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About **biofilm**

Biofilm, a group of micro organisms, commonly observed as a slimy layer, occurs anywhere water accumulates, and causes many problems for professional breeders:

- Clogged pipes and drinking nipples.
- Development of pathogen bacteria.
- Reduction of the effectiveness of medicines which are mostly administered via the drinking water.
- Leaking drinking nipples which causes wet stable floors.

Most biofilm related bacteria are extremely difficult to eradicate with conventional chemical and mechanical methods and require constant attention to avoid infections. This biofilm protects the present bacteria and can produce harmful toxins. **Salmonella** is capable to develop a biofilm under several circumstances, as well in biotic as in abiotic surfaces. This biofilm protects these bad bacteria against disinfectants and antibiotics. **Salmonella** infection can be avoided by preventing the formation of biofilm.

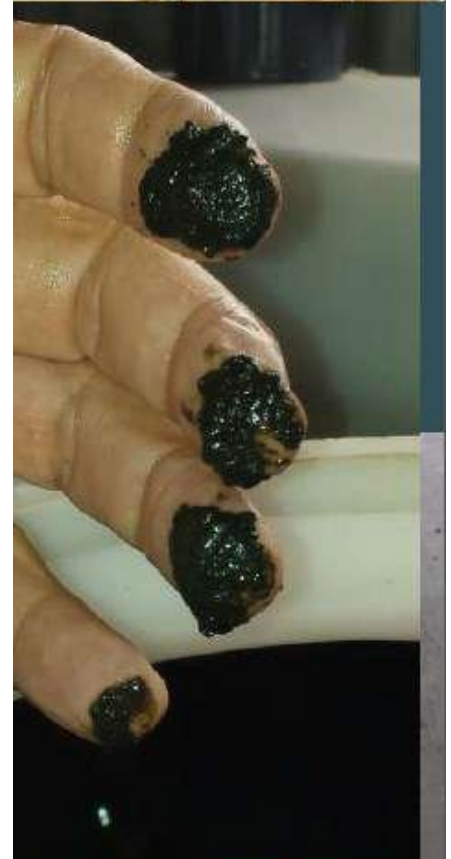


Resistant biofilm

Using chemicals to clean the pipes is not without risk, as the toxic residue can be harmful for the animals or crops. Moreover, the constant usage of chemicals can make biofilm resistant. With frequent usage and treatments, biofilm can become up to 500 times more resistant to chlorine.

This resistant biofilm can't be removed with the conventional methods, and can remain a habitat for certain tenacious germ strains. Chemicals will have no impact on them, especially in small gaps, where the most harmful and resistant bacteria such as e-coli or enterococci reside,

