



AQUATIC TECHNOLOGIES



LG Sonic How does it work?

1. Generate ultrasound

Sound pulses are being generated within the power box. Thanks to the Dc-Mf Technology™, used only by the LG Sonic®, the power box generates several different frequencies simultaneously and sends them to the transducer. This makes the signal stronger and makes it possible to inhibit several different species of algae.

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.

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. Because many frequencies are used simultaneously different species of algae can be controlled on an efficient manner within a very short time span.

The exact reaction of an algal cell to ultrasound depends, amongst others, on the type of algae. A very common differentiation between algae is between green algae 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.