



Prevent Biofouling with the LG Sonic Industrial Line

- ✓ Prevent the growth of biofouling
- ✓ Reduce chemical expenses
- ✓ Prevent clogging of filters and pumps

Chemical-free Biofouling Prevention Solution

Biofouling in closed-loop systems can result in serious negative side effects such as increased chemical consumption, corrosion, increased power requirements of the system, and health and safety implications due to the growth of Legionella or other potentially harmful organisms.

LG Sonic Industrial Line

The LG Sonic Industrial Line provides a cost-effective solution to prevent biofouling with the use of ultrasound technology.

The Advantages of our Technology

- ✔ Prevent the growth of biofouling
- ✔ Reduce chemical expenses
- ✔ Prevent clogging of filters and pumps

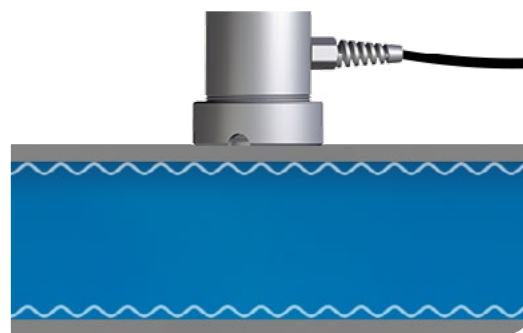
The solution is to install one or multiple systems that transmit specific ultrasonic parameters to prevent biofouling

Within the Industrial Line, there is an Industrial Wet or Industrial Dry option available depending on the specific situation.

LG Sonic Industrial Wet



LG Sonic Industrial Dry

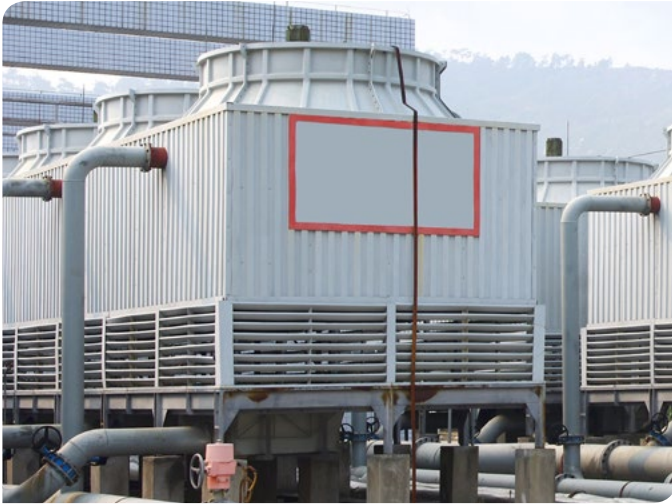


How the ultrasound is transmitted	Throughout the water body, within a pipe or mounted alongside a submerged surface	Through the dry side of a surfaces such as a pipe. The ultrasound is effectively transmitted through the material
Which problem will be solved	Reduce floating algae, prevent the growth of biofouling on the walls	Prevent the growth of biofouling in heat exchanges and pipes.
Typical applications	Cooling basins Clarifiers	Heat exchangers Sea chests
Treatment range	Up to 30m/100ft per device	Up to 10m/30ft per device

Prevent Biofouling in Industrial Systems

The LG Sonic Industrial Line is an advanced system that emits specific ultrasonic parameters in order to prevent biofouling in industrial systems.

Cooling Towers



Prevent biofouling formation and lower algae, bacterial counts, and chemical consumption

Clarifiers



Prevent the growth of biofouling on the weirs and walls of the clarifier

Sea Chest



Prevent biofouling formation, corrosion, and increased power consumption

Heat Exchanger



Improve efficiency of heat exchanger and cooling system

Over 10,000 LG Sonic algae and biofouling control products have been successfully installed in a wide range of applications in 52 different countries

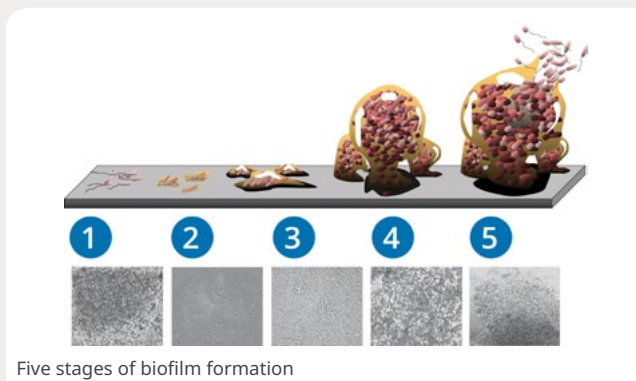
Ultrasonic Biofouling Prevention Treatment Process

LG Sonic has more than 15 years of experience in applying ultrasound technology to prevent biofouling.

