SUBSEA
PROTECTION AND PERFORMANCE

Magazine 206

Biofouling solutions

Subsea Industries is looking for representative agents

To support our continuous growth, we are expanding our worldwide network of Subsea Industries agents. This allows us to reach a much bigger public directly than would otherwise be possible.

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

The purpose of the Ecospeed range of coatings and cleaning technology is to offer a long-lasting, non-toxic protection for all ships with a system that keeps a hull ultra-smooth and free of fouling for the service life of the vessel with minimal repair and no replacement. Instead of using chemicals to kill and repel marine fouling organisms, Ecospeed uses a hard, impermeable, impenetrable coating along with manual removal of fouling at an early stage.

Contact us if you are interested in joining our network and help us build a strong relationship with our prospects and customers. We look forward to hearing from you.

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Editorial: Ecospeed offers all solutions

In 1993 we began researching and developing a new, long-lasting, non-toxic method of protecting ship hulls: Ecospeed. The coating system was introduced into the market in 2002.

Ecospeed is an environmentally safe underwater hull coating system that improves a ship's performance and provides it with long-term protection. It consists of a unique, entirely original and thoroughly proven system that combines the advantages of an easy-to-apply superior coating, a surface treatment for hydrodynamic optimization and a long term underwater maintenance service system. Ecospeed can be applied to all types of vessels, both newbuild and existing vessels.

Ice-going vessels

The benefits for ships facing harsh icy conditions are durability, corrosion protection of the steel and resistance to impact with ice. In short: protecting the asset, the hull of the ship. Ecospeed is a certified abrasion resistant coating. Owners are allowed to reduce the thickness of the steel of the ice belt if this area is coated with Ecospeed. This gives them a significant financial benefit during newbuild projects. Ecospeed is one of only a few coatings that have received this certificate.

British Antarctic Survey's *RRS (Royal Research Ship) Ernest Shackleton* is one of our best references. Ecospeed was applied to this ice-breaker eleven years ago in 2009. Since then the ship has docked several times. Only a few liters were required for small touch-ups. The second docking took place after operating for four years in severe ice conditions. Following the performance on *Ernest Shackleton*, the hard coating was applied in 2015 to the hull of sister ship, *RRS James Clark Ross*. Results were again exemplary. Ecospeed has also been applied to *RRS Sir David Attenborough*. The 15,000gt research vessel, which was officially named in September last year, is one of the most advanced polar research vessels in the world.

Cruise and ferry

A second focus is on cruise ships and ferries. While these vessels also benefit greatly from the corrosion protection Ecospeed offers, the efficiency of hulls treated with the coating system is maybe even more important. Ecospeed is applied once and can be cleaned as often as needed without restrictions and without damage to the coating. Even long stationary periods of six months or longer in tropic waters offer no problem. Ecospeed is designed to be cleaned. Other products also have to be cleaned, but were not designed for this. Foul-release coatings are not meant for cleaning, but to keep their speed they have to be cleaned anyway.

Cleanings are easy to organize because these ships are sailing on a fixed route. Ferries go from a to b and back and cruise vessels also go to fixed points with a schedule that is know well in advance. We can therefore easily implement a cleaning schedule. This allows owners to keep the friction of the hull low.

Environmentally safe

All members of our coating family are ecologically safe. When we started to develop Ecospeed back in 1998, this was one of our main goals. It still is.

Independent tests were carried out to provide scientific data and to authenticate the non-toxicity of the

Ecospeed hull performance technology. This research proved that the coating is 100% free of toxic substances and that there is no negative effect on the water quality or the marine environment at any point of its application or use. Moreover, the massive amounts of VOC and zinc anode emission associated with conventional hull coating systems are reduced to almost zero.

Ecospeed and biofouling

The underwater cleaning of Ecospeed prevents the spread of biofouling entirely. The cleaning frequency is optimized to minimize fouling. This prevents macrofouling from building up.

Underwater hull maintenance is carried out with specially designed underwater cleaning tools that simultaneously clean and optimize the smoothness of our coatings. This can be repeated whenever needed during the vessel's lifespan without causing damage to the coating's surface. It even significantly improves their hydrodynamic characteristics, keeping the surface hydrodynamically smooth and producing a major saving in fuel.

Several major ports have overturned the existing general ban on underwater hull cleaning, specifically making an exception for vessels coated with Ecospeed.

