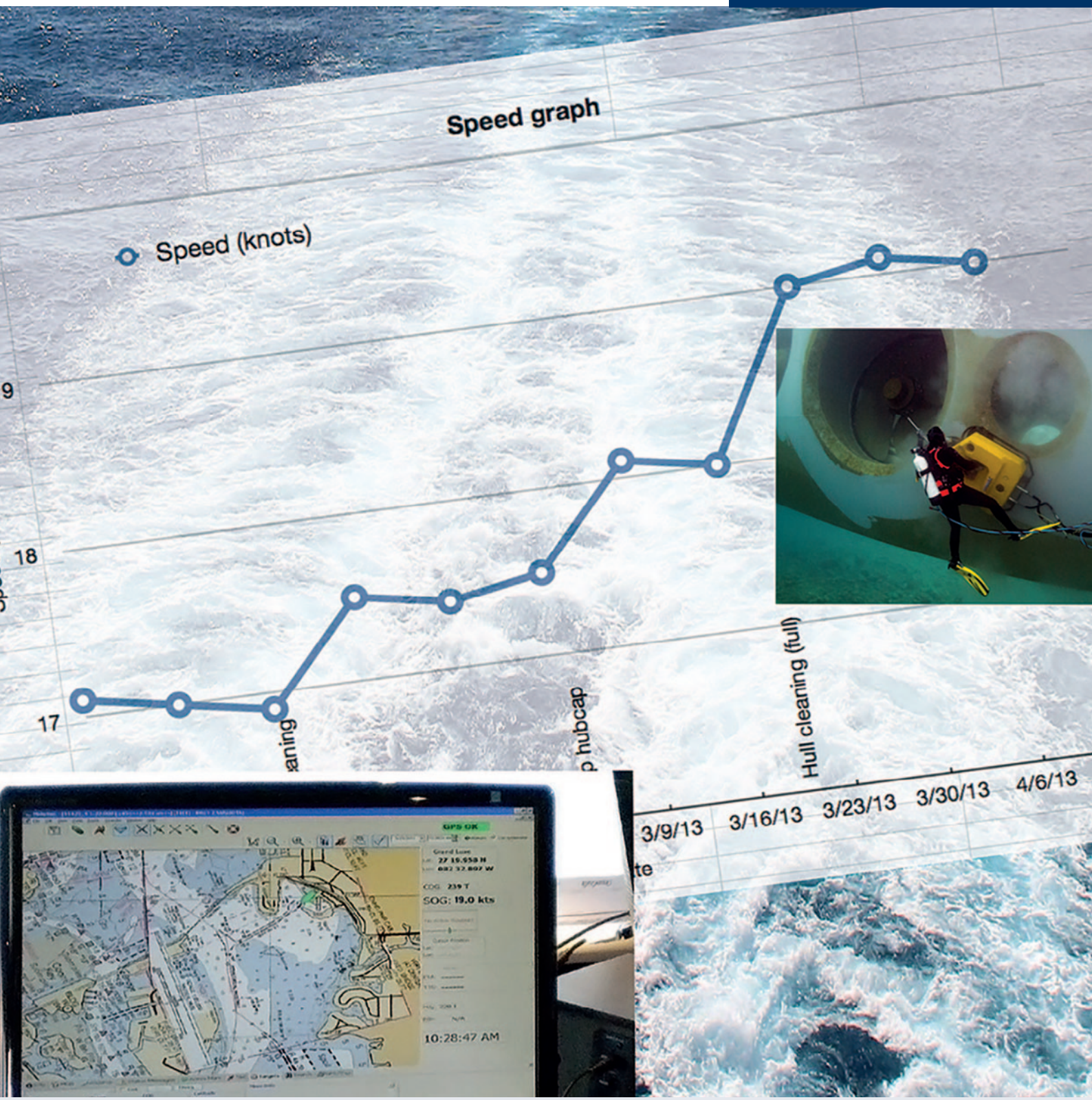
