

# Antifouling

## Hull and box cooler

Fouling can be divided into three types:

Micro fouling (biolayer)

Soft fouling (algae)

Hard fouling, such as barnacles, oysters and mussels.

According to TNO, growth of hard fouling can cause an additional resistance of up to 69%. Studies show that if a small part of the hull has grown, there is already a substantial resistance increase.

Tens of percent extra fuel consumption is no exception. In addition to more fuel costs, this also means more CO<sub>2</sub>, NO<sub>x</sub> and sulfur emissions.

USAF™ is a high power ultrasonic transmitter that produces micro bubbles. During the imploding of these bubbles, pressure waves arise in the water.

The larvae of crustaceans will not adhere to the ship within the pressure wave range. By mounting various USAF™ units on the ship, it remains free of hard fouling. In combination with a hard smooth paint, micro and soft fouling can also be combated.

For the ship's hull the system only works in the port, during sailing is not necessary.

## USAF™ to combat fouling

For hull and coolers

Environmentally friendly

Saving noise at sea

No chemicals

Safe pressure waves

Pressure waves expel larvae

Less propeller wear

Scientifically proven

Tested in practice

Marine mammals no problem

Patent NL 2000797





## Smooth skin substantially reduces noise at sea

USAF™ units have a range of 50 meters depending on the application, which means that few transmitters are required per ship. Which of course saves costs. These channels will produce a small amount of sound in the port. At sea, smooth skin will produce a lot less noise, because the extra fuel is largely converted into sound on a ship with fouling. More resistance of a ship means more power of the engines and more thrust of the propellers, so more noise. The swirling of the water around the barnacles will also cause noise.

Research by the US Navy shows that marine mammals have no problem with USAF™. Because the units are only working in the port, it is certainly not a problem at sea. At sea there is only much less noise, due to the smooth hull. Less thrust means less cavitation at the propeller, so less pit corrosion of the propeller blades.

Special units are available for the box coolers that work at short distances. USAF™ units are maintenance-free. No spare parts needed on regular base.

USAF™ saves the environment and your wallet



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