

Bioclean Pond Clarifier

Nature's power packaged for complete lake bioremediation
Restoration of ecological balance in freshwater lakes



MalaTECH
water

BIOREMEDIATION OF FRESHWATER LAKES – BIOCLEAR POND CLARIFIER THE COMPLEX SOLUTION FOR RESTORING ECOLOGICAL BALANCE

Bioremediation of freshwater bodies means the improvement of the conditions in highly eutrophic waters (in a bad ecological state) by the introduction of all natural, useful microorganisms and enzymes isolated from soil or water. These microorganisms are capable of leading the total aquatic ecosystem back to the ecological balance needed for a healthy aquatic life.

The essence of bioremediation with Bioclean Pond Clarifier is the enrichment of water with bacterial species that take a significant part in the freshwater's natural self-purification processes, by highly accelerating them without any harmful side effects.

Technically, if we want to summarize a lake bioremediation with Bioclean Pond Clarifier, we can announce that we do not do other than we give back those microorganisms to the lake, which should be there, but due to eutrophication, other species have outgrown them, and resulted the collapse of ecological balance. We maximize the self-purification ability of the lake by putting those organisms back in the water body which will make a turnaround for the deterioration processes of broken ecological balance, and eutrophication, we guide the lake back to its healthy ecological state. Bioclean Pond Clarifier is a real proof that deterioration of ecological state (eutrophication - succession) is not a one-way street, there is a way back.

After entering the water these non-pathogenic, and non-GMO bacterial cultures can effectively break down the organic materials in the water column, reduce the concentration of inorganic nutrients by removing (N) and immobilizing (P) them, restore the DO balance of the freshwater body, and break down the organic content of the sediment layer in oxidative conditions, forming harmless carbon dioxide and water as end products of organic removal. By successfully re-establishing the lake's ability for self-purification, algae/aquatic weed control, water



quality improvement, the height of the sediment layer starts to decrease while the sediment is stabilized by the massive reduction of its organic content. Significantly reduced anaerobic activity in the sediment layer results the fall of anaerobic gas production as well (H_2S , NH_3). The yearly sediment production will also drop significantly, the Dissolved Oxygen balance in the water column will be restored, the risk of potential fish kills will be reduced to minimum. As a result of the treatment, the water body reaches an ecological state, as it would be without the adverse effects of human civilization.

There are literally millions of different naturally occurring microbes in our world. We have found a way to isolate and create unique products from certain microbes to perform highly specific, beneficial tasks. The microbes in Bioclean Pond Clarifier help to restore natural balance in situations where environmental factors have led to unstable and unhealthy water quality conditions. We have encapsulated the microbes, and inactivated them in a powder form to provide a multiple year shelf life for Bioclean Pond Clarifier. Moreover, we attached a part of the microbe content on extremely low size carriers. Whenever Bioclean Pond Clarifier is mixed with water, a part of the microbes will be in aqueous solution, and start bioremediation processes in the water column, while those microbes which are attached to the carriers will sink to the bottom of the lake, and start their action in the benthic area.



BIOCLEAN POND CLARIFIER – ALGAE, AQUATIC WEED CONTROL, NUTRIENT REMOVAL (NH_4^+ , NO_2^- , NO_3^- , PO_4^{3-})

With Bioclean Pond Clarifier Nitrogen removal is processed through multiple steps of reactions, which is practically a combined nitrification-denitrification procedure. The bigger portion of Ammonium ions are oxidized by our bacteria to Nitrate in 2 steps, then Nitrate is reduced to Nitrogen gas inside the cells, and released into the atmosphere. The rest of Ammonium and Nitrate ions are consumed by the bacteria as nutrient supply to create cell mass.



When quick Ammonium, and free Ammonia reduction is needed in short term, please check [Bioclean Aqua](#), which is our supplementary product for Bioclean Pond Clarifier bioremediation.

On application of Bioclean Pond Clarifier, bio-polymers secreted by certain strains of microbes coagulate the suspended particulate matter and soluble phosphates from the water. The organic matter is degraded by action of enzymes secreted by the microbes. Bioclean Pond Clarifier contains a very high concentration of specially selected bacteria, which ensures a proper biodegradation process. Bio-polymers secreted by Bioclean Pond Clarifier bacteria are also for immobilizing ortho-Phosphate ions, and make them inaccessible for vegetation.

The process of Phosphorus removal in lakes by Bioclean Pond Clarifier is as follows:

1. Degradation of Organic Phosphorus

Organic Phosphorus -----> $\text{CO}_2 + \text{H}_2\text{O} + \text{PO}_4^{3-}$

2. Immobilization of Phosphorus

Soluble Phosphate -----> Insoluble Phosphate

Since algae, and aquatic weed species are autotrophic organisms, which require inorganic Carbon as Carbon source, and macronutrients (mainly Ammonium, Nitrate, and ortho-Phosphate), Bioclean Pond Clarifier bioremediation starves out the algae, and aquatic weed, since our bacteria act as microbial competitors for food source for algae, and aquatic weed species. That is how Bioclean Pond Clarifier is able to control algae count, knock down, and prevent the blooming of algae, and aquatic weed without any risks, unlike chemical treatment.

