

Improving CII & EEXI

Decarbonisation with low lifecycle cost and fast ROI

The business case
for high-performance
hull coatings

**Paint
your way**



Hull coating

One of the most attractive energy efficiency technologies

Hull coating is often considered an anti-fouling measure only. But in a world focused on decarbonisation and energy optimisation, hull coating has much more to offer.

It is one of single most efficient ways to improve the energy efficiency of a vessel – and one of the simplest and fastest ways to maintain a good CII rating for years as well as increase the reference speed for the purpose of EEXI.

In this Hempel Marine Energy Efficiency Fact Sheet we will demonstrate how.

Included is a vessel-specific case analysis of how a hull coating upgrade led to annual savings of more than \$ 500,000 within a payback period of only 9 months.

Contents

p.3

The benefits of high-performance hull coating

p.5

The impact of hull coating on CII and EEXI

p.7

The business case for high-performance hull coatings from a TCO and ROI perspective

The benefits of high-performance hull coating

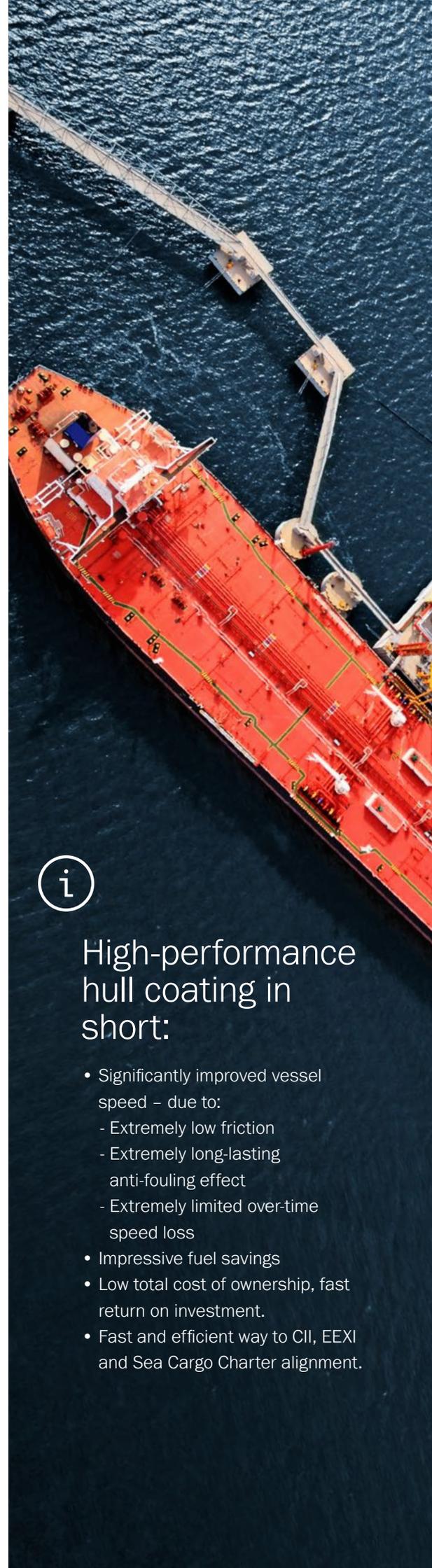
High performance hull coating is an energy efficient way to improve the hydrodynamics of the vessel, i.e. use less power to maintain same speed.

Through its low friction effect a high-performance hull coating helps your vessels 'glide' through the water. It results in lower fuel consumption for years compared to standard coatings regardless of sailing or seawater conditions.

The secret is an exceptional low hull roughness and a very long-lasting antifouling effect. Even if your vessel undergoes extensive idle periods, changes trading patterns or steams slowly.

It makes high-performance hull coating one of the absolute top-tier energy efficiency technologies available – and a unique opportunity to create competitive advantages for both shipowners and operators.

By combining high-performance hull coating with other energy efficiency technologies – like for instance rudder, propeller, or duct refinements – you will be able to improve CII and EEXI even further.



High-performance hull coating in short:

- Significantly improved vessel speed – due to:
 - Extremely low friction
 - Extremely long-lasting anti-fouling effect
 - Extremely limited over-time speed loss
- Impressive fuel savings
- Low total cost of ownership, fast return on investment.
- Fast and efficient way to CII, EEXI and Sea Cargo Charter alignment.

Want to **know more** about the benefits of high-performance hull coating?

