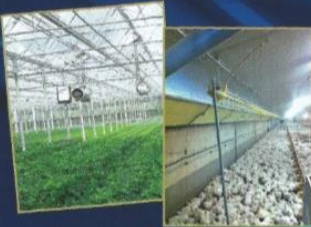


Other Applications of the Harsonic® Products



For **PERMANENT** removal
of **BIOFILM**
without chemicals !!!



Harsonic® Tubes - Tanks Agri

- Cleans all kind of tubes and irrigation-systems
- Protects plants & animals from disease and reduces the need for medication and pesticides.



Harsonic® Boats

- cleans the hull of your boat without having to take the boat out of the water!!
- avoids annual maintenance costs for the removal of algae and barnacles and reduces the costs of antifouling



Harsonic® Coolingtower & Closed Waterstorage

- Avoids algae and bio-film in cooling-towers and every other closed storage for fluids
- To remove biofilm which contain harmful bacteria such as Legionella
- To reduce maintenance and chemical products.



WWW.BIOFILMFREE.COM INFO@BIOFILMFREE.COM

+32 475 253 007

 **BIOFILMFREE**

HARSONIC® FOR BOXCOOLERS



Harsonic® for Boxcoolers
offers you a permanent solution
for a maintenance-free Boxcooler !

**Perfect protection is guaranteed
under all conditions.**





On a seagoing vessel there is in general a lot of cooling required. This is done traditionally, by using seawater, bringing into the vessel through the sea chest, and then use this seawater for cooling.

In principle, a boxcooler is a pipe bundle, as known from tubular heat exchangers, which is put direct in the seawater, whereas the seawater can be used direct for the cooling of the different processes on a vessel.

These pipe bundles are installed in special compartments, where the ship is open to the sea so all time seawater is around the tubes of the box cooler.

Bringing in huge amounts of seawater inside a vessel, boxcoolers are always potential fouling victims. Barnacles, mussels, algae, and other types of shellfish grow on the tubes of the boxcooler and thus affect its heat transfer function.

Classical methods, as using chemicals, to avoid scale or even sea growth are not possible to use in this case, as the chemicals would be needed to put direct in the seawater, what will never work due to the amount of seawater and as well due to the regulations and other authorities. So what will happen over time, the box cooler will be full of all kind of marine growth.

So the procedure today is as soon the cooling is not sufficient anymore, the box cooler has to be removed, cleaned and brought back in operation. Of course during the cleaning the vessel can't be in operation, so this cleaning is very expensive for the ship owners.



Harsonic® for Boxcoolers offers you a permanent solution for a maintenance-free Boxcooler !

Perfect protection is guaranteed under all conditions.

The functioning principle is based on transmitting ultrasound vibrations and very strong multiple, high frequencies to remove the biofilm. Although the transmitting is extremely powerful, the consumption is only 6W.



By installing several transducers (depending on the size of the boxcooler), connected to a control unit, we remove completely the biofilm. The biofilm is the slimy layer which is needed for all organic life to attach to. This means, as long as there is no biofilm, there will be no barnacles, algae, nor mussels on the pipe bundles.

Advantages

- Harsonic® for Boxcoolers gives increased cooling efficiency and improved reliability
- Harsonic® for Boxcoolers means substantial savings on maintenance costs and there is no need for dry docking
- Harsonic® for Boxcoolers avoids the use of chemicals and protects the environment

info@biofilmfree.com | +32 475 253 007 | www.biofilmfree.com