BIOCLEAR POND CLARIFIER – RESTORING THE DISSOLVED OXYGEN BALANCE OF THE LAKE

The deterioration of the Dissolved Oxygen (DO) balance in a water body is usually the first symptom of eutrophication, and disturbed ecological balance. The high load of nutrients results algae or aquatic weed blooms. Overgrowth of algae and vegetation results sunlight reaching only the top layer, and photosynthesis does not happen at the rate it should in the lower parts of the water column. Algae become Oxygen consumers at night, or when sunlight is not present, so they lower the DO concentration. Aquatic weeds are shading the water, which depresses photosynthetic activity. Abundance of organic substances in the water body results that microbial populations consume DO for degrading organic materials.



As Bioclean Pond Clarifier microbes are competitors for food for algae, and aquatic weed, depressing their activity at night, they ensure more DO residual for the dawn, while at daytime photosynthesis is still able to saturate the water with DO. Transparency improves, sunlight reaches deeper layers of the water body, increasing the height of the DO saturated zone. In the meantime, organic pollution is consumed, meaning the phenomenon of extra DO consumption due to organic breakdown will disappear.

The restoration of DO balance is usually the first symptom of Bioclean Pond Clarifier bioremediation, it happens in a few weeks after the first treatment. The risk of fish kills caused by the lack of DO diminishes significantly due to Bioclean Pond Clarifier treatments.

BIOCLEAR POND CLARIFIER – REDUCTION OF SEDIMENT LAYER AT THE BOTTOM OF THE LAKE

Like those bacteria in Bioclean Pond Clarifier which goes to aqueous solution, and break down dissolved, and particulate organic pollution to Carbon Dioxide and water in the water column, the bacteria which remain attached to the silicate-based carriers sink to the bottom of the lake, and starts their activity there. The aerobic and facultative

bacteria in Bioclean Pond Clarifier begins degrading and breaking up the organic content of the sludge at the bottom of the lake in a process known as bio-dredging. Bioclean Pond Clarifier has been formulated with scientifically selected microbes that can break down and utilize materials that are undesirable in the lakebed. The bacteria use up the accumulated undesirable waste as a ready food source.

As the organic content of the sediment layer is being consumed, and starts to decrease, the structure of the sediment changes: the decrease in organic content result the sediment collapse, so the layer height of the sediment decreases significantly. The anaerobic activity drops due to less organic content, and oxidative environment provided at the top of the sediment layer. The color of the sediment changes from black to dark grey first, then to lighter grey, brownish-grey, then brown, as anaerobic activity lowers inside, and organic content decreases, and gets stabilized. The production of anaerobic reductive gases like H₂S, free Ammonia, and Mercaptans decreases, then stops, odor problems disappear. Finally, the sediment becomes a home again for higher life forms, and a healthy benthic area, which is a very important part of the aquatic ecosystem.



The risk of fish kills caused by H₂S, and free Ammonia diminishes significantly due to Bioclean Pond Clarifier.

BIOCLEAN POND CLARIFIER – REDUCTION PATHOGENIC COUNT IN THE LAKE

As beneficial bacteria in Bioclean Pond Clarifier are natural competitors for food for many organisms boosted by eutrophication, we also placed bacteria in the product which act as competitors for food for pathogenic organisms. Bioclean Pond Clarifier treatment usually results a rapid drop of pathogenic bacteria count, since they are outgrown by our bacteria, and they generally do not favour the remediated water environment.



For a complete solution in fighting against, and preventing fish kills resulted by bacterial or viral infections, please check [Bioclean Aqua](#), which is our supplementary product for Bioclean Pond Clarifier bioremediation.

BIOCLEAN POND CLARIFIER - FIELDS OF APPLICATION

- Freshwater Lakes
- Water reservoirs
- Oxbows
- Decoration ponds
- Slow-moving rivers, and canals
- Wastewater treatment ponds
- Tertiary treatment / polishing / stabilization ponds

BIOCLEAR POND CLARIFIER – THE BENEFITS

- Prevents and controls algae growth (non-algaecide, but inhibits the growth of algae by removing N and P sources from the water needed for their metabolism)
- Prevents the overgrowth of aquatic plants and various aquatic weed species
- Improves water transparency
- Improves self-purification processes
- Metabolises natural or artificial, solid and dissolved forms of organic matter in the water column, as a result the transparency of the water significantly improves.
- In the benthic area at the bottom of the lake, microorganisms break down the organic fraction of the sludge in oxidative environment, starting the breakdown from the top of the sediment layer.
- Eliminates Hydrogen Sulphide, free Ammonia and Mercaptan production of the sediment layer, as a result it prevents fish kills and odour complaints.
- Stabilises dissolved Oxygen balance in every layer of the water column, significantly reduces or eliminates the risk of fish kills due to the lack of DO.
- Reduces pathogenic count
- Restores the disturbed ecological balance, providing a better environment for fish and other higher aquatic life forms.
- 100% natural, GMO-free, only beneficial bacteria, isolated from soil, and water.