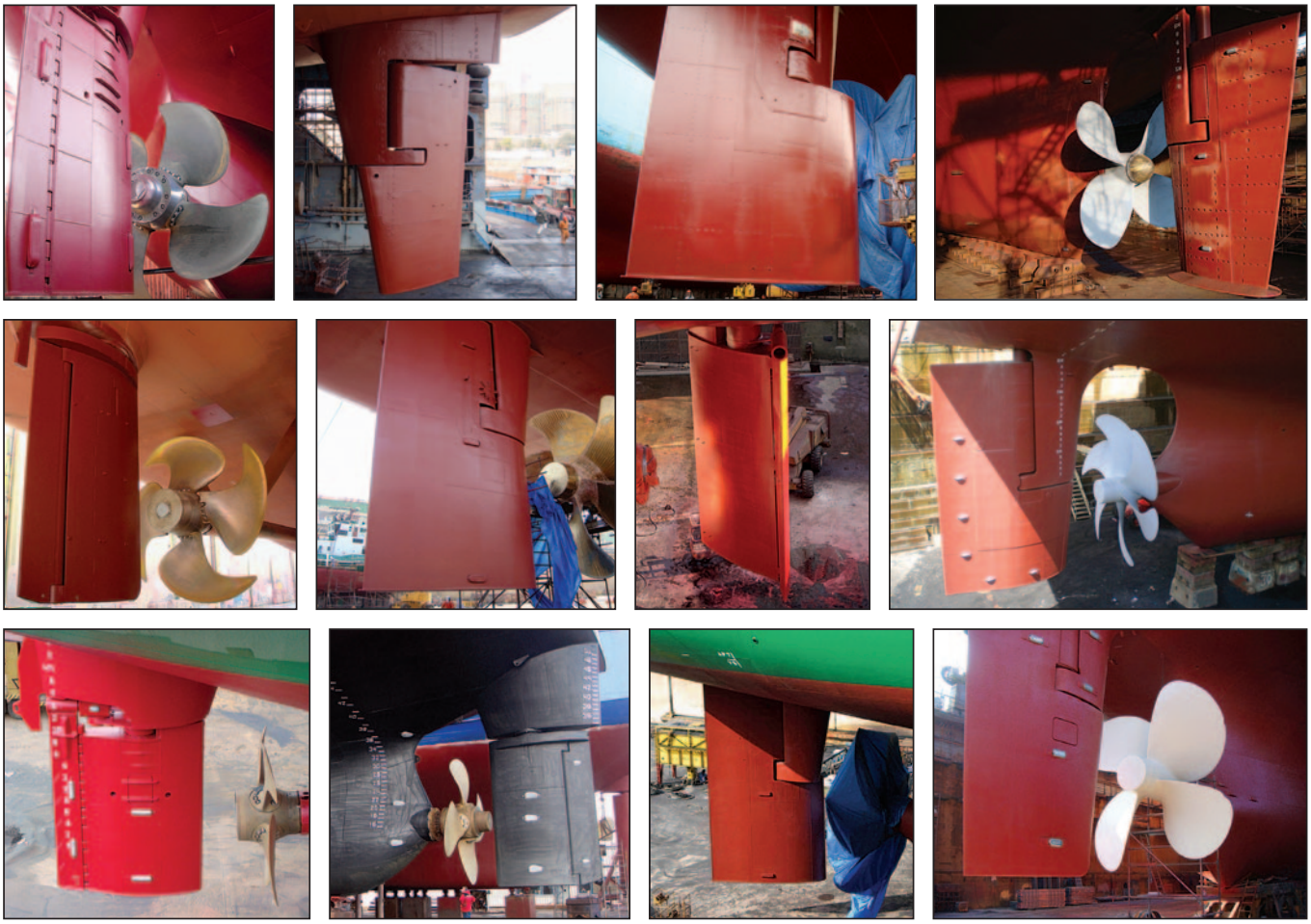
SUBSEA
PROTECTION AND PERFORMANCE

