

Marine View

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Solutions in a changing world



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When we chose Solutions in a changing world as our topic for this issue, we could never have foreseen how profoundly appropriate that would be.

On top of the challenges our industry has been facing, such as low freight rates and high capacity, the pandemic has damaged economies and changed the nature of trade between countries in ways we have never seen before.

Yet still, the world depends on seaborne freight, and our industry can have an important role to play in the global recovery.

Never has it matter more for ship owners and ship builders to operate as cost-efficiently and sustainably as possible.

That's why this issue of Hempel Marine View focuses on the significance of the 2020 IMO regulations, and how hull coatings can bring efficiency no matter how you decide to respond to them. We also explore some of the industry's trends, such as the tendency to rely on hull cleaning as a default solution, when smart coatings can be an alternative.

I hope you find our insights thought-provoking and helpful.

Enjoy reading!

Hempel has gained valuable insight into hull cleaning issues through its involvement in a hull cleaning working group within BIMCO, the world's largest direct-membership organisation for shipowners, charterers, shipbrokers and agents.

The mathematics of hull cleaning

Assumption: USD 25,000 per standard cleaning

2-4 hull cleans every 5 years

Cleaning cost: USD 250,000 over 5 years

Hull efficiency. Quick fix thinking vs the power of fit-and-forget

Hull fouling and its effects on fuel efficiency have increasingly become central to the marine industry conversation. With fluctuating fuel prices, the IMO 2020 targets, the true effects of soft fouling like slime being recognised, and changing operational patterns (such as slow steaming and longer idle periods) now prevalent, the need to re-evaluate hull efficiency options has never been greater.

In this context, coating selection based on trading patterns and anticipated fouling has never been more important, because it helps to minimise operational expenses and the total cost of ownership (TCO). As a result, coating selection is increasingly an investment consideration, not just a capital expense.

Even so, some operators looking to minimise dry docking expenses without committing to hull performance investments are inadvertently increasing their operational cost by compromising on a more quick-fix solution – cleaning.

The risks of the hull cleaning habit

We recognise that hull cleaning may be a legitimate option when required by unexpected changes such as needing slow steam or idle in warm waters. However, it may be becoming a pattern for some operators, who are acting more on instinct than solid data. In fact, the boost in hull performance they are looking for would be better achieved by investing in a superior coating at the last drydocking.

Such a reactive approach may not be cost-effective or sustainable.

While cleaning has an immediate effect on removing fouling, some hull coating may also be removed or damaged, which reduces performance. Over time, this will have a cumulative impact on the smoothness of the hull, degrading the coating's effectiveness and longevity and accelerating polishing.

If cleaning is required, at Hempel, we would recommend water jetting to achieve the desired results. Abrasive solutions would not only increase the cost but at the next dry dock more surface blasting would be needed as the coating would be scraped off and damaged.

Cleaning and environmental questions

The IMO is rightly concerned about sustainability challenges too. Invasive species transfer is a risk if an inappropriate hull coating is used. For vessels experiencing frequent long idling times, the risk grows. And when a hull is brushed clean, what is removed is likely to enter the marine environment, a danger that even filtration or suction may not eliminate.

As a result, ports in Australia, New Zealand, California and many other parts of the world no longer permit fouled vessels to enter or hull cleaning to be done. In extreme conditions, this can mean vessels can find themselves stranded between ports.

In 2017, bulk carrier DL MARIGOLD found itself ejected from New Zealand waters because of biosecurity concerns about its hull, only to then be rejected by Fiji too, leaving the vessel in a maritime limbo.

Prevention not cure

At Hempel we strongly believe in prevention, not cure. The question of hull cleaning does not arise when a hull coating truly does its job and prevents fouling.

We design coatings to meet specific operational parameters and offer fouling protection throughout service lifetime, so that the downtime and harm of hull cleaning is avoided. An advanced system such as Hempaguard MaX, guarantees 1.2 per cent maximum speed loss over five years and new standards of idle time antifouling.

This is the fit-and-forget approach to hull performance optimisation, and the smart solution for optimum TCO.

Fuel and the hull coating business case

With operating costs and sustainability high on the agenda for the marine industry, one thing is certain: whatever fuel you use, you should use as little as possible. That means switching to a high-performance hull coating.

The IMO has stated that it wants the marine industry to reduce greenhouse gas emissions by at least 50 per cent by 2050. At the same time, vessel operators, customers and other industry stakeholders are pushing for more sustainable operations. This has placed fuel at the centre of industry discussions. The question everyone's asking is 'what will be the fuel of the future?'

The fuel dilemma

Currently, there are many different fuels pushing for recognition and eventual industry dominance, from ammonia and biofuels to LNG.

