SUBSEA

PROTECTION AND PERFORMANCE

Magazine

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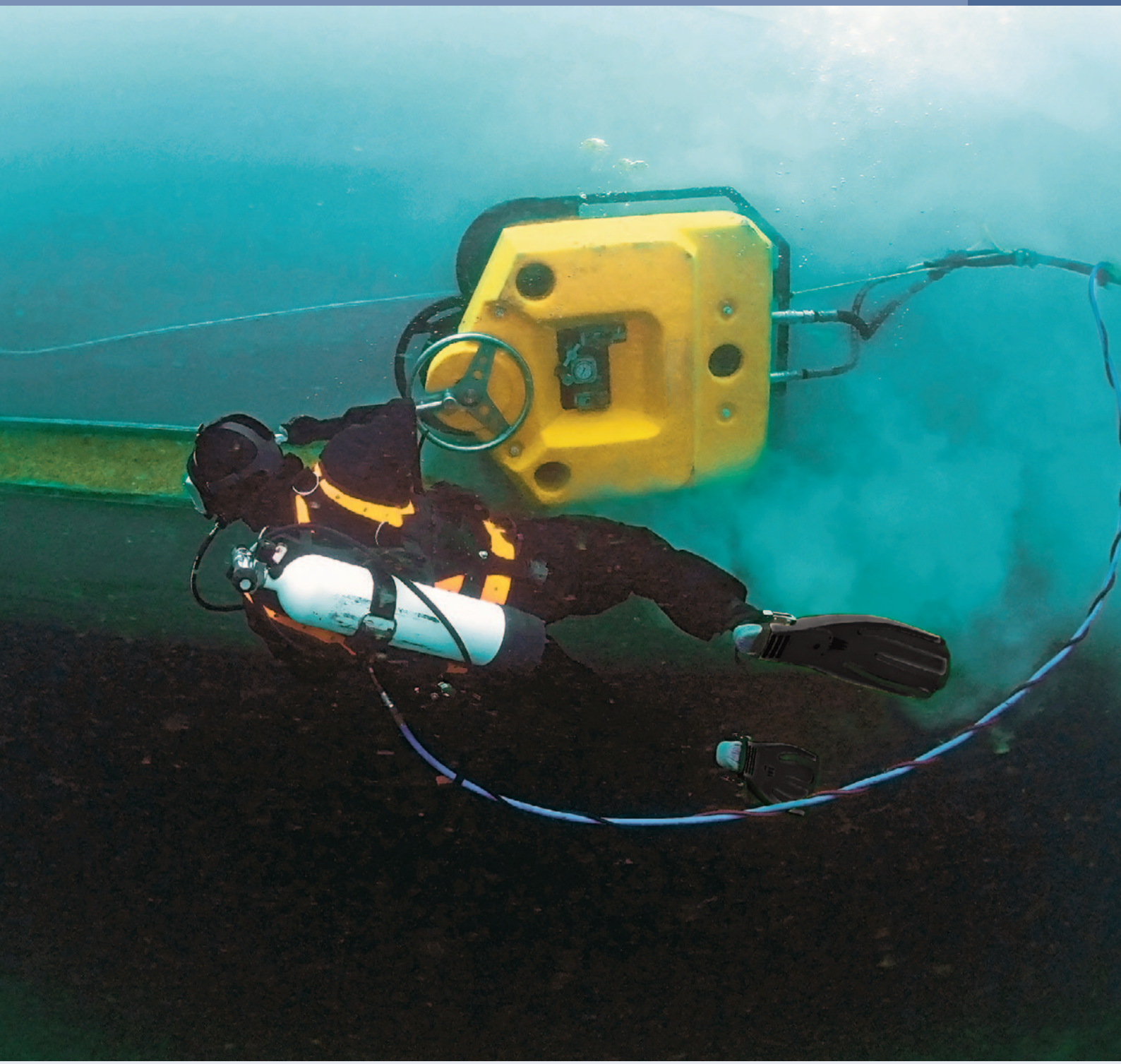

ECOLOCK® ultra long-lasting protection for offshore hulls

Ecolock is designed to protect offshore vessels for decades without the need for drydocking. Increasingly, offshore units such as FPSOs, FSOs, FLRSUs and others used for offshore oil and gas exploration, drilling, storage and transport need to stay out of drydock for 15, 25 even 40 years.

