven to help our customers' effectively and sustainably treat wastewater and generate biofuel to power their operations.

It's safe to say we've grown from our humble beginnings in Balk—to an international powerhouse with more than 3,300 installs in over 60 countries. Our expertise and technologies are trusted by many the world's most trusted companies.

Whether in brewing, pulp & paper, chemicals or food—we create partnerships that help businesses maximise their resources while reducing their impact.

Our unique blend of expertise, trusted technologies, and global network enables us to guide and empower our customers with solutions proven to help them meet their sustainability goals. By continuing to reinvent, refine, and renovate our technologies we can help protect the planet, communities and best serve our customers.

The world's resources are finite—but our potential is limitless. By working together—we can create a cleaner, more circular future that works for everyone.

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