



RAITA BioKem XL has been developed for communities, villages, agriculture, hotels, etc. for wastewater treatment.

BioKem XL sewage treatment plant is available in sizes 5-500 m³ / 24 hours. It is cost-effective, self-regulating, remotely controlled and tailored to each individual facility.



Raita Environment is a specialist in environmental technology

Our passion is to develop and manufacture environmentally friendly and sustainable products for waste management. With our systems, we want to leave as little environmental impact (footprint) as possible on our earth.

In addition to the environmental benefits, our systems are reliable and affordable. Waste and wastewater are cleaned and used locally, and in this way acquisition and operating costs are affordable.

Our activities in water and sewage technology began already in the 1950s in Finland. Over the decades, our operations and expertise in areas have been refined to be the leading sewage and environmental technology development experts that we are today.

Raita Environment is known as a reliable and respected partner and operator. Our systems and products are used in hundreds of thousands of different locations in Finland and abroad.

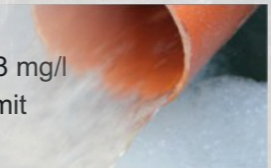
Our areas of expertise include biotoilets, gray and rainwater treatment, wastewater treatment and composting.

Contact us for more information.



RAITA BioKem XL - 120 m³/24 h

- installed 2006 - permit requirements BOD 15 mg/l - P_{tot} 0,8 mg/l
- approx. 800 samples in 2007 - 2021 - 99% better than permit requirements
- average treatment efficiency in 2021:
BOD 98% (5.3 mg/l - from 3.0 to 11.0 mg/l)
P_{tot} 95% (0.56 mg/l - from 0.09 to 0.7 mg/l)



Effective purification process:

Aeration of organic matter, nitrification and denitrification, are important parts of the process:

Bioprocess:

Waste water from properties is led to the treatment plant. The first tank space is the wastewater pretreatment space.

The treatment plant monitors incoming wastewater volumes and automatically adjusts its functions when the load changes. When enough water has been collected in the pretreatment tank, aeration of the organic material in the wastewater and nitrogen nitrification (fine bubble aeration) begin.

During aeration, the activated sludge in the process tank is mixed with the pre-treated wastewater. After that, the bioprocess and microbial growth begins in the activated sludge, which uses organic material as food.

At the same time, nitrification takes place, which means that the nitrogen oxidizes (oxygenates). The air that is pumped into the water leaves the treatment plant through the drain ventilation.

Alongside bioprocesses, a chemical process continues:

While aeration is taking place, RAKE (iron chemical) is dosed into the treatment plant to separate phosphorus from the wastewater. At the end of the aeration, a clarification period begins, this means that the activated sludge and phosphorus (which has reacted with RAKE) fall to the bottom of the process tank. At the same time, the last of the bioprocesses (with the nitrogen), denitrification, takes place.

Pumping purified water:

When the clarification period is over, the purified water is pumped out of the treatment plant. Purified water is pumped through the pipes where part of it is automatically separated into a monitoring vessel. There it is then easy to check the effectiveness of the purification process in the sample.

Automatic functions in case of downtime:

The treatment plant is equipped with automatic functions to maintain the biological process if there is no incoming wastewater (operation stoppage). The treatment plant then automatically supplies air and existing wastewater to the process tank if the shutdown is prolonged.

Purified water goes back to nature:

Purified water can be led directly to an open ditch or absorbed/filtered through simple post-filtration in the terrain.

The degree of purification in that water is also sufficient for sensitive areas (beaches and groundwater areas). Further treatment, the so-called "third stage" (for particularly sensitive coastal areas, groundwater areas) can be connected to the treatment plant. It ensures even higher purification of the outgoing water.

Sludge treatment:

The sludge from the RAITA BioKem treatment plant is odorless and stabilized in the bioprocesses. It is generated in small amounts, 0.3 to 0.1% of the amount of treated wastewater (1-3 l/m³). A sludge treatment equipment is connected to the treatment plant to remove excess sludge from the process tank.

The sludge is collected in a separate sludge tank, where it is then emptied by a sludge truck for further transport to municipal treatment. The tank size is dimensioned for the appropriate emptying interval. The sludge can also be dried and composted at the treatment plant, in which case emptying with the tanker is not required.