The challenge has been to protect the underwater hull from corrosion and to provide a cleanable surface so that the biofouling that accumulates can be removed successfully and safely for UWILD and to reduce weight. Ecolock is the answer to that challenge.

Ecolock is an extremely tough and durable coating designed to remain in excellent condition for 15 - 25 years without drydocking, repair or replacement. Ecolock can be cleaned underwater as often as needed to meet the UWILD and weight requirements of FPSOs, drill ships and other offshore vessels. Ecolock is the result of continual R&D on offshore hull coatings since the 1990s.

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ECOLOCK®
LIFETIME CORROSION PROTECTION

Editorial

For a number of reasons, these times are quite unpredictable for the shipping industry. Ship owners are increasingly confronted with the necessity to lay vessels up for extended periods. While this measure helps weather economic storms, it comes with the inevitable concern of maintaining the integrity of the ship's underwater hull. Traditional coatings typically suffer severe damage during fouling removal after prolonged inactivity. However, with Ecospeed, this is not the case.

Ecospeed is specifically engineered to address the demands posed by prolonged lay-ups. Its impermeable composition provides unmatched anticorrosive protection, safeguarding the vessel's hull from damage from any type of marine fouling, even during lengthy idle periods. Shipowners no longer need to worry about rust or structural damage to their vessels' hulls after cleaning.

The proof is evident in real-world scenarios, such as a cruise ship anchored stationary in the Caribbean waters for over seven months. Upon resuming operations, Ecospeed made it possible to completely remove extensive fouling through underwater cleaning, leaving the underlying coating unharmed. This capability not only simplifies maintenance but significantly reduces operational downtime and costs.

Additionally, Ecospeed's exceptional properties ensure the coating actually improves with each cleaning, as you can read in the second article in this magazine. Repeated cleanings enhance rather than degrade the coating's surface characteristics. This unique advantage means that vessels can swiftly return to optimal operating condition, without the financial burden typically associated with recoating and repairs after prolonged lay-ups.

With Ecospeed, extended lay-ups no longer equate to added stress or cost. Instead, shipowners gain peace of mind and confidence, knowing their vessels can quickly and affordably return to service whenever needed.

Take proactive control of your fleet's hull protection today—choose Ecospeed and experience firsthand the difference of truly resilient hull care.

Ecospeed allows for complete removal of extensive fouling through underwater cleaning after extended layup periods with the coating always intact.

Subsea Industries NV
Boud Van Rompay
Founder

Proven protection against cavitation damage

Cavitation erosion and corrosion remain persistent challenges in marine operations, often causing severe damage to rudders, thruster tunnels, and other underwater components. This leads to frequent drydockings, costly repairs, and operational downtime. However, our glassflake-reinforced protective coating Ecoshield, has emerged as a trusted solution. Through real-world case studies, shipowners have demonstrated that Ecoshield not only halts erosion but dramatically reduces long-term maintenance costs.

Understanding the challenge

Cavitation is the formation and collapse of vapor bubbles caused by changes in water pressure near metal surfaces. The forceful collapse of these bubbles eats away at exposed steel, especially around rudders and thruster tunnels, leading to rapid deterioration. Traditional coatings often fail to withstand such stress, eroding within months and requiring frequent reapplication.

Corrosion and cavitation damage can have a devastation effect on rudders if they are not given the proper protection.

After grit blasting, the rudder is ready for Ecoshield application.

Ecoshield was engineered to withstand these aggressive forces. Applied in two layers, the coating forms a hard, durable shield that adheres tightly to steel. Unlike conventional paints, it does not need to be reapplied at every drydocking. Instead, minor touch-ups suffice even after many years of service. These touch-ups blend in perfectly with the existing coating.

Ecoshield can be applied prior to installation of the rudder gear.

Thruster tunnel after the first Ecoshield layer was applied.