All have strengths and weaknesses. A number of operators have recently ordered new LNG-fuelled vessels for example, which operate with lower carbon dioxide and sulphur emissions than current vessels. But care is needed. Without dedicated engine systems, burning LNG fuel can lead to the release of methane – so called 'methane slip' – a greenhouse gas even more damaging to the environment than carbon dioxide. As a result, if many more vessels switch to LNG, the IMO may need to consider new rules to limit methane emissions in the face of growing concerns that the IMO targets can't reasonably be met.

For vessel operators, this presents a significant dilemma: which fuel to use and when to stake their bets. The entire decision is one of uncertainty, a balance between conversion costs and future availability, fuel prices and environmental impact – all of which are relatively unknown. The only certainty when it comes to fuel use is that less is more.

Responsible resource use

It doesn't matter what type of fuel a vessel uses. At the end of the day, to achieve the lowest costs and greatest sustainability, vessels should use as little fuel as possible. All fuels cost money and even extremely low-emission fuels, such as ammonia and hydrogen, incur a 'carbon cost' during production. Reducing fuel consumption not only lowers costs, but also reduces carbon emissions – both 'upstream' during production and at the 'stack' on the vessel.

There is a way to achieve this. A high-performance hull coating will reduce fuel consumption, regardless of the fuel type you choose. This will reduce both your fuel costs and your environmental impact, whether that impact occurs upstream or at the stack.

Only one thing is certain. To achieve the lowest costs and greatest sustainability, your vessels should use as little fuel as possible – which is where hull coatings come in.





How a high-performance hull coating can improve the business case for any fuel

As the business case for any fuel type relies on cost, the proven fuel-saving capability of high-performance hull coatings makes robust commercial sense.

Based on Actiguard technology, Hempel's Hempaguard hull coatings are widely proven over many years to deliver a fast return on investment. No matter what happens to fuel prices or what fuel is used, a market-leading hull coating system such as Hempel's Hempaguard X7 or MaX will reduce fuel consumption and associated costs and emissions.

When choosing a hull coating, speed loss reduction is key. Consider a VLCC. The average speed loss using a market average antifouling hull coating is 5.9 per cent over five years. In comparison, Hempaguard X7 has been documented (using the ISO

19030 method) to deliver a maximum speed loss of 1.4 per cent over five years. This corresponds to a fuel saving of 13.5 per cent compared to the market average antifouling hull coating. Even when using low-cost fuels, Hempaguard X7 could deliver an annual saving in the region of USD 1.3 million and a return on investment in under five months.

It's worth noting that this is significantly faster than other currently available technologies, including Flettner rotors, as the Green Ship of the Future project found out. The project assessed what can be done right now with existing technologies to reduce fuel consumption by 'retrofitting' the current aging fleet. Direct comparisons showed that Hempaguard coatings provide as good as or higher savings than even Flettner rotors, but are far cheaper to install. As a result, Hempaguard coatings will deliver a return on investment within the first year, compared to around ten years for a Flettner rotor.

Annual saving USD 1.3 million

ROI under 5 months

13.5% fuel saving

Chart 1. Hempaguard X7: How differing fuel prices would affect ROI on a VLCC

	Scenario 1: Base case	Scenario 2:	Scenario 3:
Hempaguard X7 application cost	\$500,000	\$500,000	\$500,000
Fuel cost per ton	\$350	\$575	\$440
Cost difference (to base case)	\$0 (0%)	\$225	\$90
Saving (compared to market average antifouling)	19.5%	19.5%	19.5%
Cost saving (lifecycle/interval of 5 years)	\$6,979,900	\$11,467,000	\$8,774,800
Annual saving	\$1,396,000	\$2,293,400	\$1,755,000
ROI	4.3 months	2.6 months	3.4 months

Example vessel: VLCC. Assumptions; daily vessel fuel consumption 80 tonnes, annual activity level 70 per cent.

Appealing to investors and customers

When it comes to fuel choice, the selection of a high-performance hull coating is the only investment clearly shown to reduce both emissions and costs, whatever fuel is chosen. This makes it both a commercially and environmentally responsible choice.

A high-performance hull coating will lower costs for vessel operators and will make a vessel more attractive to charterers, who are naturally drawn to vessels that operate on lower cost fuel. It will also appeal to investors and customers, who are increasingly strident in their demand for demonstrated lower environmental impact. It is the only certainty in an uncertain landscape.

As a world-leading supplier of trusted coating solutions, Hempel is a global company with strong values, working with customers in the protective, marine, decorative, container and yacht industries. Hempel factories, R&D centres and stock points are established in every region.

Across the globe, Hempel's coatings protect surfaces, structures and equipment. They extend asset lifetimes, reduce maintenance costs and make homes and workplaces safer and more colourful. Hempel was founded in Copenhagen, Denmark in 1915. It is proudly owned by the Hempel Foundation, which ensures a solid economic base for the Hempel Group and supports cultural, social, humanitarian and scientific purposes around the world.

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