Do you want more facts and information about hull coating as an energy efficiency technology? Or about the combined effect of hull coating and other top-tier measures? Please don't hesitate to contact us.

Contact >>



The Hempaguard range of high-performance hull coating solutions

The Hempaguard range of hull coatings offers you one of the most high-performing hull coating solutions available on the market. With its unique silicone-hydrogel Actiguard technology, you will be able to obtain speed improvements leading to fuel savings of up to 20 per cent over the entire 5-year period until next mandatory docking – compared to an ordinary antifouling solution – and a very low average speed loss down to 1.2 per cent. No matter where and how your vessel travels. It's a mature off-the-shelf technology with documented efficiency gains and 3,000 applications since 2013 – and a retention rate of 95 per cent.

Read more about the Hempaguard range here >>



The impact of Hempaguard on CII and EEXI

High-performance hull coating is a major step towards CII, EEXI and the Sea Cargo Charter

EEXI

Due to the immediate out-of-dock power gain coming from the extreme smoothness after the application of the Hempaguard hull coating, you can compensate for the Engine Power Limitation (EPL) taken to reach the required EEXI – resulting in a 2-3% increase in the vessel’s reference speed (V_{ref}).



Immediate out-of-dock speed increase

CII

The immediate out-of-dock power gain resulting from the coating, as well as the minimised over-the-years speed-loss until next dry-docking, will make you reach up to 20 per cent CII improvement compared to average antifouling coatings – and 7-10 per cent improvement compared to top-tier coatings when applying the Hempaguard X7 high-performance silicone solution.



Fuel savings compared to average antifouling coatings

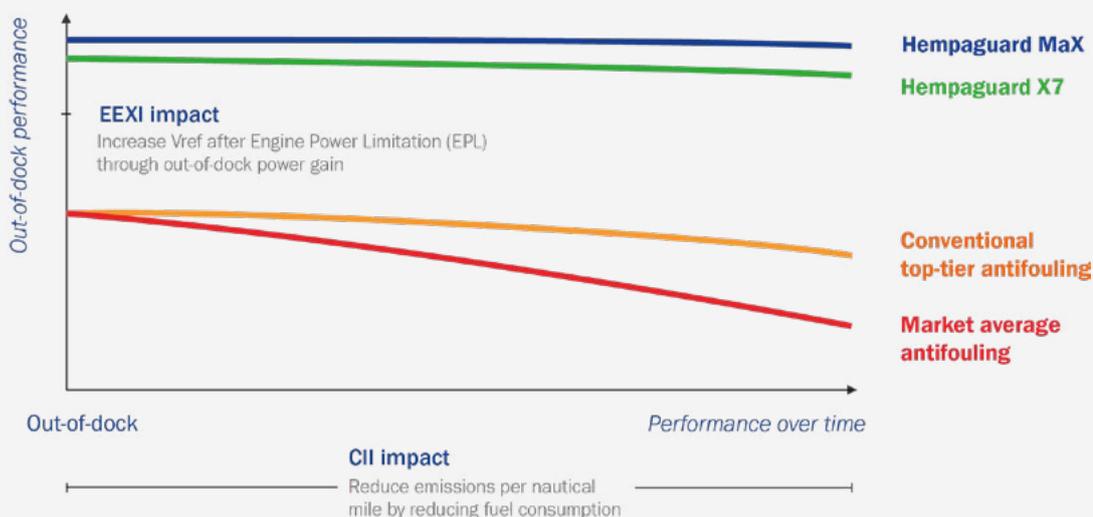


Fuel savings compared to top-tier antifouling coatings

Sea Cargo Charter

As a ship owner the fuel savings resulting from the high-performance hull coating, both right out of dock and in the years to come, will help your customers with their own efforts to decarbonise. It will therefore ease your charterers alignment with the Sea Cargo Charter and generally make your vessels more competitive and attractive.

High-performance hull coating compared to other coating solutions



High-performance hull coating compared to conventional top-tier and market average solutions

	Quantifiable on project basis			
	Out-of-dock power gain	Speed loss over time	EEXI-improvement one time	CII improvement 5 year avg
Hempaguard MaX	8%*	1,2%**	2,7% speed increase vs any NB antifouling	22% vs mrk avg 9-12% vs top tier
Hempaguard X7	6%*	1,4%**	2% speed increase vs any NB antifouling	20% vs mrk avg 7-10% vs top tier
Conventional top-tier antifouling	0%	1,5-2,5%	No impact	10-13% vs mrk avg
Market average antifouling	0%	5,9%	No impact	-

* Proved based on frictional studies, towing tank tests and model large scale tests run by independent partners. Confirmed by actual data from ships in service using performance monitoring equipment.

