



Case study "boxcoolers fishing vessel"



## The case

The fishing boat treated in this case mainly sails in the North Sea: salty, fouling-sensitive waters. The vessel has a seawater cooling system consisting of three box coolers (one PS, two SB).

The skipper had been experiencing cooling problems for some time, for which he was looking for a solution. Hard growth settled between the cooler bundle every time, causing cooling problems: the flow through the cooler was blocked.

This study describes what the problems were for the vessel, why it chose Ultrasonic Antifouling and what the result is after 31 and 23 months.





# The test

The skipper wanted to assess the operation of the Ultrasonic Antifouling system with his own eyes. For this reason, he decided, in consultation with the shipyard, to only protect the cooling system on one side of his fishing boat. The starboard side remained unprotected. In this way, the skipper wanted to compare the condition of the coolers on both sides.

In October 2018, the SH02 system was installed on the port side (2 transducers). One transducer is installed on the cooler lid and one on the side of the seachest. The vessel had just been cleaned at the time, which is a precondition for proper functioning of the Ultrasonic Antifouling System. There has to be started clean, to keep it clean.



One SH02, with the seachest in the background



## Preventive effect

The Ultrasonic equipment produces signals between 20 and 60 kHz, inaudible to the human ear. These sound waves initiate a cavitation process, where the positive pressure of the sound wave produces microscopic bubbles that implode at lightning speed at the negative pressure. Very high temperatures and up to 2000 bar of pressure are produced in a snapshot.

This cavitation fights single-celled bacteria, which together form the biofilm layer. However, it is on such a small scale that the material to be protected is not damaged or affected. The slimy, green layer forms the foundation for multicellular organisms, such as larvae of mussels or algae. Without this biofilm they have no chance to adhere to a surface and the other phases of growth are therefore also excluded.

When the first phase of fouling has already formed, the Ultrasonic Antifouling system can no longer keep the fouling away, it can at most slow down the growth process of the fouling.







# The testing period

After installation, the vessel sailed for 8 months and experienced no cooling problems. Without assessing the condition of the coolers, this was enough for the skipper to equip the other side with the system as well. However, these coolers weren't clean: so the coolers should still show a difference in fouling because they weren't protected from the start.

In May 2019 2 x SH02 (4 transducers) was installed on the starboard coolers and seachest after the vessel had been sailing for 8 months without protection. One transducer was installed per individual cooling circuit and two on the side of the seachest.



Installation on starboard



### The result

Port side cooler condition after 31 months: The cooler is clean except for some outer pipes (of each cluster of 5 pipes). There was an amount of hard growth on it. These do not impede the flow through the box cooler and therefore do not cause a loss of heat transfer.



The condition of starboard side coolers 23 months after installation: There is a lot of fouling in the bundle between the pipes, in contrast to the cooler on port side. A lack of flow through the cooler bundle eventually leads to too little heat transfer to the water and thus to cooling problems.





# The conclusion

The port side coolers have remained largely clean and have not caused any cooling problems. The coolers on the starboard side have considerably more fouling on the coolers than on the port side and will unfortunately have to be replaced. The difference in fouling is of course due to the fact that the coolers on starboard side weren't clean from the start.

The importance of the preventive effect of the Ultrasonic Antifouling system clearly emerges here. Starting with a clean surface is essential for good sound transmission.

Altogether, the customer was satisfied. Despite the growth on the coolers on starboard, the clean coolers on portside show that the Ultrasonic Antifouling system is doing its job and cooling problems are prevented.



#### LAMERS SYSTEM CARE B.V.

Protonenlaan 4b | 5405 NE UDEN | The Netherlands T: +31 (0) 413 275 647 Ch. Of C. 80139418 | VAT Nr. NL861565241B01 info@LSCare.nl | www.LSCare.nl