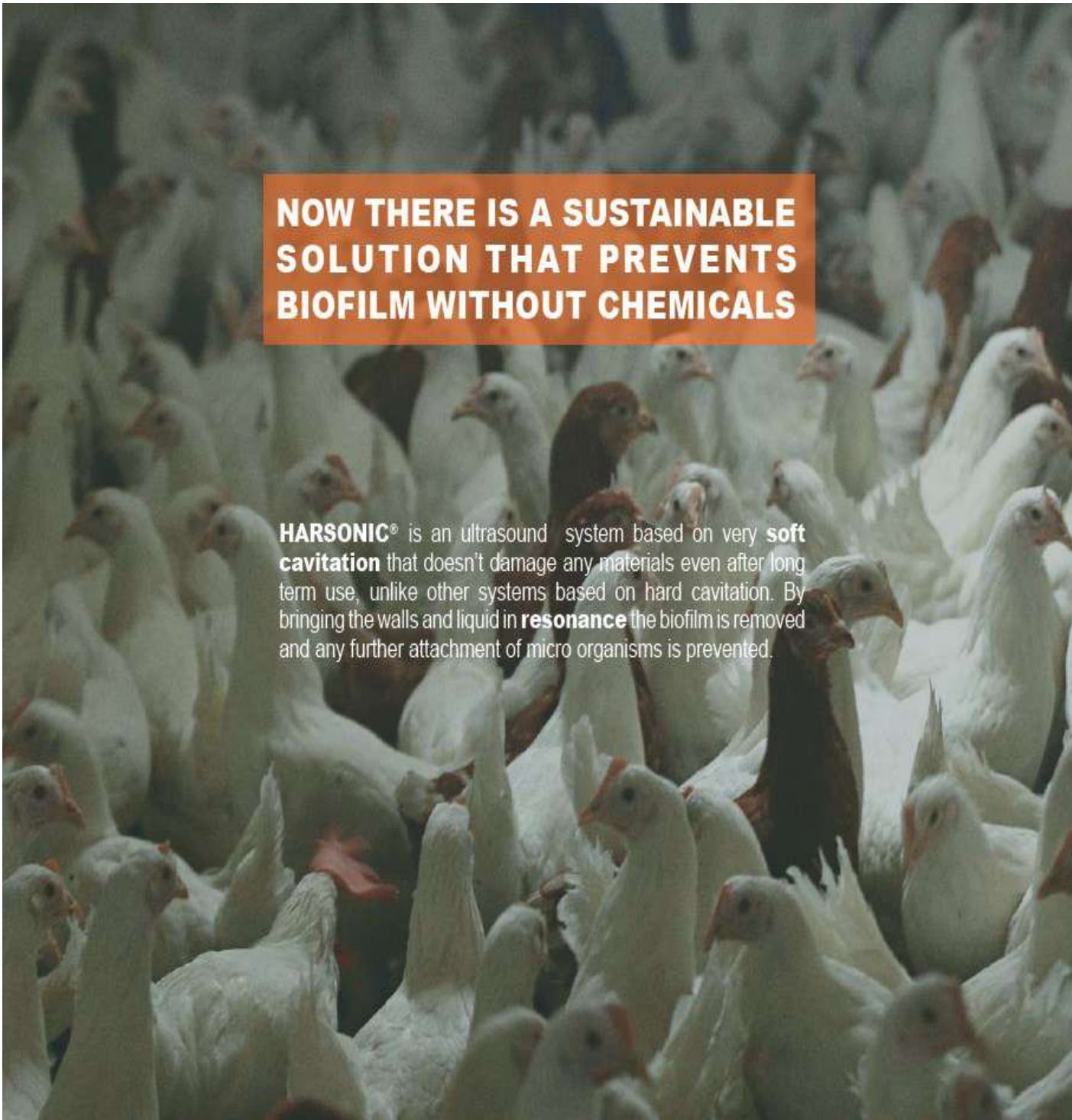
Fact: none of the conventional cleaning methods are really effective against **resistant biofilm**





A very **high level of hygiene** in drinking and irrigation lines is required to keep live stock and crops **disease free**. Most **biofilm** related bacteria are extremely difficult to eradicate with conventional chemical and mechanical methods and require constant attention to avoid infections.





**NOW THERE IS A SUSTAINABLE
SOLUTION THAT PREVENTS
BIOFILM WITHOUT CHEMICALS**

HARSONIC® is an ultrasound system based on very **soft cavitation** that doesn't damage any materials even after long term use, unlike other systems based on hard cavitation. By bringing the walls and liquid in **resonance** the biofilm is removed and any further attachment of micro organisms is prevented.



HARSONIC® ultrasound biofilm control system

- is suitable for **all water and other liquid nutrient** transportation lines
- avoids the **attachment** of biofilm
- **reaches every gap** that any other mechanical cleaning method can't reach
- is very **easy** to install and to maintain
- **reduces** or even totally **avoids** the usage of **chemicals** and **antibiotics**
- has a very **low energy** consumption
- has a **continuous cleaning** effect
- requires a very **low investment**



