How a coating can cut carbon **and cost**

International Paint Ltd is part of AkzoNobel, one of the world's leading industrial companies and the largest global coatings manufacturer.

According to a leading shipping operator, "Coatings are an integral part of today's vessel operation, helping maximise ship performance and preserving assets".

Vessel fuel efficiency and environmental impact is an area where coatings have and will continue to have a significant role. With an estimated 350 million tonnes of fuel consumed annually by the world's fleet, there is an ever-increasing focus on shipping's environmental footprint. At this level of consumption the industry currently emits some 1.1 billion tonnes of CO_2 and over 10 million tonnes of SO_2 annually.

The industry has tried to find viable means of energy saving for decades. One way to do this is through the use of antifouling coatings. Antifouling coatings are used to improve the speed and energy efficiency of ships by preventing organisms such as barnacles and weed sticking to the underwater hull, restricting the ship's movement through the water.

If ships didn't use antifouling coatings, fuel consumption could be increased by as much as 40% – with current fuel use consequently rising by 140 million tonnes per year to a total of almost 500 million tonnes per year. It is estimated that antifouling coatings provide the shipping industry with annual fuel savings of $70 billion and reduced emissions of 450 million tonnes and 4.2 million tonnes respectively for CO_2 and SO_2 annually.

International Paint has supported the shipping industry with pioneering antifouling technology since the introduction of the first self polishing copolymer (SPC) antifouling in 1974. Since then, our contribution to the fuel and emissions efficiency of the global fleet has been hugely significant. In 1996 we introduced Intersleek®425, the first commercially available biocide free foul release technology for fast craft, and in 1999 introduced the revolutionary Intersleek®700 for deep sea, scheduled ships.

This "Seatrade" Awards winning and Queen's Awards winning, biocide free, silicone based technology works on a foul release basis by providing a very smooth, slippery, low friction surface onto which fouling organisms have difficulty attaching. Any which do attach, normally do so only weakly and can usually be easily removed. With proven average fuel savings of 4% and a corresponding reduction in emissions, Intersleek®700 has become firmly established as the industry benchmark in silicone foul release technology.

In 2007, we introduced the next generation of foul release technology, Intersleek®900. This is a new, unique patented biocide free fluoropolymer foul release coating. Fluoropolymer chemistry represents the very latest advances in foul release technology, significantly improving upon the performance of the best silicone based system, Intersleek®700.

Exceptionally smooth with unprecedented low levels of average hull roughness combined with excellent foul release capabilities and good resistance to mechanical damage means that, for the very first time, all vessels above 10 knots can now benefit from foul release technology, eg bulk carriers, tankers, general cargo vessels and feeder containers. Intersleek®900 also provides excellent performance on high speed/high activity scheduled ships. The low surface roughness, good coefficient of friction and advanced surface energy characteristics improves fuel efficiency and reduces slime build-up on container vessels, reefers, LNG/LPG carriers, cruise liners, ro-ros and vehicle carriers.

In terms of reduced CO_2 emissions and improved fuel efficiency, Intersleek®900 offers predicted savings of up to 9% in comparison to biocide containing SPC antifoulings. The potential exists for even greater savings in comparison to controlled depletion antifoulings.

A recent example on an aframax tanker, the *Prem Pride*, belonging to Mumbai-based Mercator Lines, proves the savings. "We had monitored the *Prem Pride's* fuel consumption closely," explains Mercator Lines' Mr Amit Agarwal, general manager. "At corresponding engine speeds, the vessel was consuming up to 6% less fuel, depending on weather conditions, after the application of Intersleek®900. We originally calculated projected savings based on a bunker price of $450 and found we were saving nearly three tonnes of fuel a day. And whilst bunker prices continue to climb, our payback period just gets shorter. The added advantages of no biocides, reduced drydocking times and lower CO_2 emissions convinced us that this is the technology we need."

The owner went on to apply the coating on a larger hull area on board the *Prem Divya* in June 2008. Amit Agarwal said: "We continued to closely monitor the performance of both vessels in service. Whilst we continue to be happy with the performance of Intersleek®900 on the *Prem Pride*, we fully expected an improvement on the *Prem Divya*, as we had increased the areas of the underwater hull coated to include the flat bottom. The detailed monitoring of the performance of the *Prem Divya* has confirmed that we are now achieving up to a 9% reduction in fuel consumption under comparable conditions." Fuel savings of this order add up to an environmental benefit equivalent to almost 11,000 tonnes less CO_2 emitted, 100 tonnes less SOx and 200 tonnes less NOx.

With an Intersleek®900 track record of over 300 ships, conservative estimates indicate that the technology is already delivering, in comparison to SPC antifoulings, reduced CO_2 emissions of almost 600,000 tonnes per year. If every ship in the world was coated with Intersleek Foul Release technology the potential exists for additional, annual CO_2 emission reductions of 90 million tonnes.

For more information, visit:
www.international-marine.com/intersleek900