ANTIFOULING TECHNOLOGY – PREPARING FOR THE FUTURE

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While marine coatings have developed significantly over time, it is essential that as an industry, we continue to evolve as the world around us changes. The shipping industry is currently preparing for new regulations and legislation such as the International Maritime Organization's (IMO) Marpol Annex IV 0.5 per cent global sulphur emissions cap, which will put additional pressure on operating costs and requirements.

But it does not end there, the IMO has also committed to reducing the total annual greenhouse gases (GHG) emissions from commercial shipping by 50 per cent compared with 2008 levels by 2050. This is no small feat and will need radical changes to operations across the board.

It is widely known across the maritime industry that fuel consumption is greatly influenced by the quality of the antifouling system used, so coatings have a significant role to play in meeting future emissions regulations. Currently there are three principal technologies being used to combat fouling; antifouling paints, fouling release coatings and fouling defence coatings.

Antifouling paints are chemically active coatings which act on marine organisms by inhibiting or limiting their settlement on a ship's surface. Fouling release paints are non-chemically active coatings which prevent or reduce an organism's adhesion by physical means, such as through the creation of an exceptionally smooth hull. Fouling defence coatings, a relatively new coating system, takes the best of both technologies to achieve outstanding fouling prevention by combining smoothness with only a fraction of the active ingredients used in the antifouling paints. Each brings specific benefits, but only one brings us significantly closer to meeting future industry regulations.

Protecting our environment is the future

Fouling defence coatings are vital elements in the efficiency chain and can make a significant impact in reducing operational costs and the environmental footprint of the vessel operator. At Hempel, with over 100 years' experience, we pride ourselves in delivering coatings for the future and believe that our most advanced hull coating to date – Hempaguard X7 – is one such solution.

Hempaguard is the first coating to incorporate our Actiguard technology that took over five years to develop and is the only paint to combine both silicone-hydrogel and advanced biocide control in a single coating. It delivers six per cent fuel savings compared with best-in class antifoulings over the entire docking interval, even if the vessel is idle for extended periods (up to 120 days) or changes its trading patterns. This facilitates unrivalled flexibility in fleet utilisation.

To meet the significant environmental challenges that we – as a society, and as an industry – face over the coming decades, coatings technology must build upon on existing solutions and the understanding that each vessel has its own requirements. We must also recognise that shipowners will always want effective hull coatings that not only meet industry regulations but which also improve their bottom line. But time does not stand still, and we must take steps now in order to ready ourselves for future industry regulations. The best approach for us all is to accept the challenge of more stringent environmental regulations as an opportunity to work, as an industry, towards a shared goal.

By Catherine Austin, I-Tech AB

With global biofouling hotspots intensifying as a result of oceanic warming, the impact of hull fouling on the profitability of a ship's operations will continue to generate an indefinite commercial headache for operators. Growing regulatory movement against the transportation of invasive aquatic species (IAS) by the biofouled hulls of the international shipping fleet is also creating a huge drive towards the use of advanced antifouling technologies, and will continue to do so into the future. In certain regions, strong sanctions are being imposed on heavily fouled ships, resulting in port entry refusal until offending biological hitchhikers have been removed. On an international level, the IMO, following its successful campaign to clamp down on IAS transfer via ballast water, has recently set its sights on hull fouling.

Ships laying idle in biofouling hotspots due to economic conditions, or those stuck in congestion at ports, act as a magnet for barnacles and other marine organisms. Long identified as being 'public enemy number one', the hard-shelled design of barnacles particularly creates a huge amount of hydrodynamic drag. Therefore, regulations that seek to restrict ship emissions, such as the incoming Global Sulphur Cap 2020 that will impact bunker fuel prices as ships switch from HFO to burning lower sulphur fuels and alternatives, will force operators to adopt antifouling coatings that successfully safeguard optimum hull efficiency in an effort to reduce bunker fuel bills.

A tricky guest to get rid of thanks to their super strong non soluble glue, barnacles resist removal by cleaning techniques deployed for soft fouling organisms such as slimes and weeds. More abrasive procedures are required to remove the calcareous crust of a barnacle colony and these practices usually result in damages to the hull coating and great costs incurred to the operator – again, not good for the bottom line.

When taking all of the aforementioned issues into account, it becomes clear that approaches to antifouling technology use will evolve over the next couple of decades. Demand for antifouling coatings that guarantee fouling prevention performance regardless of a ship's trading pattern, activity and extended periods spent static at anchor, will increase. Already coating manufacturers are innovating, creating advanced antifouling coatings inclusive of novel technologies to put their products one step ahead of competitors, to offer the much-needed solution to biofouling.

However, the future may hold the emergence of some new technological innovations in the field of antifouling. Over the next 10-20 years, paint manufacturers are more likely to use the technology toolkit that is already available for deployment to futureproof the global fleet against biofouling.

One significant solution in the antifouling tech toolkit is I-Tech's non-metal, organic active agent for antifouling coatings: Selektope. When exposed to Selektope, barnacle larvae are repelled from the ship hull, kept in swimming mode with a non-fatal effect. This revolutionary bio-tech approach to fouling prevention is controlled by the activation of the barnacle larvae's octopamine receptor and is completely unique in its application within hull coatings.

Since I-Tech's decision to bridge bio-technology into the marine coatings industry, multiple commercial products have been launched containing Selektope. Performance results indicate that ships using Selektope continue to sail barnacle-free years after initial application during a drydocking, or after sailing out of the shipyard. Hundreds of ships are currently sailing under the protection of Selektope and according to current uptake, the future will see it become the go-to solution for keeping ship hulls barnacle free.