HARSONIC®

ULTRASOUND BIOFILM CONTROL

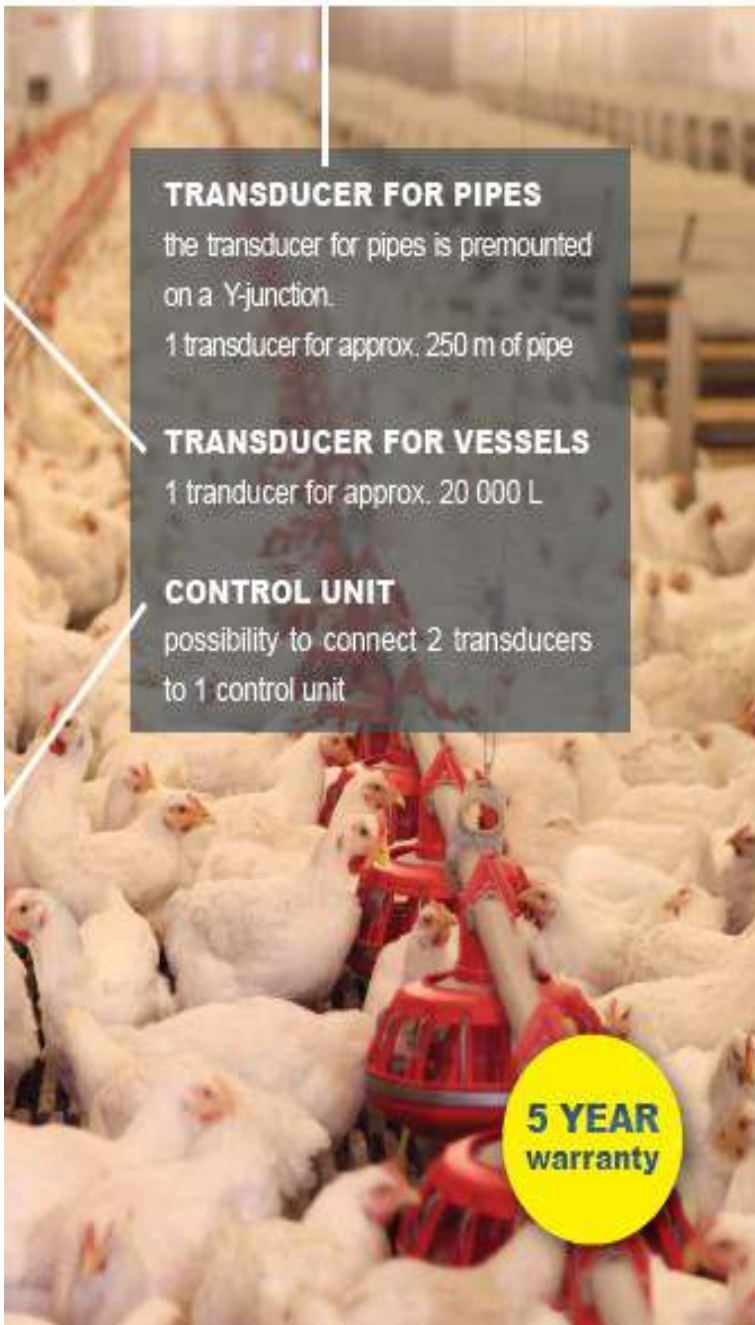
How does it work?

HARSONIC® is a biofilm control system in which **ultrasonic** vibrations are spread by transducers into a liquid. By breaking the vacuole of **algae**, these vibrations prevent micro organisms to attach to the walls and to form **biofilm**. Ultrasonic vibrations can cover very long distances. The effectiveness of the vibrations is reinforced by the system's patented **HS-Technology**, which makes it the only solution against **resistant biofilm**.

- reduced usage of antibiotics
- improved disease control
- better daily growth rates
- robust health - better uniformity
- strongly reduced mortality

The only effective solution
against **resistant** biofilm





TRANSDUCER FOR PIPES

the transducer for pipes is premounted on a Y-junction.

1 transducer for approx. 250 m of pipe

TRANSDUCER FOR VESSELS

1 transducer for approx. 20 000 L

CONTROL UNIT

possibility to connect 2 transducers to 1 control unit

About HARSONIC®

The **HARSONIC®** technology was developed in Belgium, and originated in the marine industry for defouling ship hulls, boxcoolers etc. Being very successful in that industry, **HARSONIC®** developed further applications for several other industries where biofilm is a serious problem, which is about every industry that uses water of any kind. Together with the biofilm, every other fouling that attaches to the biofilm is also avoided, such as limescale, rust... Numerous tests being done in Belgian as well as in foreign universities did not only prove its effectiveness, it also proved that **HARSONIC®** doesn't have any impact on living creatures, nor does it influence any electronic devices.

System features and benefits

- removes biofilm permanently **without chemicals**
- very **low investment**
- very **easy** to install
- needs little or **no maintenance**
- extremely **low electrical consumption**
- **cost savings** on cleaning products and labor
- **improves the effect** of cleaning/disinfecting agents
- ultrasound vibration reaches every **gap and folds**
- standard with a **5 year warranty**

CONTROL UNIT (CU)

Dimensions	180 x 120 x 90 mm
Transducers / CU	1 or 2
Power supply CU	12VDC 6,3 A
Power supply inlet	100 - 240 VAC 50/60 Hz
Power consumption	6 W

to be mounted in an IP67 electrical cabinet

TRANSDUCERS

Diameter (for pipes)	50 mm (3 kg)
Diameter (for tanks)	63 mm (4 kg)
Height	110 mm
Protection index	IP69
Temperature range	-30°C to 100°C

HARSONIC® meets the following standards

- RoHS-directive 2002/98/EC
- EMC-directive 2004/108/EC
acc. test report FMEC/EMC/1306/53
- LVD-directive 2006/98/EG