Case study snapshots

Ernst Russ fleet

In 2004, German shipowner Ernst Russ faced persistent cavitation damage on the rudder of their container vessel *Elizabeth Russ*. After applying Ecoshield, they observed that the damage stopped completely. The success led to Ecoshield being applied across the company's fleet.

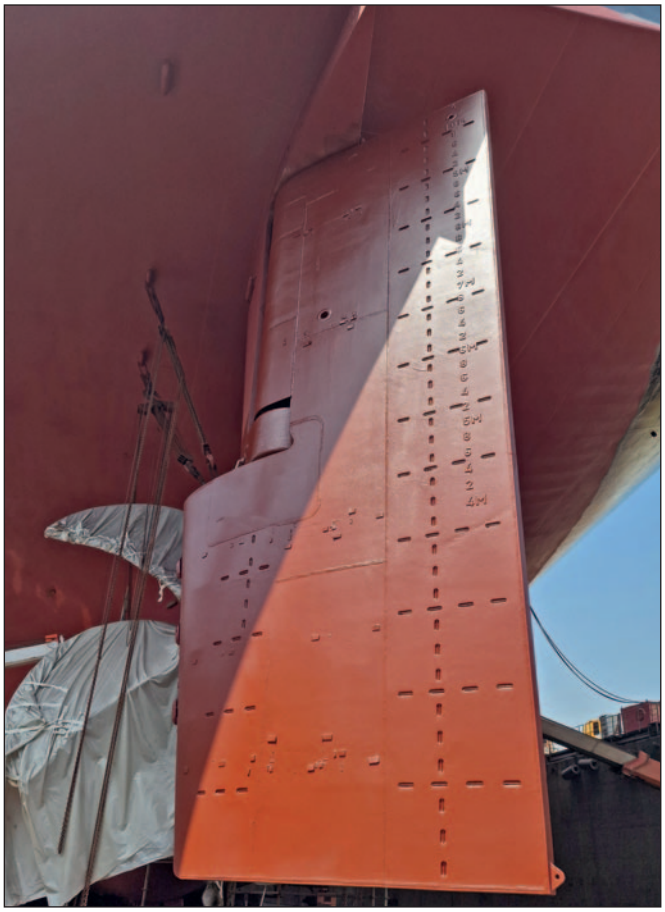
Mediterranean Shipping Company (MSC)

With a massive container ship fleet, MSC required a durable solution to reduce maintenance. After initial positive results, Ecoshield has been adopted for over 100 of their vessels so far, applied not only to rudders but also to thruster tunnels, bulbous bows, and even boottops. This upgrade to MSC's container fleet is continuing. The consistent perform-

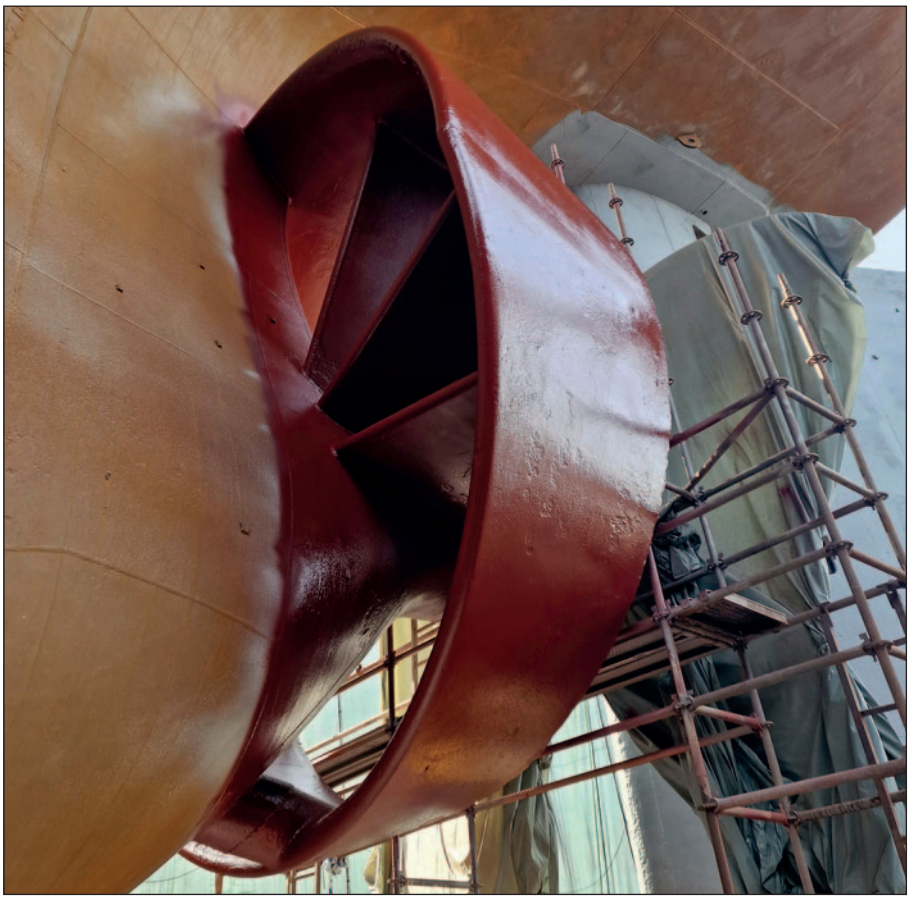
The second layer can be applied as soon as three hours after the first.