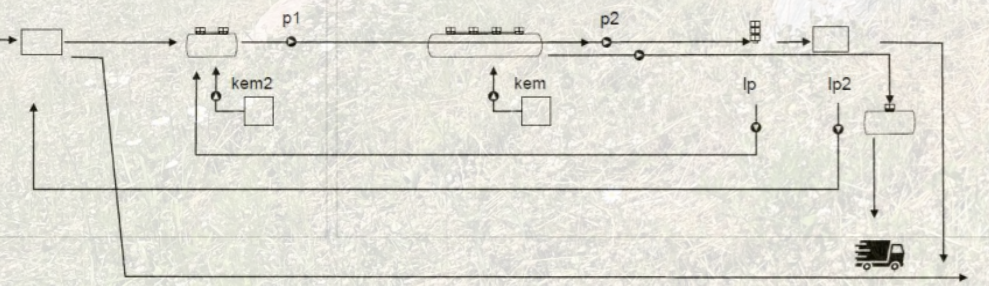
RAITA BioKem XL - 50 m³/ 24 h

- installed 2013 - permit requirements BOD 25 mg/l - Ptot 2 mg/l
- approx. 400 samples in 2013 - 2021 - 100% better than permit requirements
- average purification efficiency 2013-2021: BOD 96%, Ptot 95%



RAITA BioKem XL - 30 m³/ 24 h

- installed 2021 - permit requirements BOD 15 mg/l - Ptot 1 mg/l
- approx. 150 samples in 2021 - 100% better than permit requirements
- average treatment efficiency in 2021:
 BOD 99% (4.2 mg/l - from 1.6 to 8.1 mg/l)
 Ptot 95% (0.63 mg/l - from 0.18 to 0.75 mg/l)
 Ntot 77% (22.6 mg/l - from 2.7 to 30 mg/l)

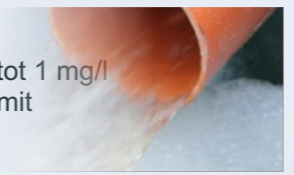


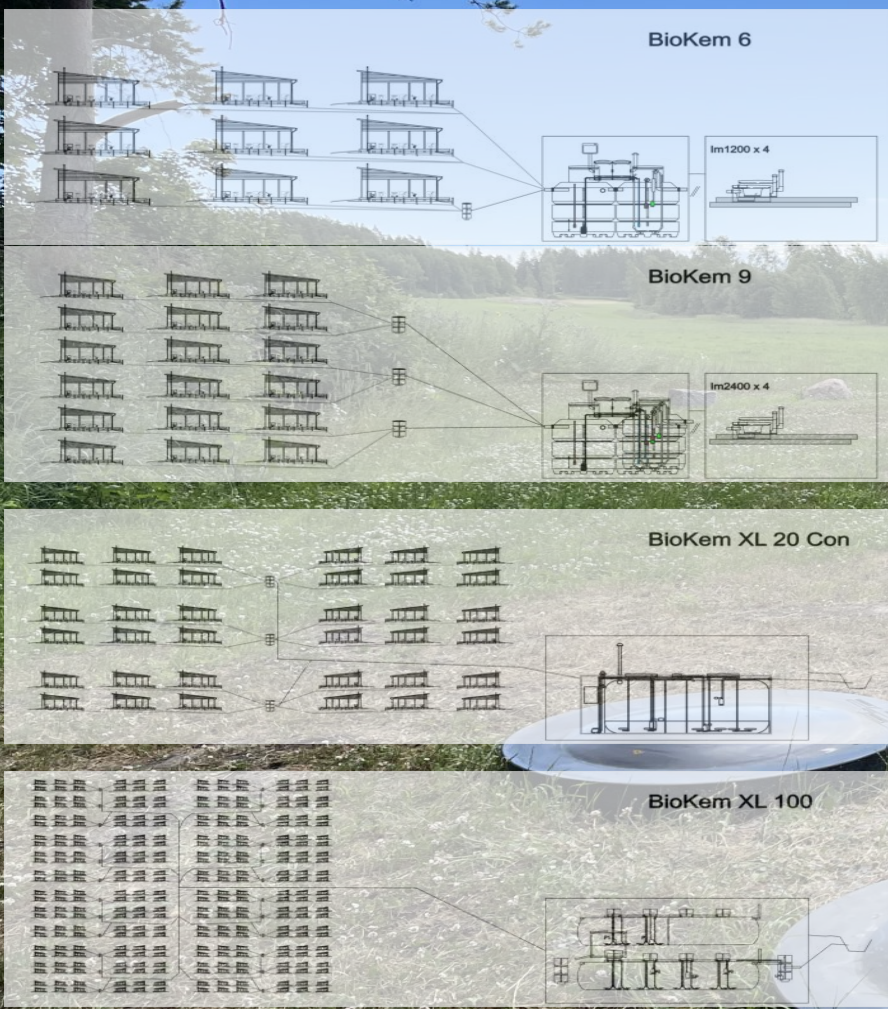
Steps in the biochemical purification process.



RAITA BioKem XL - 50 m³/ 24 h

- installed in 2004 - permit requirements BOD 15 mg/l - Ptot 1 mg/l
- approx. 900 samples 2004 - 2021 - 99% better than permit requirements
- average treatment efficiency 2004-2021:
 BOD 95%, Ptot 95%





The purification efficiency of RAITA BioChem

- corresponds to EU regulations
- corresponds to national regulations



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