NEWS
LETTER / 267



Fuel savings with Ecospeed

LASTING PROTECTION



Ecoshield gives a very thorough and lasting defense against cavitation and corrosion damage for a ship hull's entire service life.

The coating equally provides the rudder with an impenetrable protective layer while its flexibility enables absorption of the forces that are produced by cavitation. This prevents the damage normally caused by this phenomenon.

Without proper protection against cavitation and the resulting erosion and corrosion damage, the financial consequences can be severe.

By removing the existing paint layers and applying Ecoshield on the rudder we can break the never ending cycle of painting, suffering damage, having to perform extensive repairs in drydock followed by a full repainting, again and again.

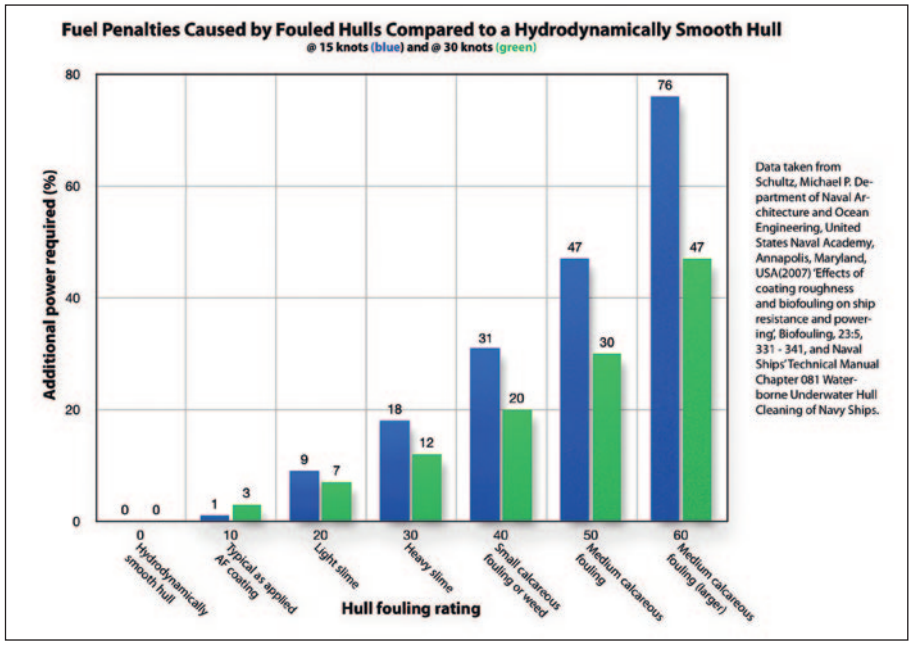
With an Ecoshield application no full repaint will be needed during drydocking. Ecoshield is guaranteed for ten years. At the most, minor touch-ups will be required.

Subsea Industries NV
+ 32 3 213 5318
info@subind.net
www.subind.net

ECOSHIELD®
ULTIMATE PROTECTION

Fuel savings with Ecospeed

Fuel is one of the largest ongoing expenses for any shipowner or operator, accounting for up to 50% of a vessel's operating costs. A cruise ship, for example, typically spends from $80,000 to $200,000 a day on fuel. The world fleet spends from $120 billion to over $200 billion a year on bunker fuel. Anything which can significantly reduce that fuel bill is of great interest to the industry. This article is about Ecospeed, a coating system which can greatly increase fuel efficiency for individual ships and the world fleet.