How Ultrasound Prevents Biofouling Growth

Specific ultrasonic frequencies, waveforms and amplitudes can be utilised to prevent the formation of biofouling. Biofilm formation starts by bacteria attaching to a surface. The ultrasonic sound waves of LG Sonic create resonance around the solid surfaces within the water, thereby preventing bacteria to adhere to a surface.

1. Prevent bacteria from settling on a surface in the primary stages of biofilm formation
2. Alter the structure of an existing biofilm, eventually breaking it down
3. Control potential algae attaching to a biofilm



Ultrasonic treatment of LG Sonic can reduce algae growth by 70-90% and prevents the growth of biofouling

Benefits of LG Sonic Biofouling Prevention

- ✓ Multiple ultrasonic programs for effective biofouling prevention
- ✓ Ultrasonic treatment allows for the reduction of chemical consumption
- ✓ No use of cavitation for a longer product lifetime



LG Sonic Industrial Wet



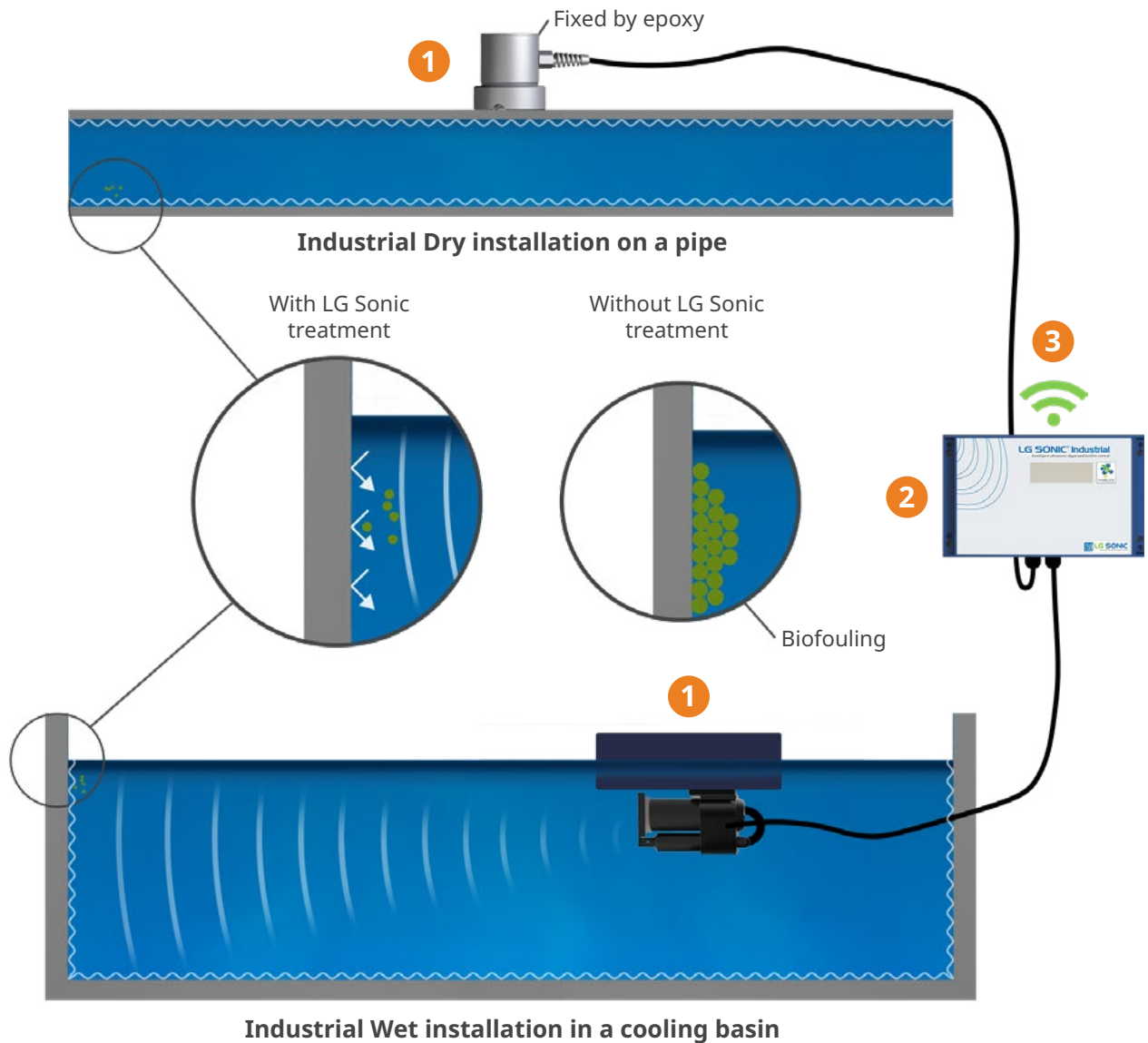
LG Sonic Industrial Dry

No Use of Cavitation

Some ultrasonic biofouling control solutions use cavitation to prevent biofouling, which is a phenomenon where high-power ultrasound causes intense heat pressure and the formation of hydrogen radicals. These radicals may kill bacteria and other organisms but also cause oxidation reactions and may degrade anticorrosion layers.

- ✓ Not harmful for marine life
- ✓ Adaptable ultrasonic frequencies for effective treatment
- ✓ No side effects on the anti-corrosion layer
- ✓ Longer product lifetime
- ✓ Longer treatment distance

LG Sonic Industrial Line Features



1 Ultrasonic transmitter for effective biofouling prevention

2 Weatherproof control box

- ✓ Weatherproof design to protect against outdoor conditions
- ✓ LCD display with control buttons to select 12 different ultrasonic programs
- ✓ It is possible to add multiple ultrasonic transmitters to one control box for the treatment of multiple tanks or water surfaces with curves

3 Remote control monitoring to prevent frequent site visits

- ✓ GSM/GPRS control allows the user to monitor and change the ultrasound program remotely
