

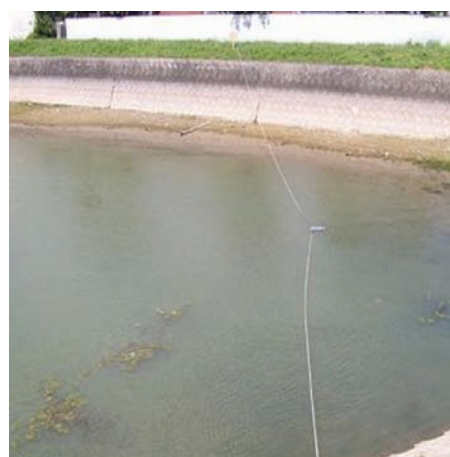
ALGAE and BIOFILM Chemical-free Control and Treatment Solution

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Algae are a large and diverse group of photoautotrophic organisms. They are single celled, colonial or macrophytic organisms, containing chlorophyll a, have simple reproductive structures, and no differentiated true roots, stems or leaves. The green algae are primitive members of kingdom Plantae, though other types of algae are classified outside the kingdom entirely. It is believed that land plants evolved from green algae about 500 million years ago, with fossil records for certain species dating back to approximately 3 billion years.



algae control before



algae control after

Wherever water is being stored, there is a risk of algae problems occurring. Algae growth is often a result of eutrophication, the build up of nitrogen and phosphorus in the water due to pollution, intensive agriculture and lack of maintenance to the water body. When water is stagnant and has a relatively high temperature the chances for algae blooms become even higher.

These blooms may have deleterious effects on the area of water in question, such as floating scum layers, shading of submerged aquatic plants, oxygen depletion, alteration of food webs, suffocation of fish from mucus production and gill interference and even the production of toxins leading to diseases and even death in aquatic animals, livestock and sometimes even humans.

Also in other places where water is being stored algae growth can become a problem. Examples are wastewater and water treatment plants, cooling towers and irrigation and water storage reservoirs. Algae growth in these applications can cause serious problems such as clogging of filters and pumps, reduced efficiency of a cooling tower and a high chemical consumption. In addition, when water is being treated for drinking, algae growth can cause a bad taste and smell to the water.

Algae problems, are detrimental to a number of receptors, so effective control is required. Current methods to alleviate algal blooms can be expensive, problematic, have a further negative impact on the environment or a combination of these factors.

Algae Control

Filamentous algae may be removed physically; however this control method can be labour intensive and provides only temporary control. When using chemical treatments one should consider potential contamination of domestic water supplies and the local ecosystem. Biological control is another option, although thorough research of the potential impacts on food webs must be performed to ensure any introduced species is not detrimental to non-target species.



Solution

There is now a new way to control algae and get rid of your algae problems.

This new innovative technology has been found and developed by the Dutch company LG Sound after 2 years of cooperation with several European universities in a 1,5 million European project. The LG Sonic technology controls algae, biofilm and some types of bacteria by sending ultrasonic sound waves of several specific frequencies into the water, which control the algae by resonance and sound pressure.

To establish optimal algae control, the LG Sonic systems use a 'blend' of ultrasound frequencies of certain power which are emitted into the water by specific transducers. This will enhance the specificity and selectivity of the ultrasonic treatment. The algae are treated with ultrasonic sound waves set in precise frequencies that directly target the cellular structure of the algae. The amount of algae in the water is reduced and controlled in an efficient, cost-effective manner, and further growth is inhibited. Green layers disappear, biofilm formation is prevented, and the appearance and clarity of the water is visibly improved. The continuous use of such a device prevents the water from becoming polluted again.

How does LG Sonic work?

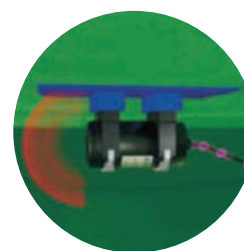
Algae control does not have to be complicated, the LG SONIC technology controls your algae in 3 simple steps:



1- Generate ultrasound

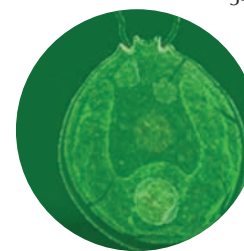
Sound pulses are being generated within the power box. Thanks to the Dc-Mf Technology™, used only by the LG Sonic®, which produces multiple frequencies simultaneously, controlling several algal species at the same time.