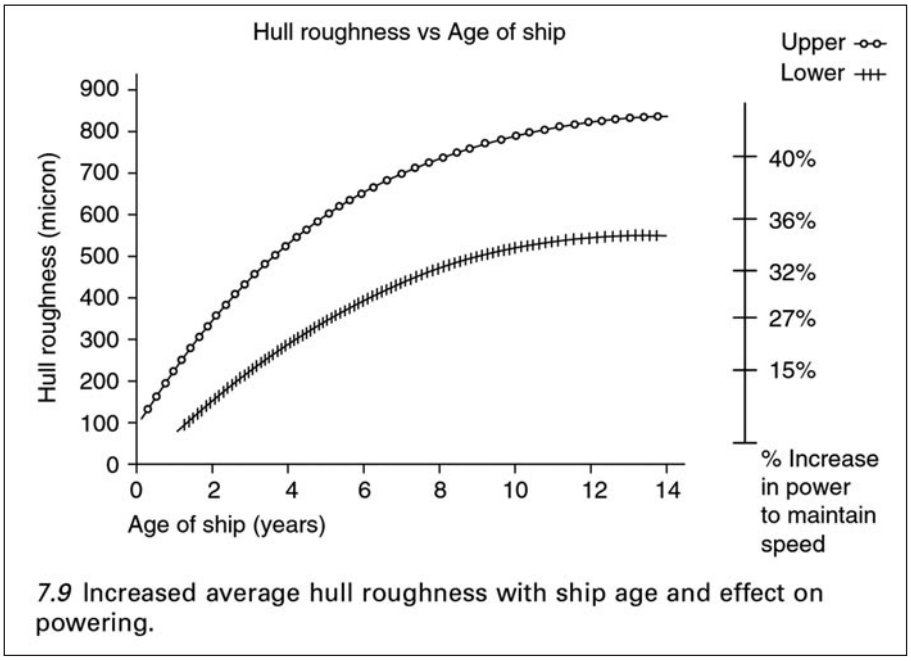


Why so much fuel?

An analysis in the Second IMO GHG Study explains:
"43% of the fuel energy is converted into shaft power while the remaining energy is lost in the exhaust or as heat losses. Due to further losses in the propeller and transmission, only 28% of the energy from the fuel that is fed to the main engine generates propulsion thrust in this example. … The majority of these remaining 28% are spent overcoming hull friction…."

Hull friction

Hull friction is the enemy of fuel efficiency. A very high percentage of the energy generated by a ship's engines is expended in overcoming the resistance to the ship's hull as it moves through the water. This is hull friction.



7.9 Increased average hull roughness with ship age and effect on powering.

From: T. Munk, D. Kane, D.M. Yebra, 7 - The effects of corrosion and fouling on the performance of ocean-going vessels: a naval architectural perspective.

Assuming that the ship's hull has been efficiently designed and built, there are two main factors that contribute to the fuel efficiency or inefficiency:

1. the roughness or smoothness of the hull itself which, assuming the ship has been well built, comes down to the paint, its application and its maintenance over time;
2. the degree of biofouling accumulated on the hull.

Making sure the hull coating is smooth and remains so, and keeping it clean of biofouling – even a small degree of accumulated slime – can save as much as 20% of the ship's fuel consumption or more. In the case of heavy fouling, the fuel penalty can be 80% or higher. This is a fact that has been known since the

Typical repair of an antifouling coating scheme in drydock, leaving the hull rough.

Hull of a cruise ship in drydock after 7 years with an antifouling coating.

Hull of the same cruise ship in drydock 5 years after Ecospeed was applied, with no recoating, just washed off in drydock.

days of sailing ships, where fouled ship hulls could cost a navy a whole battle due to loss of speed and maneuverability.

If the world fleet consisted of well-coated, smooth hulls that were kept clean of slime, let alone weed and hard fouling, this would save between $20 billion and $40 billion a year or more, with a proportionate reduction in carbon emissions.

The hull coating system

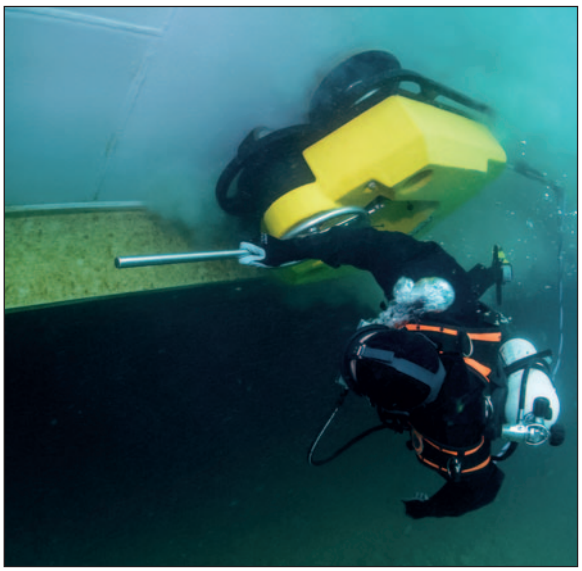
There are three main types of underwater hull coatings in use today: antifouling coatings (AF) which leach poisonous substances into the water continuously to kill vegetable and animal fouling before it can attach; foul release coatings (FRC) which have a slick surface which biofouling cannot easily attach to and which is designed to release any fouling that does accumulate when the ship moves, particularly at speed; and hard, inert surface treated composites (STC) which provide a hard, smooth surface which does not degrade over time and which can be cleaned in the water to remove accumulated fouling without harm to the coating or the environment.