** Full hull application. 1 per cent speed loss requires 3 per cent power increase to maintain speed

Want to know more?

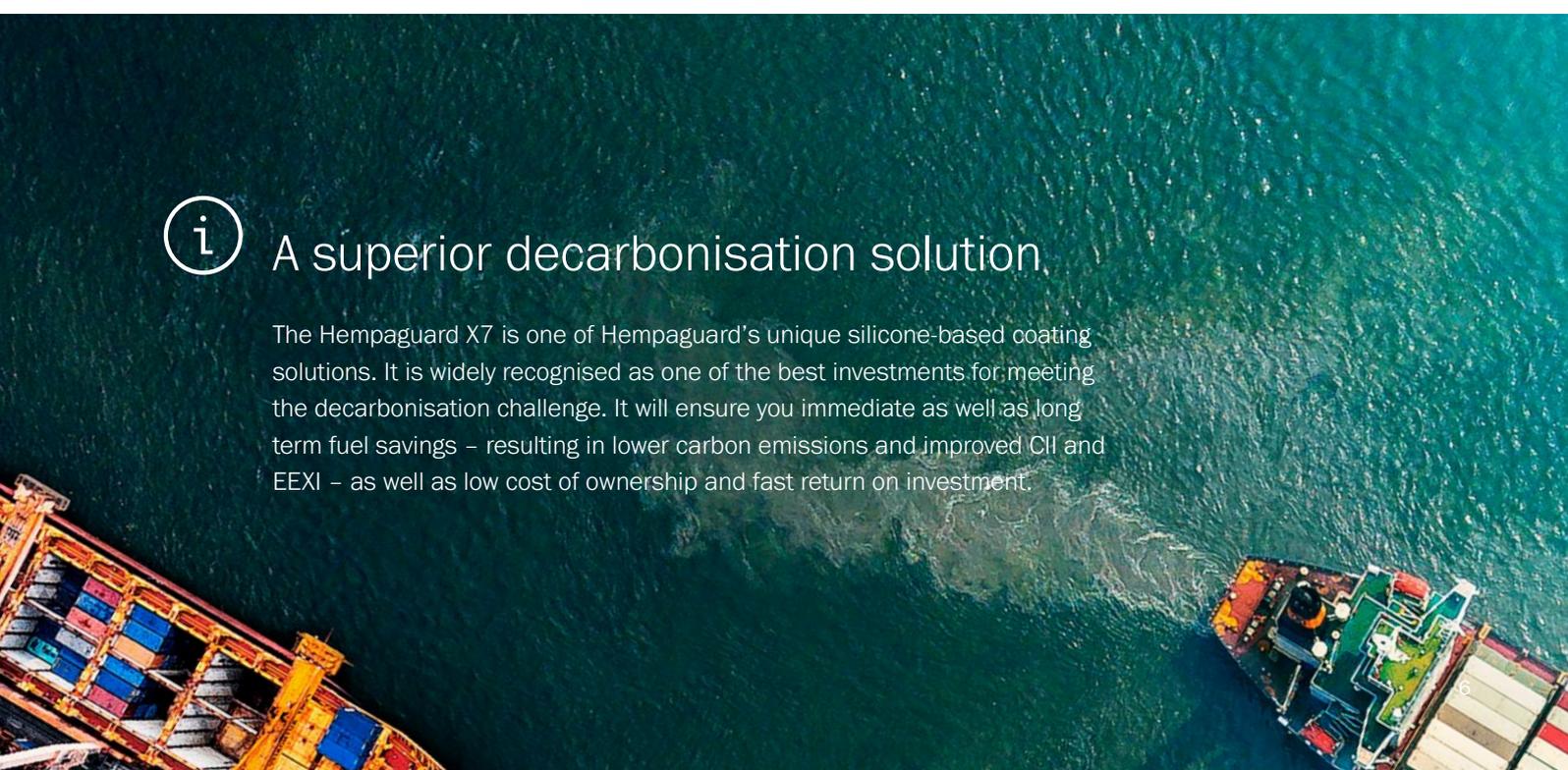
Want to know more about how to reach CII and EEXI through high-performance hull coating? Contact one of our experts.

