



## **Integrated Wastewater Treatment System by Eco Life System Sp. z o.o.**

Setting a parameters of output water very high creates a requirement to look for savings within the wastewater treatment system to meet future costs.

**Integrated Wastewater Treatment System ( IWTS) based on the Eco Tabs Technology** was created to meet these challenges.

Thanks to IWTS, we can control and optimize the costs of maintaining a sewerage network and a sewage treatment plant.

Eco Tabs technology is a mini sewage treatment plant from the moment of nutrients creation to the discharge of sewage purified to the receiver (lake, river, pond, trench) while the results achieved depend only on the expenditure incurred on the products used.

This action does not require additional investments for infrastructure, and although it is innovative, it has already been tested on many facilities and is the subject of many scientific works.

The basis for scientific studies were pilot projects carried out in sewage treatment plants and in water reservoirs.

Eco Tabs technology will optimize the company's operating costs in terms of odor and sediment management and will allow savings in electricity consumption.

The essence (Eco Tabs) is the introduction into the wastewater and sediments of the freeze-dried inoculum of a natural set of non-pathogenic microorganisms selected for high biochemical activity and adapted to the degradation of organic matter and pollutants.

Together with the inoculated microorganisms, molecular oxygen is introduced in the form of nano-micro gas bubbles, whose function is to oxygenate the environment and transport the inoculated microorganisms.

The task of the inoculum of microorganisms introduced into the environment is the rapid initiation of oxidative degradation and mineralization of organic pollutants.

The organic compounds dissolving in water and the contaminant contaminating the aquatic environment will be enzymatically degraded to monomeric substances and assimilated by micro heterotrophs embedded in their biomass and 80-90% mineralized in the process of respiration to carbon dioxide and mineral salts.

Mineral nitrogen and phosphorus products generated in aerobic respiration will be partially assimilated and used to produce biomass of microorganisms, and the remaining part of inorganic orthophosphates (hardly soluble in water in oxygen redox potential) will be precipitated from the water and biologically immobilized

in highly mineralized oxygenated sediments.

The reduced forms of nitrogen are oxidized and further transformed into molecular nitrogen in the anammox process. The bacterial biomass produced in these processes will be consumed by bacterial protozoa.

The effect of microbiological bioremediation will be: removal of excess organic and mineral compounds from wastewater.

The Eco Tabs technology belongs to the group of so-called "Green technologies" that are environment-friendly and do not disturb the ecological functioning of water ecosystems.

## Optimization of the costs of maintenance of the sewage network and elimination of odors.

ECO-TABS TM in the form of tablets and powder contain specialized strains of non-pathogenic aerobic bacteria dispensed directly to the pumping station.

Dosing - 1 Eco Tabs tablet + 1 Eco Shock sachet for 1000 m<sup>3</sup> of sewage flowing, dispense at intervals of 7 days.

Below is a comparison of Eco Tabs to Ferrox.

## TECHNOLOGY Eco-Tabs - IT'S A MINI-PURIFICATION OF WASTEWATER IN THE SEWAGE NETWORK

### Eco-Tabs products

O<sub>2</sub> molecular oxygen donor,

Microdot (TSM) separation technology,

They oxygenate wastewater, supporting the mineralization processes of organic matter.

Cost 0,1-0,2 USD/ m<sup>3</sup> sewage



Ferrox destroys the sewage made of concrete, causes corrosion of pipes, contributes to the increase of sludge in the sewage treatment plant, At a concentration of 200-300 ppm, the agent should be used in an amount of approx. 200 - 350g / m<sup>3</sup> of sewage  
The cost of the product is approx. PLN 850 per ton,  
The unit cost for 1 m<sup>3</sup> of sewage is 0,1-0,2USD  
The cost of the dosing installation is about 6000 USD

(źródło: K. Krzaczkowski, Prezentacja 09. 2012)

Eco Tabs contain O<sub>2</sub> molecular oxygen donor released into wastewater in Microdot Separation Technology (TSM), thanks to which they perfectly oxygenate wastewater and surface of the slurry, supporting the mineralization processes of organic matter.