Thruster protected with Ecoshield for many years to come.

No anodes are required on rudders coated with Ecoshield.



No repaint will be needed during future drydockings.



All areas prone to cavitation and corrosion damage should be protected with Ecoshield.

ance across a variety of surfaces cemented its place as a core element of their protective maintenance strategy.

CMA CGM
Major French shipping line CMA CGM first applied Ecoshield to protect the rudder of one of their container ships in January 2011. Since then, they have continued to use Ecoshield on the rudders, Becker Twisted Fins®, thruster tunnels, and bulbous bows of more than 100 ships.

Seaspan
Canadian shipowner Seaspan discovered the value of Ecoshield in 2010. Since then, they have experienced great success using the coating to protect the running gear of over 100 ships under their management, including many newbuilds. Notably, rudders coated with Ecoshield required no repairs even after 9–10 years, saving up to three days in drydock per ship.

Danaos Shipping
One of the world's largest independent container charter ship owners, Danaos Shipping, began using Ecoshield for their rudders in 2008. About 40 successful applications later, they have extended the use of Ecoshield to thruster tunnels and other parts of their ships.

Efficient application with long-term payoff

Ecoshield is designed with operational flexibility in mind. The application involves grit blasting the steel surface and then applying two coats of Ecoshield. These coats can be applied in quick succession—just three hours apart—making it possible to complete the process within a single day during scheduled drydockings.

Ecofix, a steel-repair filler compatible with Ecoshield, is used to rebuild the substrate where cavitation has already taken its toll. This avoids the need for hot work and complex steel replacement procedures. Once applied, the Ecoshield coating seals the surface for long-term protection.

Real-world savings

Operators report significant cost reductions thanks to reduced drydock time and minimal reapplication needs. The estimated savings per ship are substantial—not just in coating costs but also in lost time, labor, and operational disruption.

Moreover, the use of Ecoshield eliminates the need for sacrificial anodes on rudders, reducing complexity and weight while delivering consistent protection.

Conclusion: A future-proof investment

Shipowners worldwide are turning to Ecoshield as a proactive measure against cavitation and corrosion damage. With proven performance across over 1,000 applications, the coating is more than a short-term fix—it's a long-term investment in vessel integrity, efficiency, and cost savings.

To learn more about how Ecoshield can protect your fleet and reduce drydock costs, visit Subsea Industries' website at www.subind.net. Explore the full list of case studies under the "Case Studies" section for Ecoshield.

Protect your vessels. Preserve performance. Huge cost savings. Choose Ecoshield. ■

Advantages of a cleanable hull coating

(This is Part 1 of a 2-part article on the subject of ship hull cleaning for maximum fuel efficiency.)

Properly implemented, efficient hull cleaning on the right type of underwater ship hull coating is the answer to optimum fuel efficiency, long term hull protection and the elimination of the hull-borne invasive aquatic species problem.

