The future of antifouling technology in a carbon-constrained industry

By Philip Chaabane, CEO, I-Tech AB

Achievement of IMO's ambitious 50% reduction in shipping's carbon emissions by 2050 target will not be an easy undertaking. However, ship owners and managers may take some solace in the fact that the technological solutions required to realistically attain such levels of emissions reduction already exist and are available for deployment as and when required.

This is certainly the case for hull coatings. However, a shift towards the adoption of advanced, high-performance antifoulings that successfully safeguard optimum hull performance in oceanic regions with growing biofouling risk and for vessels with varying activity can be anticipated in the future.

The establishment of biofouling on the hull, both by microorganisms such as seaweed, algae, slimes and sponges, and macro organisms such as barnacles, molluscs and tube worms create a significant impact on the hydrodynamics of a ship. Increased added resistance (also known as drag) on the hull forces a ship to burn more fuel to maintain the same speed through water. More tonnes of bunker fuel consumed converts into more tonnes of CO2 emitted to the atmosphere.

A 2013-published ICCT report entitled 'Long-term potential for increased shipping efficiency' pinpointed the use of hull coatings as being one of the best emission abatement strategies for fuel use and CO2 reductions, potentially 10% fuel savings and over 100 million tonnes of CO2 emissions saved from the global fleet.

With global biofouling hotspots intensifying as a result of oceanic warming, the impact of hull fouling will only continue to increase the industry's CO2 emissions. The hull of any ship spending time in 'biofouling hotspots' acts as a magnet for millions of aspiring biological hitchhikers. When voyaging in and out of, or idling at anchor in warm waters, even a small accumulation of biological matter can add thousands of dollars per day to a ship's operating costs due to increased tonnes of fuel consumed.

Barnacles can be particularly troublesome due to their ability to significantly increase frictional resistance. Once established, the encrusted colonies of these hard-shelled organisms on the ship hull are difficult to remove and the abrasive cleaning methods required can damage the hull coating.

When taking all aforementioned issues into account, it becomes clear that approaches to antifouling technology use will evolve over the coming decades. It will become increasingly imperative for ship operators to take a future-proofing approach to biofouling prevention. Many owners are choosing to protect their vessels' hulls against barnacle attachment by using antifouling coatings that contain Selektope.

Developed by Swedish biotech company I-Tech AB, Selektope is an ingredient for marine coatings that repels barnacles from the hull by temporarily activating the swimming behaviour of barnacle larvae, making it impossible for them to settle and take hold. The effects of the neurological scrambling induced when the barnacle larvae are exposed to Selektope leaching from the hull coating is temporary, with the larvae returning to normal functional capacity when outside of the Selektope exposure zone.

To date, the technology has been deployed to protect the hulls of hundreds of vessels against barnacle fouling since the launch of the first commercial 60-month antifouling systems in 2015.