

Coatings show their worth

Jim Brown of International Paint highlights some of the key issues relating to the environment and cost, in connection with in-service marine coatings.

Due to their relatively low cost, ease of application, and proven performance in service, marine coatings continue to represent excellent value for money and will remain the most economic solution for the protection of seagoing assets for a very long time to come.

Indeed, according to one leading tanker operator: 'Coatings are an integral part of today's vessel operation, helping maximise ship performance and preserving assets.'

While it could be argued that the single most important reason to paint a ship is to prevent corrosion, this would be ignoring the other key requirements for many operators of aesthetics and fouling control, both of which are important in terms of image, and fuel and emissions efficiency. Given the price of oil, fuel cost and fuel usage is of critical importance, while very high on the agenda for all operators today, of course, is the environment.

Fuel efficiency and environmental impact is an area where coatings have and will continue to have, a significant role. With an estimated 300 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 960 million tonnes of CO₂ and 9 million tonnes of SO₂ annually.

The International Maritime Organization estimates that without corrective action and the introduction of new technologies, air emissions, due to increased bunker fuel consumption by the world shipping fleet, could increase by between 38% and 72% by 2020.

One viable means of energy saving is through the application of antifouling coatings, which are used to improve the speed and energy efficiency of ships by preventing organisms such as barnacles and weed sticking to the underwater hull,



Following the successful refurbishment of the world's largest tanker, *TI Africa*, a sister vessel, *TI Oceania*, recently drydocked in Dubai. Both vessels are coated with the foul-release coating Intersleek 900. A third OSG vessel, *Overseas Rosalyn*, has also recently been coated with Intersleek 900.

restricting the ships' movement through the water.

If ships did not use antifouling coatings, fuel consumption could be increased by as much as 40% - with current fuel use consequently rising by 120 million tonnes per year to a total of 420 million tonnes per year. It is estimated that antifouling coatings provide the shipping industry with annual fuel savings of US\$60 billion and reduced emissions of 384 million tonnes and 3.6 million tonnes a year for CO₂ and SO₂ respectively.

International Paint has supported the shipping industry with antifouling technology since the introduction of the first self polishing copolymer (SPC) antifouling in 1974. Since then, in 1996 the company introduced Intersleek 425, the first commercially available biocide-free foul-release technology

for fast craft, and in 1999 introduced Intersleek 700 for deep sea, scheduled ships.

This 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 within the shipping industry.

In 2007, International Paint introduced the next generation of foul-release technology, Intersleek 900, a patented biocide-free fluoropolymer foul-release coating. Fluoropolymer chemistry represents the very latest advances in

foul-release technology, significantly improving upon the performance of Intersleek 700.

The characteristics of Intersleek 900 in terms of average hull toughness, foul-release capabilities, and resistance to mechanical damage, mean that for the very first time, all vessels operating above 10knots can benefit from foul-release technology, including bulk carriers, tankers, general cargo vessels, and feeder ships.

Intersleek 900 also provides excellent performance on high-speed/high-activity scheduled ships, such as container vessels, reefers, LNG/LPG carriers, cruiseships, ro-ro ships, and vehicle carriers.

In terms of reduced CO₂ emissions and improved fuel efficiency, Intersleek 900 offers predicted savings of 2% in comparison to Intersleek 700 and 6% in comparison to biocide containing SPC antifoulings, although in-service experience on a range of vessel types has shown savings considerably higher than this. The potential exists for even greater savings in comparison to controlled depletion antifoulings.

With a total foul-release track record of over 300 ships burning some 11 million tonnes of fuel per year, a conservative estimate indicates that Intersleek technology is already delivering, in comparison to SPC antifoulings, reduced CO₂ emissions of almost 2 million tonnes per year.

Other benefits of Intersleek 900 include reduced paint consumption at the next docking, reduced risk of fouling during loading delays, and enhanced corporate social responsibility through an improved environmental profile.

Raw material costs

While costs have clearly risen for shipyards and ship operators, paint manufacturers' own costs have also risen considerably. The BEAMA MCI (Marine Coatings Index) has risen by 12 basis points in the last 12 months and 43 basis points in the last 24 months. This increase has been predominantly caused by the increasing cost of hull coatings, specifically biocidal antifoulings. These products typically contain copper-based biocides to help prevent fouling growth and this key raw material has seen costs quadruple in recent times.

Between 2003 and 2006, when copper



In late 2007, International Paint completed a hull coating project on *Carnival Victory*. The cruise vessel was coated with Intersleek 900 during drydocking in the Grand Bahamas Shipyard. A sister ship, *Carnival Valor*, was coated with the same product earlier this year.

prices were increasing steadily, but sensibly, paint manufacturers carried out a series of antifouling price increases. A price spike in mid 2006 was impossible to manage effectively with price increases, however, and the cost of making antifouling paint rose suddenly and by a huge amount. A copper surcharge of US\$2.50 per litre was implemented in July 2006 for the biocidal antifouling product range. The intention, and result, was not to increase profits. The surcharge was simply a necessary mechanism to pass some of the extra cost of copper faced on to the end user. The reason a surcharge was used was that it could be implemented immediately and be effective across all sales in a uniform manner. Also, International believed it to be fairer to our customers than heavy price increasing, since if the copper price fell as was hoped, the coatings supplier could immediately remove the surcharge and customers could quickly return to their pre surcharge price level.

Unfortunately the drop in copper price observed in the last half of 2006 was only temporary and in 2007 copper prices continued their rise at the same average rate since 2003. Demand for copper is still strong, especially in China which has seen a 9% increase in demand during 2007, with a further 11% increase forecast for 2008. Despite China heavily invest-

ing in local copper mines, global supply is not increasing significantly and, due to strike action at various mines and ports in South America, demand is likely to remain high.

During 2007 International stopped surcharging and put the US\$2.50 onto the selling price. In February 2008, copper jumped to its highest price since May 2006. Future antifouling price rises remain a possibility if the current trend of rising copper costs continues.

Non-biocidal foul-release coatings, such as Intersleek 700 and Intersleek 900, do not contain copper and so remain unaffected by these price increases. Product groups which have suffered due to the rising cost of raw materials include epoxy-based coatings. In the last 12 months BEAMA reports that these products have increased in cost by 11 basis points and some analysts expect their rise to continue by a further 10% in 2008.

Finally, although aluminium prices decreased during 2007 due to lower demand within the US economy, strong demand in China is forecast for 2008, with analysts predicting a 22% increase. Continuing high energy costs will also help sustain the price in the coming months, and this will continue to impact heavily on coatings such as anti-corrosive primers. **SRC**