Because of the types of hull coatings in general use on the world fleet, the subject of hull cleaning has become somewhat controversial. Most of these coatings are not suitable for in-water cleaning. In this article we examine how the Ecospeed hull coating and cleaning system cuts through this controversy and delivers excellent ship hull performance with the advantages of significant fuel savings and benefit to the marine environment.

Wooden sailing ship careened (laid on its side) for hull cleaning.

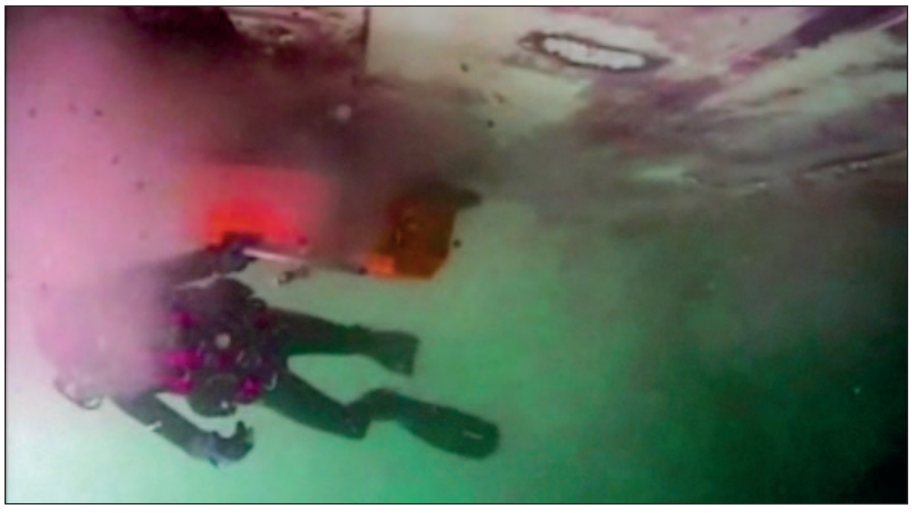
Historical perspective

Ship hull cleaning for performance is not a new subject.

The Greek author Plutarch (45–125 AD) discusses the benefits of clean ship hulls in his *Symposiacs* written around 100 AD.

"...for the ship continuing dry, not yet made heavy by the moisture soaking into the wood, it is probable that it lightly glides, and as long as it is clean, easily cuts the waves; but when it is thoroughly soaked, when weeds, ooze, and filth stick upon its sides, the stroke of the ship is more obtuse and weak; and the water, coming upon this clammy matter, doth not so easily part from it; and this is the reason why they usually calk their ships."

More recently, in 1770, Captain James Cook on his trip around the world notes in his journal that he was looking for a suitable location to careen (beach and lay on its side) the *Endeavour* with the sole purpose of cleaning the ship's bottom.



Trying to clean a hull with an antifouling coating harms the coating and the marine environment.

Cruise ship hull after 5 years of sailing with a traditional antifouling coating scheme.

Cleaning a cruise ship hull protected with Ecospeed is a simple task.

Ecospeed on a cruise ship hull after cleaning.

Later, ship hulls were cleaned by divers using hand and mechanical tools with the ship still in the water. This avoided beaching and careening or the more modern equivalent, drydocking.

Highly toxic TBT in hull paints gave the illusion that ship hull cleaning was an unnecessary thing of the past. It was soon discovered that TBT's damage to the marine environment was extensive, severe and unsustainable. Nevertheless, during the "TBT era" the subject and practice of underwater ship hull cleaning went into decline in terms of repute, technology, skill and general availability.

Vicious circle

However, the antifouling technology which replaced TBT-laden hull paint was relatively ineffective. All ship hulls develop a biofilm or slime layer at the very least, regardless of the bottom paint used, and this, combined with rough hull coatings which degrade over time, carries with it a fuel penalty of as much as 20% or more. These coatings could not be cleaned without damage to the paint and to the marine environment.

