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PRODUCTION PRIVATE UNITARY ENTERPRISE

Presentation of Wastewater Treatment Technologies by Belarusian company Belekpol, Minsk

For more than 33 years "Belekpol" has been successfully involved in consulting, survey, design, construction, reconstruction and commissioning of pumping stations and treatment facilities for urban and industrial waste water. "Belekpol" also provides production and installation of modern technological equipment.

Belekpol has an experience in design and construction of wastewater treatment facilities for the plants with radioactive flow, for leather processing plants, meat processing plants, milk processing plants, etc.

The Company has successfully implemented the design and construction of more than 280 objects. The capacity of existing systems varies up to 1,200,000 m^3/day.

"Belekpol" has won international tenders in Belarus, Poland, Macedonia, China, Yugoslavia, Kazakhstan and Russia. The Company has been awarded with various certificates and diplomas. Belekpol has established business relationships with Western European countries, Egypt, UAE, Saudi Arabia.

Based on its own invention and experience **the Company has developed not only traditional conventional projects of wastewater treatment facilities, but has also introduced dozens of new technologies and solutions of new generation, based on the use of bioblocks. Bioblocks are modular wastewater treatment units of different capacity providing all the processes for wastewater treatment including advanced treatment with concentration of BOD up to 3-5 mg/l in one facility.**

It means that the advantage of bioblock is that its design depends on the required degree of water purification. All the necessary multifunctional technological processes - dephosphotation, denitrification, nitrification, secondary settling, tertiary deep treatment, recirculation and removal of excess sludge, collecting and removal of floating substances, disinfection are implemented in one single facility.

Reliability and durability of these structures is provided by the original technology, compact design, new exclusive energy-saving methods of biological processes and required automated and semi-automated technological equipment.

The absence of separate standing facilities, energy-intensive mechanical equipment, pumps, sludge dredgers and scrapers makes wastewater treatment plants more reliable. It also provides decrease of staff required to maintain the equipment and decrease of energy costs making the whole process of water treatment more efficient.

Depending on the required capacity and the required quality of effluent concentration of contamination, a special design of bioblock is developed. All the data is analyzed, and depending on calculations and properties of Belekpol technology, a special design of hydraulic regimes, biological processes, constructive solutions of process zones, the required degree of activated sludge recycling and aeration intensity are chosen.

After the required mass transfer between the aerated volume and sludge separator has been chosen, the desired degree of mixed liquor recycling in the bioblock, which provides the control of BOD and nitrogen and phosphorus compounds in the cleaning process might be controlled.

A characteristic feature of the bioblock is that **the process of oxidation of contaminants occurs both in the aeration zone and in the suspended layer of the activated sludge of the sludge separator (secondary settler).**

Bioblock is **equipped with pneumatic fine-bubble aeration system (developed and produced by Belekpol)**, which in combination with the design of the facilities **provides the necessary oxygen regime and high mass transfer of mixed liquor.**

The number of aerosol emissions using bioblocks is sharply reduced as compared with traditional water treatment solutions.

There are almost no aerobic processes, therefore the proposed technology provides protection against smells, which can reduce the area of the sanitary protection zone. The combination of all technological processes in one modular construction significantly reduces the area of wastewater treatment facilities and the length of the necessary technological communications, which has been confirmed by successfully functioning facilities locally and abroad. Therefore, such facilities can be placed in almost any part of the populated areas (the size of the sanitary zone is approx.20-180 m.), i.e there is an opportunity to decentralize wastewater

treatment systems in the cities. It makes the development of cities cheaper and less energy-intensive.

The applied modular design of treatment facilities ensures the implementation of new construction and update of the existing facilities bringing their quantitative and qualitative indicators to the required level with a significant economic effect. The construction might be implemented stage-by-stage, increasing the required capacity depending on investments provided.

The use of bioblocks provides decrease of:

- **construction volume up to 60%**
- **earthworks up to 70%**
- **extent of technological communication by 2÷6 times**
- **energy consumption of facilities up to 40%**
- **footprint up to 50÷60%**
- **sanitary zone area by 3÷10 times**
- **number of staff by 2÷3 times.**

During operation all the abovementioned benefits were confirmed. The facilities have been functioning for many years in residential districts of a number of cities in Western Europe, Russia and Belarus without any complaints received from the public and health services.

The design of bioblock provides if necessary advanced treatment (BOD of up to 3-5 mg/l) using attached microorganisms technology.

Belekpol technology of wastewater deep treatment using a special material (artificial algae, developed and produced by Belekpol) provides a huge increase of active sludge concentration as compared to the amount of sludge in traditional aeration tanks, while the biological process of deep treatment takes only 1,5÷3 hours.

The technology of advanced treatment with the use of artificial algae has been successfully implemented on many projects in Belarus, Russia and Poland.

Innovations proposed by Belekpol provide a lot of economic and environmental advantages. They are highly efficient in terms of capital costs, operating costs, production costs, environmental safety, which makes them attractive for both public budget funds and private investments, and also makes them more competitive in local and international markets.

Director and Founder of Belekpol  Ivan Rakevitch

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