- ✓ Receive status updates and alerts when power outages occur.

LG Sonic Industrial Wet Features

Ultrasonic transmitter for effective biofouling prevention



- ✔ Treatment range up to 30m/100ft per device
- ✔ Integrated Aquawiper™, an automatic cleansing system for the ultrasonic transmitters
- ✔ Chameleon Technology™, adjusts the ultrasonic program to the specific conditions

LG Sonic Industrial Dry Features

Ultrasonic transmitter for effective biofouling prevention



- ✔ Treatment range up to 10m/30ft in diameter per device
- ✔ No use of cavitation
- ✔ Chameleon Technology™, adjusts the ultrasonic program to the specific conditions

Optional

Installation bracket

Bracket to install LG Sonic Industrial Wet without a float. Easy removable for maintenance checks.

Check the ultrasonic transmitter with the ultrasonic tester

Device to check whether your LG Sonic device is still working, sending the correct frequency program and if the ultrasound is being spread throughout your whole water body.

Technical Specifications

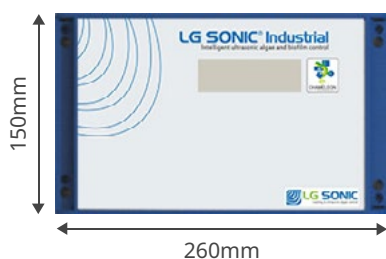
LG Sonic Industrial Wet

Ultrasonic transmitter	<ul style="list-style-type: none"> • Unique Chameleon Technology™ • 12 pre-installed ultrasonic programs • Max freq/program, 80 • Ultrasonic generator integrated in the ultrasonic transmitter • Transmitter cable, 20m/65ft (extension possible) • Float
Control box	<ul style="list-style-type: none"> • Choose between 1, 2 or 4 transmitter outputs to one control box • LCD display with control buttons • Remote control monitoring, GSM/GPRS • AC input voltage, 100-240V AC, 50/60hz • DC input voltage, 24V DC • Energy consumption, 25 Watt • Weatherproof design, Aluminum • Ingress protection, IP67
Aquawiper™	<ul style="list-style-type: none"> • IP67 underwater housing • 360° turning angle • Industrial-designed brush

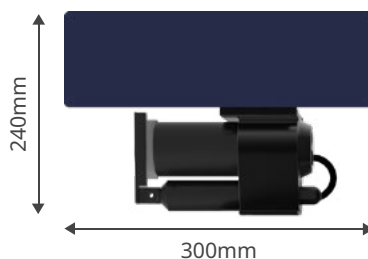
LG Sonic Industrial Dry

Ultrasonic treatment range	• 10-15 meter in diameter
Cable length	• 20 meter
Power consumption	• 25 Watt
AC input voltage	• 100-240V AC, 50/60hz
DC input voltage	• 24V DC
System weight	• 2 kg
Mounting foot	• Stainless steel 304

