Hydroacoustic Antifouling Systems

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Biofouling has a major impact on the global shipping industry. The fouling demands extensive efforts to clean the fouled vessels, increases the expenses for the shipping companies and worsens a number of environmental problems, such as carbon dioxide emissions due to increased drag, or the transport of organisms outside their habitat. In the past, toxic paints were found to be the solution for this problem. The ban of TBT (tributyltin), because of its negative impact on the environment, has led to the research of several other alternatives. Until now, however, no other equally effective product as TBT has been found.

Nowadays, scome scientific evidence points towards hydroacoustic antifouling systems. According to its manufacturers, hydroacoustic antifouling systems are an eco-friendly solution to biofouling on merchant ships. The system consists of transducers at the inner side of a ship's outer hull which emit acoustic ultrasound waves. The alteration of positive and negative pressure created by these waves result in cavitation bubbles. These bubbles make the hull an unattractive environment for the barnacles and mussels to grow on. The second working principle is resonation, capable of destroying single cell organisms, which are the feeding ground for fouling organisms. Studies have shown that the use of these acoustic antifouling systems are working well on specific frequencies, exposure time and amplitude. An hydroacoustic antifouling system is capable of keeping the outer platting of vessels free of the fouling barnacle *Amphibalanus amphitrite*. Therefore, a frequency of 23 kHz, an exposure time of 300 seconds and an amplitude of 20 kPa is the optimal configuration. (Shifeng, 2012). Before implementation of hydroacoustic antifouling systems, further research is still be done to investigate the impact of ultrasound on other marine life, as the frequencies used are within hearing range of sea mammals and pinnipeds.

SHIFENG, G. (2012).*A Study of Ultrasonic Effects on the Marine Biofouling Organism of Barnacle, Amphibalanus Amphitrite*, Doctoral dissertation, National University of Singapore.