The hull coating industry has created a "damned if you do, damned if you don't" situation for shipowners/operators which includes frequent drydocking and paint replacement, a built-in fuel penalty, and coatings which are ineffective in preventing fouling yet are not suitable for underwater cleaning (the only practical means of avoiding the fuel penalty incurred).

Today underwater ship hull cleaning thoroughly and efficiently done on an industrial basis and on a suitable hull coating is the answer to reduc-

Regularly pressure washing the Ecospeed-coated hull of a water taxi in Rotterdam ensures top fuel performance.

Cleaning the hull of an FSRU coated with Ecolock for a UWILD inspection is easy to do without harm to coating or environment.

ing fuel costs, cutting GHG emissions, preventing the spread of non-indigenous species while avoiding marine chemical pollution.

Ecospeed was invented to overcome these problems

There are two main liabilities of cleaning conventional AF and FR coatings:

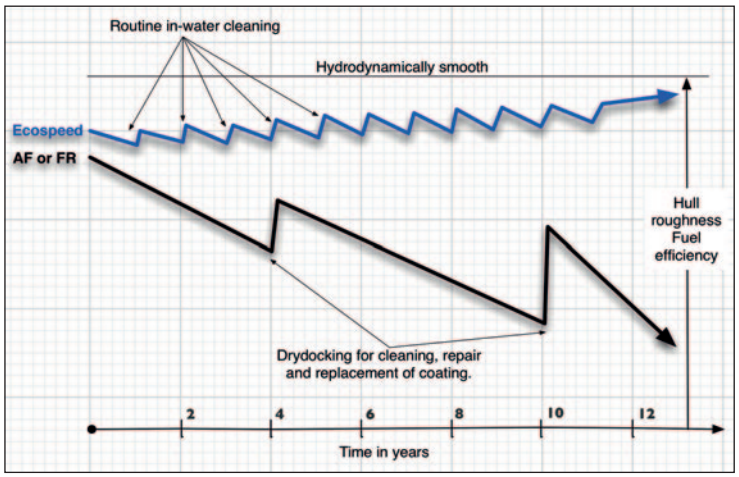
1. Damage to the coating from the cleaning
2. Harm to the local environment.

The coatings in general use are not very tough and they are porous enough for barnacle glue to penetrate the coating scheme, all the way down to the steel. Because they are relatively soft, when one attempts to clean them, the coating is damaged by brushing even if only weed and slime are removed. This reduces the effective life of the coating and more fouling accumulates which then needs to be cleaned off – a dwindling spiral. Underwater high-pressure jets are not effective since they have to overcome the resistance of the water and have a strong repelling force against the hull.

At the same time, cleaning coatings that are laden with heavy metals, biocides, silicone oils, PFAS, and microplastics, results in a pulse discharge of these toxic substances into the water column and the sediment. There they remain until stirred up and resuspended.

Ecospeed, on the other hand, is a hard coating which can be cleaned regularly without losing any thickness and without any toxic substances being released into the water. It can also be high-pressure washed in drydock, but when cleaned underwater with the right tools, the result is a slight buffing effect which im-

Heavy fouling can be removed repeatedly from an Ecospeed coated hull, without damage to the coating.



Comparison of long-term fuel efficiency of Ecospeed and a traditional AF or FR coating. Ecospeed becomes more fuel efficient over a 10-year period. The AF or FR coating degrades and eventually needs to be fully replace.

proves the hydrodynamic properties of the coating over time. This coating does not need to be replaced. Any mechanical damage can easily be repaired, leaving the surface as good as when the paint was first applied, just slightly smoother. So, ten years down the line, you still have a well-protected hull with the original coating intact and the bonus of better fuel efficiency than when new.