Contact >>



A superior decarbonisation solution

The Hempaguard X7 is one of Hempaguard's unique silicone-based coating solutions. It is widely recognised as one of the best investments for meeting the decarbonisation challenge. It will ensure you immediate as well as long term fuel savings – resulting in lower carbon emissions and improved CII and EEXI – as well as low cost of ownership and fast return on investment.



The business case for high-performance hull coatings from a TCO and ROI perspective

The basis for this analysis is a Panamax tanker built in 2017, originally standard painted with the Hempel Globic 8000.

All direct costs as well as costs from not being able to hire the vessel while being painted are included.

It is compared to the effect of a Hempaguard X7 silicone-based high-performance upgrade on the flat and the vertical bottom and a Globic 9500 on the boot top.

The effect of the upgrade is an annual operation savings of more than half a million dollars and a return on the initial investment in less than 9 months.

Total cost of ownership and return of investment overview

See next page for details

	Elements of Cost	Hempaguard X7 / Globic 9500	Globic 8000	Hempaguard X7 / Globic 9500 vs. Globic 8000
Paint	Paint Purchasing cost	\$435,000	\$142,000	\$293,000
Repair Yard	Surface preparation cost	\$44,000	\$16,000	\$28,000
	Washing Cost	\$5,000	\$5,000	\$0
	Paint Application	\$57,000	\$8,000	\$49,000
	Repair Yard Rent	\$30,000	\$30,000	\$0
	Off hire cost	\$73,000	\$73,000	\$0
Cleanings	Diver cost	\$0	\$18,000	-\$18,000
	Extra cost for next DD	\$0	\$13,000	-\$13,000
	Additional fuel consumption (LSFO)	\$0	\$94,000	-\$94,000
	Off hire cost	\$0	\$24,000	-\$24,000
Fuel	Fuel Cost (LSFO) 5 Years	\$16,298,000	\$18,820,000	-\$2,522,000
	CO2 emission Tons (LSFO) 5 Years	68,000	78,000	-10,000
TCO	Total Cost of Ownership (LSFO) 5 Years	\$16,942,000	\$19,243,000	-\$2,301,000
Savings over 5 years (LSFO)				\$2,301,000
Savings Annually (LSFO)				\$460,200
Speed increase for the purpose of EEXI				3.9% out of dock savings 1.3% speed increase
CII ratings (CII reference 5.6)				Maintain rating C for 3 years
Payback Period in Months				9
Increase in earnings per day (TCE)				\$2,500

Details of TCO analysis explained

Paint

Includes all costs associated with the purchase from the paint supplier.

Repair Yard

Includes all costs related to a full sandblasting of the hull, washing, painting and dry dock renting. As well as the costs associated with not being able to hire the ship.

Cleaning

The standard coated vessel needs to be inspected and cleaned a number of times (on average 3-5) during the vessel's service life.

The cleaning is done while the ship is in the water.

The cleaning leads to a partial removal of the existing antifouling paint, thus it can shorten its lifetime due to decreased DFT (Dry Film Thickness) and consequence on fouling accumulation.

Fuel cost assumption

Fuel costs are based on the costs of standard low sulfur fuel oils, LSFO. Fuel consumption is set to 25 tons per day, speed to 13 knots and the commercial activity to an average of 55% during the 5-year period. Fuel costs is set to 750 USD per ton of LSFO.

Total cost of ownership (TCO)

The difference in total costs for the 5-year period until next mandatory dry docking makes the Hempaguard X7 high-performance solution more than 2.3 million dollars less expensive than the standard coating.

Return on investment (ROI)

With an annual savings of more than 530,000 dollars the initial expenditure connected with the high-performance solution pays back in just about 9 months.



Get a vessel-specific impact assessment of a hull coating upgrade on your vessels

We hope you have found this introduction to the energy efficiency of high-performance hull coating useful.

Please don't hesitate to ask for a vessel-specific assessment of hull coating on your specific ships and fleet.

Through our combined TCO/ROI and CII/EEXI impact analysis we will be happy to help you make a well-informed decision on the hull coating upgrade investment.

Our vessel-specific assessment will thus provide you with:

Quantified impact of the coating upgrade on:

- Reduced fuel consumption reflected in less CO₂ emissions directly influencing CII rating
- Change of reference speed (Vref) for the purpose of EEXI
- EEOI improvement for the purpose of Sea Cargo Charter alignment

Full visibility for both owners and operators by quantifying the costs and economic benefits through:

- Total Cost of Ownership (TCO) for service life for different paint system scenarios
- Return on investment (ROI) in months
- Earnings ability boost (TCE)

[Book a meeting >>](#)



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