They are listed above in order of prevalence in today's fleet. The biocidal antifouling coatings are by far the most common.

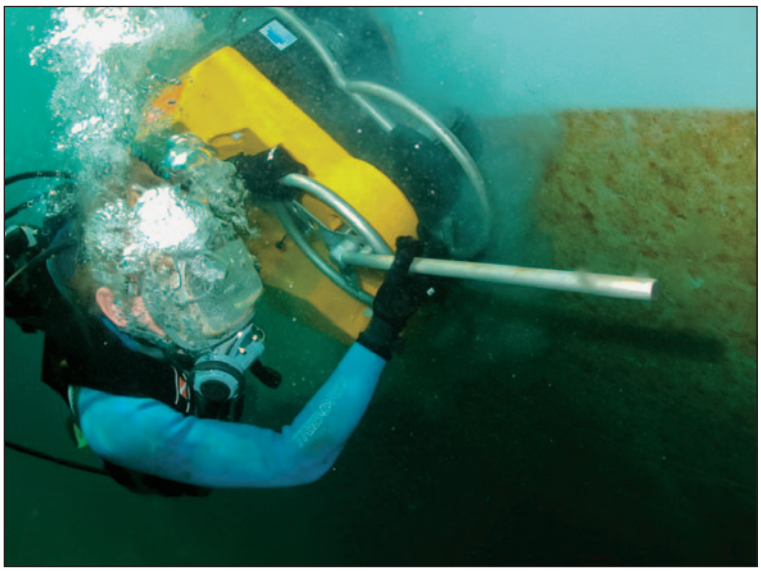
This article focuses on the third type of coating, specifically Ecospeed.

Description of Ecospeed

Ecospeed is a hull coating system designed to fully protect the hull for the life of the ship without need to repaint, while achieving maximum fuel efficiency throughout the ship's life. Because it is entirely non-toxic, it avoids any contamination or pollu-



Ecospeed can be cleaned in the water as often as needed to obtain maximum fuel efficiency throughout the service life of the ship.



Frequency of cleaning depends on the operating pattern and environment of the ship.

tion of the marine environment.

Ecospeed is a system consisting of a hard, inert glass platelet reinforced vinyl ester resin combined with in-water cleaning as needed to keep it free of biofouling.

These are the main characteristics which distinguish it from conventional antifouling and foul release coating systems:

- designed to last the life of the ship without any need to repaint. Minor touch-ups to repair mechanical damage are very easy to carry out, and leave the repaired coating as smooth as the original.
- does not emit any contaminants into the water, such as copper, zinc or other heavy metals, biocides such as pesticides or herbicides, PFAS or microplastics. It has been tested and proven to have no harmful effect on the marine environment.
- can be cleaned as often as needed in the water without any damage to the coating or loss of thickness and without any harm to the environment. Any degree of fouling can be safely removed. The coating is restored to its original smoothness.
- cleaning the coating underwater using the correct tools also has a buffing effect which will make the hull smoother over time. Trying to clean a conventional antifouling or foul release coating damages the coating, particularly if macrofouling has to be removed. Barnacles and other fouling organisms can penetrate the softer AF and FR coatings, whereas with Ecospeed they cannot.

Ecospeed in action

A notable fuel savings success with Ecospeed is the case of a major cruise line which applied the coating to four ships in its fleet. First, two existing vessels were recoated during routine drydocking. The ships sailed mostly in the Caribbean where fouling is fairly rapid. They were cleaned every 6 - 10 weeks on average in order to maintain maximum fuel efficiency. The president of the company stated publicly that these Ecospeed coated ships were saving 10% fuel costs compared with their previous AF coating.

Ecospeed can also be pressure washed in drydock without harm to the coating.