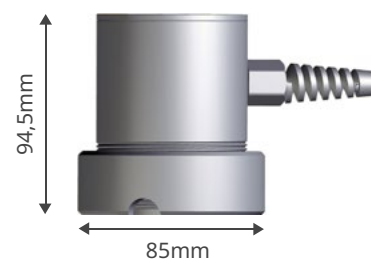
Control box



Industrial Wet



Industrial Dry



Biofouling Prevention Cases

The LG Sonic Industrial Line has been successfully installed in a wide range of applications, such as cooling towers, clarifiers and treatment plants

Biofouling Prevention in a Cooling Tower

Al Futtaim Cooling district plant in Dubai incorporated the LG Sonic technology into their chemical treatment program to reduce the biocide consumption in the cooling towers and improve the water quality.

Results

Using LG Sonic devices reduced chemical dosage for water treatment and control factors that may cause problems, such as corrosion, scaling, and microbial activity.

- ✓ Up to 69 % reduction in biocide dosage
- ✓ Up to 53% reduction in anti-scalant dosage
- ✓ Microbial analysis of the water after tests of satisfactory quality and within specific limits



Biofouling Prevention in a Wastewater Treatment Plant



Several LG Sonic devices were installed in a Wastewater Treatment Plant (WWTPs) in Melbourne, Australia to prevent biofouling. High algae concentrations created problems for process performance and increased operating expenditure for cleaning and maintenance activities.

Results

The LG Sonic devices show a viable solution to prevent biofouling in the balance tanks. Significant operating expenditure related to cleaning maintenance has been saved.

- ✓ Reduction in cleaning and maintenance
- ✓ Less frequent backwash required of tertiary cloth filters
- ✓ Aesthetic improvement in balance tank

Biofouling Prevention in a Clarifier

Several LG Sonic devices were installed in the SAB Miller Clarifier in Tocancipa Brewery, Colombia to control filamentous algae caused by biofouling. The algae attached to the biofilm was identified as suspended and was growing on walls and water channels of the clarifiers, reducing process efficiency and increasing the cleaning efforts of the plant

Results

Extensive testing showed the LG Sonic devices had a significant impact on the filamentous algae and bio-corrosion. Workers at the brewery didn't need to dose hydrochloric acid during maintenance, which resulted in less time required for the maintenance and substantial improvement of safety conditions for workers.



- ✓ **Reduction of filamentous algae growth**
- ✓ **Lower maintenance**
- ✓ **Reduction of bio-corrosion on the clarifiers' walls**

Biofouling Prevention in a Water Treatment Plant



Figure 1: Before treatment

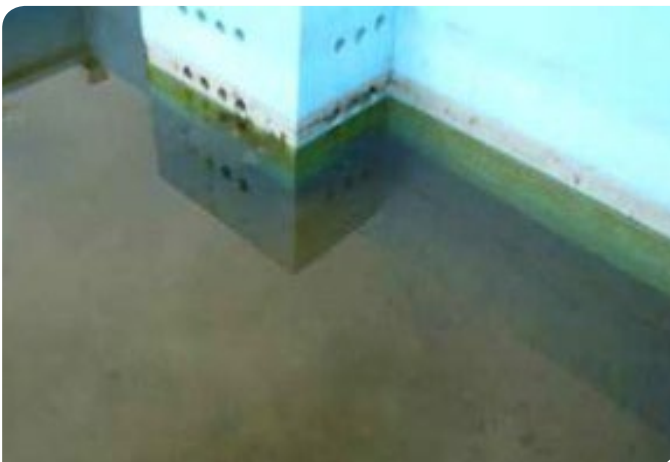


Figure 2: After treatment

A potable water treatment plant in Kuse (Japan) installed several LG Sonic systems in the sand filters to prevent the formation of biofouling. Filamentous algae grew abundant in the sand filters, creating problems with the taste of the water and clogging of the filters.

Results

After several weeks of treatment, it was visible that the number of filamentous algae has decreased. The filters were not clogged due to less biofouling formation and the maintenance of the filter beds could also be reduced.

- ✓ **Reduction of biofouling formation**
- ✓ **Reduction of filamentous algae**
- ✓ **No more clogged filters**



Over 10,000 LG Sonic algae control products have been successfully installed in a wide range of applications in 52 different countries

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