Operation on the sewerage network translates directly into the amount of pollutant load flowing in the form of raw sewage to the sewage treatment plant.

It allows to optimize the costs of sludge management.

Exemplary results of treatment at sewage treatment plant - 3000 m<sup>3</sup> sewage per day. Eco Tabs were dispensing to the **primary clarifier**  
 Before and after the use of Eco Tabs technology ( chart below )

	<b>Before</b>	<b>Eco Tabs</b>	<b>% reduction</b>
<b>Nitrogen (mg/dm)</b>	71,57	48,5	<b>32%</b>
<b>Ammonium (mg/dm<sup>3</sup>)</b>	64,93	40,1	<b>38%</b>
<b>Phosphorus (mg/dm<sup>3</sup>)</b>	16,19	7,95	<b>51%</b>
<b>COD (mgO<sub>2</sub>/dm<sup>3</sup>)</b>	670,71	534,25	<b>20%</b>

The results of tests carried out during the project i Waste Water Treatment Plant in Wrzesnia

This type of operation leads in a straight line to increasing the percentage of reduction of pollutant load, which translates into optimization of the company's financial result.

Example below.

IX - XII ROK	COD			BOD			Nitrogen			Phosphorus		
	Crude Sewage mg/l	Treated Sewage mg/l	Efficiency %	Crude Sewage mg/l	Treated Sewage mg/l	Efficiency %	Crude Sewage mg/l	Treated Sewage mg/l	Efficiency %	Crude Sewage mg/l	Treated Sewage mg/l	Efficiency %
2012	1304	45,8	<b>96,5</b>	458	3	<b>99,3</b>	82,5	10,9	<b>86,8</b>	22,6	1,5	<b>93,4</b>
2013	1076	41,2	<b>96,2</b>	530	2,5	<b>99,5</b>	64,2	10,1	<b>84,3</b>	13,3	0,79	<b>94,1</b>
2014 Eco-Tabs	1369	44,5	<b>96,7</b>	715	2,2	<b>99,7</b>	109,0	10,6	<b>90,3</b>	35,0	1,4	<b>96,0</b>

Effectiveness of the sewage treatment plant. Q d = 6000 m<sup>3</sup> / d.

2014 - Eco Tabs products were used.

It should be added that during the project no **PIX** was used.

The reduced pollution load affects the reduction of the amount of deposits and the degree of their mineralization.

The results of dispensing to the main pumping station in the city cleaning system (3,000 m<sup>3</sup> / d) in the amount of **20 tablets and 20 sachets per week** caused that the amount of sludge fell significantly during the third month of the project (**dry mass s. m.**)

September 2016 - volume of sewage - **75 668 m<sup>3</sup>**, amount of sediments - s. m. **68.998 Mg**

September 2017- (**3 months dispensing Eco Tabs products**) main pumping station. ( 3000 m<sup>3</sup> a day )

The amount of sewage - **113 094 m<sup>3</sup>**, the amount of sludge - s. m. 68,91 Mg

Eco Tabs technology allows to eliminate excess sludge in the process of **aerobic stabilization**

**1 Eco Tabs + 1 sachet (250 g) Eco Shock removes 5 m<sup>3</sup> of 2% sediment.**

The load of nitrogen, COD and phosphorus in the overflowing seawater will be significantly reduced.

**Budget for first 3 months -1 Eco Tabs + 1 sachet (250 g) per 500 m<sup>3</sup> of sewage, subsequent months 1 Eco Tabs and 1 sachet per 500 -1000 m<sup>3</sup> of sewage.**

Regards,

Waldemar Wojciechowicz,

Eco Life System Sp. z o.o., 11-700 Mrągowo, ul. Wolności 20A/2

[wk@ecolifsystem.com.pl](mailto:wk@ecolifsystem.com.pl), [www.ecolifsystem.com.pl](http://www.ecolifsystem.com.pl), cell. 48-514 752 468