Cleaning Ecospeed in the water or in drydock leaves the coating in pristine condition with no loss of paint.

Based on this success, the cruise line applied Ecospeed to two newbuilds with even greater success. Because Ecospeed is so durable and designed to last, when the ships drydocked there was no need to repaint – at most some minor touch-ups of mechanical damage. This led to the officers and crew of the ships nicknaming Ecospeed the "wash and go" coating.

The cost of cleaning the ships 8-10 times per year was dwarfed by the fuel savings plus the additional savings of drydock fees, off-hire time, materials and labor required in maintaining the AF coating they had previously used.

There have been many other examples of fuel savings through correct application of the Ecospeed system.

Cautions

It must be noted that Ecospeed is not just another hull paint. It is a ship hull protection and performance system consisting of a special coating plus routine cleaning. When deciding to switch to Ecospeed or apply Ecospeed at newbuild, it is vital to take the cleaning requirement into consideration. As the coating does not leach any poison, it will accumulate biofouling. This will occur at different rates depending on the ship's sailing pattern and operating environment. Ships operating in the tropics will require cleaning much more often than those sailing in ice. The fouling will not damage the coating in any way and can always be cleaned off. We discuss each individual ship's situation and assist with working out how the cleaning requirements will be met.

Work is in progress on an industrial cleaning system that will not require divers and can clean a large container ship's vertical sides in an hour or two. Until now, the coating has been cleaned successfully with divers using powerful hydraulic in-water cleaning equipment or in drydock using high pressure washing.

Conclusion

Used correctly and cleaned often enough to keep the biofouling down to a light slime or microfouling, Ecospeed is capable of delivering the highest fuel efficiency of any ship hull coating system. To this is added the advantages of lasting the life of the vessel without the need for recoating, and the absence of any adverse effects on the marine environment. ■

The Oceanex Sanderling *entering The Narrows on its way to St. John's, NL. The* Oceanex *was coated with Ecospeed in 2011.*

Corrosion damage repair made very easy

Subsea Industries has a product for filling and building up a corroded and pitted steel surface to its original form prior to recoating with Ecoshield. Ecofix is as tough as the steel itself, machinable, and can be used to repair most pitting or corrosion damage on rudders, stabilizer fins, thrusters and other underwater gear.

Ecofix is used in combination with Ecoshield, the ultimate rudder protection coating. When a rudder or other piece of underwater ship gear has not been properly protected, the surface will become corroded.

Cavitation can cause severe pitting. The steel needs to be restored to its original shape with a smooth surface prior to recoating.

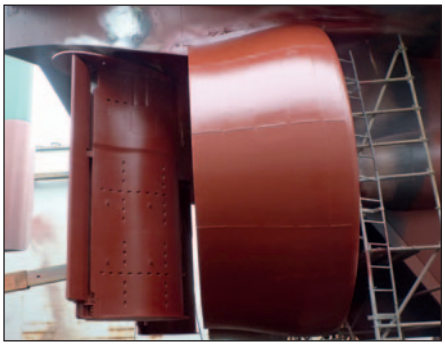
This is where Ecofix comes in. It is a superior, tested and proven filler. Because it uses the same basic resin as Ecoshield, the coating can be applied just one hour after the filler. The bonding and hardness are extraordinary. This is the effective alternative to very expensive fillers. And because it is part of the Ecospeed/Ecoshield family, it is fully compatible with our coatings.

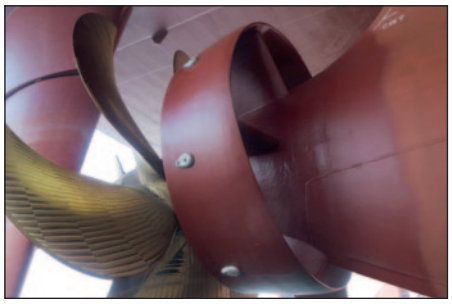
Subsea Industries NV
+ 32 3 213 5318
info@subind.net
www.subind.net

ECOFIX®
CORROSION REPAIR

SUBSEA

PROTECTION AND PERFORMANCE





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.

www.subind.net

Subsea Industries NV
+ 32 3 213 5318
info@subind.net

04/25