APPLICATION OF BIOCLEAR POND CLARIFIER – DOSING, TECHNICAL INFORMATION

For determining exact dosages for your lake, reservoir, or pond, please provide us information by sending us our questionnaire filled with information as much as possible:

[Click here for questionnaires!](#)

Whenever you have any questions, do not hesitate to [contact us!](#)

1) FRESHWATER LAKES

Dosage for one treatment:

0.25-3 ppm per treatment based on lake's water volume. Exact dosage rate depends on water quality, ecological state of the lake, and the load of pollution/nutrients.

Number of treatments per year:

4-8 treatments per year depending on water quality, ecological state, the load of pollution/nutrients, and geographic location of the lake.

Entire length of the bioremediation process:

As a thumb rule we can announce that 10-15 years of harm caused by the deterioration of ecological state, and water quality of a lake can be eliminated with a one-season Bioclean Pond Clarifier treatment. It is 100% upon the customer's decision where to stop the process, however the ecological state of the lake is going to start falling if the treatments are stopped early, and the lake has not reached its dynamic equilibrium yet. The state of the dynamic equilibrium of a healthy ecological state can usually be achieved within 3-5 years depending on initial water quality, the rate of ongoing load of pollution/nutrients, and the ecological state of the lake at the start of bioremediation. If the load/penetration of pollution is continuous, and cannot be controlled, a low amount of maintenance dosage of Bioclean Pond Clarifier is recommended after the bioremediation is complete to maintain the dynamic equilibrium of the lake in a good, and healthy state, to ensure that the lake's microbiology is able to cope with the pollution it receives, and maintain self-purification capacity at maximum level.

Timeframe of result expectations:

Restoration of Dissolved Oxygen balance:	After 1st or 2nd treatment
Algae control, improved transparency:	In year 1
Aquatic weed control:	From year 2
Sludge/sediment level reduction:	8-25 cm per year depending on organic content of sediment (the reduction rate of the sediment decreases from year to year, as organic content of the sediment decreases)
Pathogenic control:	In year 1
Reduced risk of fish kills:	In year 1
Water quality improvement:	After the 1st treatment
H ₂ S, free Ammonia, smell reduction:	In year 1 or from year 2

Method for the proper execution of a treatment:

Bioclean Pond Clarifier must be premixed with water before application! Pure water, or preferably the lake's own water should be used! After stirred and mixed well, the suspension of Bioclean Pond Clarifier must be sprayed onto the water surface by **EVENLY COVERING THE ENTIRE WATER SURFACE OF THE LAKE WITH THE SUSPENSION OF BIOCLEAR POND CLARIFIER!**

DO NOT POUR THE DRY POWDER INTO YOUR LAKE! The material loss due to wind, and the inactivated powder remaining on the water surface will not make the treatment economical, your material loss will be decent!

For smaller lakes, treatments can be done from the shore from multiple locations by using a container for the suspension, and a pump with a sprayer. For bigger lakes treatments are done from a boat. Please check our website for more information:

<https://www.malatechwater.com/our-technologies/lake-bioremediation-aquaculture/>

2) SMALLER FRESHWATER (DECORATION/GARDEN) PONDS

Dosage for one treatment:

3-8 ppm per treatment based on pond's water volume. Exact dosage rate depends on water quality, ecological state of the pond, and the load of pollution/nutrients.



Number of treatments per year:

Once per month in season.

Rest is like described in section "1) Freshwater lakes" above.

3) WASTEWATER TREATMENT, TERTIARY TREATMENT / POLISHING / STABILIZATION PONDS

Bioclean Pond Clarifier is also used at wastewater treatment or secondary effluent treatment ponds for algae, aquatic weed, pH control, and sludge reduction.

Dosage for one treatment:

Shock dose (1st treatment): 1-2 ppm per treatment based on pond's water volume. Exact dosage rate depends on water quality.

Onwards: 0.6-1.5 ppm in season, once per month.

If N,P macronutrient levels are high (compared to freshwater standards) in the influent, [Pond Pure](#) is needed as an add-on for algae, aquatic weed, and pH control.

Number of treatments per year:

Once per every 2 weeks, or once per month in season.

Timeframe of result expectations:

Algae control, improved transparency:	In year 1
pH control:	In year 1
Aquatic weed control:	From year 2
Sludge/sediment level reduction:	4-25 cm per year depending on organic content, and influent TSS, Salinity, inhibitor/toxic substances' concentrations etc.
Water quality improvement:	After the 1st treatment
H ₂ S, free Ammonia, smell reduction:	In year 1

Method for the proper execution of a treatment:

Like described in section "1) Freshwater lakes" above.

PACKAGING INFORMATION

The product is available in 40 kg net plastic drums with safety lock, which is the lowest unit for ordering.

STORAGE INFORMATION

Keep the product in a cool and dry place below 30 Celsius. Avoid exposure to direct sunlight.