These sound signals are sent to the transducer.



2- Transmit ultrasound

The transducer transmits these sound pulses into the water with a very high sound pressure (dB). The sound waves have different frequencies but all lie in the ultrasound range and are thus inaudible and harmless for humans, animals, plants and insects.



3-Damage algae

The high pressure ultrasound emitted by the LG Sonic® targets many different algal structures. Components of algae cells, within the long range of LG Sonic®, oscillate on the sound frequencies. This leads to tearing of different cell organelles such as the vacuole's tonoplast, cell wall or membrane and the gas vesicles of blue-green algae.

In general affected algae will sink to the bottom of a water body and will either be degraded by the existing microorganisms in the water, or can be filtered out. The growth of new algae is directly being prevented by the LG Sonic, which is the reason why toxin release to the water (by cyanobacteria) can be prevented.

The physical reaction of algae to ultrasound depends on the type of algae. A common used differentiation in algae is between green and blue-green algae, also known as cyanobacteria

Green algae

Green algae share many characteristics with plant cells. As in plants, green algae possess a vacuole surrounded by a tonoplast, a cell membrane attached to a cell wall and chlorophyll, in charge of photosynthesis. As an effect of ultrasound, the tonoplast of green algae can rupture, releasing the contents of the vacuole to the inner cell. Besides this, the adhesion of the cell membrane and the cell wall can damage.

Cyanobacteria

Blue-green algae are in fact one of the oldest bacteria. These bacteria share some characteristics with a plant cell as well. For example, the capability to produce energy by absorbing light, called photosynthesis. Blue-green algae are capable of travelling through the water vertically due to their possession of gas-vesicles. The ultrasound waves from the LG Sonic® rupture these gas vesicles, making the blue-green algae sink to the bottom and possibly die by lack

Advantages of the LG Sonic Technology®

Controls algae & biofilm

The LG Sonic technology combines strength, safety and efficiency in one product to control algae without chemicals. Besides that, the LG Sonic technology has very low power consumption.

Beneficial to its environment

The LG Sonic® technology controls algae but is safe for humans, animals, waterplants and insects. Using the LG Sonic® in a lake, the natural balance between all these life forms will be restored leading to a healthier and more stable environment.

Also effective in tanks with a low retention time

LG Sonic® uses the Dc-Mf technology™ which enables the devices to affect several different algal species within a second. Therefore the LG Sonic® technology works fast and efficient enough to be applied in tanks with a low retention time

Reduction of chemicals

By controlling algae and biofilm, the LG Sonic units can assist in reducing chemical consumption in some applications such as Cooling Towers and Swimming Pools.

Effective on large water surfaces

The LG Sonic products can efficiently control algae on a distance up to 186 meter. with a power consumption of just 10 Watt. For reservoirs larger than 186 meters, the biologists from LG Sound can assist you with a detailed plan to install multiple devices for optimal water treatment.

Easy to install and maintain

The LG Sonic devices are being placed in the water body itself, emitting sound waves through your water reservoir.

About LG Sonic

LG Sound is the leading international manufacturer of innovative ultrasonic algae control systems. We believe in Innovation based on knowledge; By constantly innovating our product range and expanding our knowledge, we aim to keep our products and support to the highest standards possible so we can always meet to our clients expectations. In order to reach these goals, LG Sound keeps innovating and putting effort in research to remain at the edge of the market:

For our research and development, certified biologists work intensively together with our technical specialists and market experts. In addition, we cooperate closely with the best universities to ensure we have access to all the relevant techniques and expertise. Some of the universities with whom LG Sound cooperates in research are:

- University of Portsmouth (UK)
- University of Catania (Italy)
- Universität für Bodenkultur Wien (Austria)
- University of Amsterdam - VU (Amsterdam)