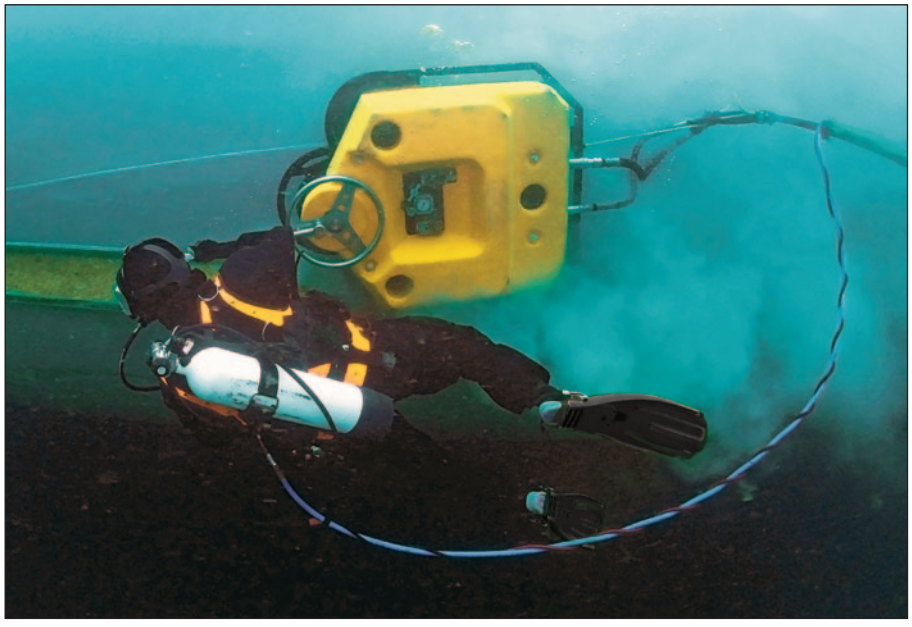
Case in point

One cruise line took the plunge and opted for the Ecospeed coating and cleaning system for four of their ships. They blasted off the traditional antifouling scheme on two ships, applied Ecospeed, cleaned regularly when the hull accumulated slime and light weed and measured the results.

The President of the cruise line was interviewed in Maritime Executive magazine and quoted as saying of the coating: “About five years ago, in an industry first, the [name of ship] had the same [Ecospeed] product applied to its hull and its fuel consumption was reduced by ten percent. The environmentally friendly coating achieves its fuel savings by reducing hull resistance in the water.”

The company went on to use the same system on two newbuild cruise ships with even better results.

There were other advantages of Ecospeed for the cruise line. The officers and crew nicknamed it the “wash and go coating” because when they drydocked, all they had to do was high pressure wash the hull, perhaps carry out minor paint touch-ups and the ship would be ready to sail. No more lengthy stays in drydock for repainting.



Cleaning the hull of a cruise ship coated with Ecospeed to ensure maximum fuel efficiency.

Conclusion

Ship hull cleaning has a long history with very mixed results. When the right type of coating is used, it is the answer to high fuel efficiency without any harm to the marine environment.

In a follow-up article we will cover the practical aspects of the coating system, when to clean, how to clean and other technical details. ■

ECOSPEED®
SHIP HULL PERFORMANCE TECHNOLOGY

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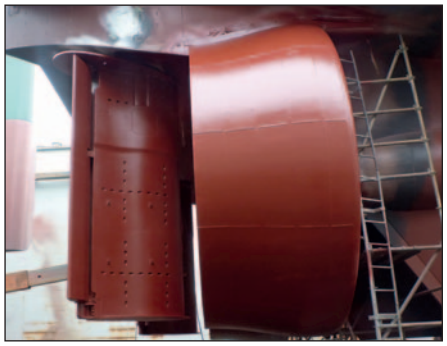

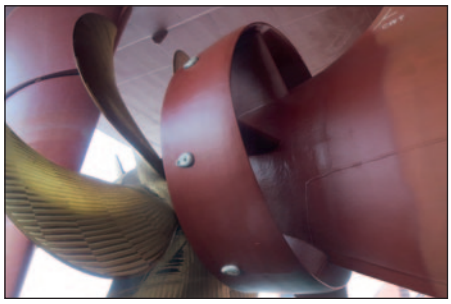

Subsea Industries NV, was founded in 1983 specifically to take care of the design, development and marketing of what has become an evolving line of underwater hull and propeller cleaning equipment as well as the line of hard hull coating systems.

All products produced by Subsea Industries have the same goal in mind: To keep the underwater part of your vessel in the best possible condition for its entire lifetime at the best possible performance.

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