Many case studies can be found on our website. With some vessels sailing for ten years and counting without requiring repainting.

Subsea Industries NV
Boud Van Rompay
Founder

RRS Sir David Attenborough receives lifelong protection from Ecospeed


© Jon Payne

When the polar research ship RRS Sir David Attenborough was launched its hull was protected by the most environmentally-safe hull coating ever developed: Subsea Industries' ice abrasion resistant and washable Ecospeed.

RRS Sir David Attenborough is now afloat with a hull protected by the same Ecospeed coating that has protected its sisters, Ernest Shackleton and James Clark Ross, for many years.

The vessel will undertake world-leading environmental research into climate change and ocean protection. As such, the vessel required a fully ice-strengthened coating, without being harmful to the environment. Ecospeed fulfils that requirement.

Ecospeed is a safe, hard-type coating with zero toxic compounds. It eliminates the potential pollution of polar waters with heavy metals or biocides and hull contamination during research activities, which is extremely important to the scientific work the vessel will carry out.

Contact us for further information on the cost and energy savings Ecospeed will bring for your (ice-going) vessels.

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White Paper Abstract

Biofouling: A Proposed Solution

One hears and reads a great deal these days about biofouling also referred to as aquatic invasive species (AIS), non-indigenous marine species (NIMS), non-indigenous species (NIS), aquatic nuisance species, alien species and a number of other names. We shall refer to them here as NIS.

NIS are an economical as well as an environmental problem.

For some time the concentration on the shipping industry's role in the spread of NIS centered on ballast water. More recently the focus has extended to include ship hull fouling as a vector of NIS translocation just as important as ballast water if not more so.

The NIS threat is increasing due to more shipping traffic and also perhaps because the antifouling systems in use since the ban of TBT have been generally much less effective in eliminating hull fouling.

It is more efficient and far less expensive to prevent the translocation of NIS in the first place than to try to clean up the damage they cause and eliminate the now-established species and prevent their further spread.

Legislation and regulation to prevent the spread of NIS via ship hull fouling is increasing in severity with some quite rigorous measures looming.

Efforts to deal with the problem to date have not been effective. It is generally agreed that in-water cleaning must be part of any handling, yet the antifouling and foul release coatings in general use impose severe restrictions on in-water cleaning. Frequent drydocking is not economically or logistically feasible.

The time is right for a thoroughly workable solution which is acceptable to governments, port authorities, environmental groups and the shipping industry. The ideal solution would also bring with it fuel savings, reduction of GHG and other emissions and elimination of the contamination of ports and oceans caused by heavy metals and other toxicants contained in traditional biocidal antifouling paints.

So far the efforts of states and ports have been in the direction of preventing ships arriving in their waters with fouled hulls and NIS. For example, the ANZECC code (currently under review) forbids in-water cleaning of vessels in Australian waters for fear that incoming vessels will bring NIS into Australia which will then establish themselves there. But forbidding in-water cleaning means that vessels leaving Australian ports, especially those that have been laid up for some time, will sail with a fouled hull and carry invasive species picked up in Australia to other parts of the world. This may appear to help with the local problem but in fact magnifies the international situation. And NIS is by its very nature an international problem.

A novel approach would be for ports and states to at least place equal emphasis on ships sailing from their port of departure with a clean hull. This would require international cooperation but the IMO is there to make sure that such international cooperation on important shipping related matters is obtained. And if such a solution also carried with it great financial benefits to shipowners/operators the world over, then it is quite likely to be accepted and adopted.

Published in 2012.

The two major barriers to effective handling of the global NIS problem are

1) the hull coatings in general use are not suitable for in-water cleaning, but in-water cleaning is an essential part of the solution to NIS;

2) in order for the NIS spread to be curtailed, ships must *leave their port of origin with a clean hull* and concentration needs to be on the beginning of the voyage just as much or more than on the state of the hull at

A typical "niche area" of a hull, painted with a conventional biocidal antifouling paint.

the port of destination. Ships do not foul while sailing. They foul when they are stationery.

A great deal of work has been done on the subject of NIS by the IMO Marine Environmental Protection Committee's Correspondence Group on the development of measures to minimize the transfer of invasive aquatic species through biofouling.

This White Paper outlines an existing, workable, environmentally and economically beneficial method of eliminating the threat of further spread of NIS via the ship and boat hull fouling vector using only currently extant, proven technology and methods. ■

If you are interested in receiving a digital or printed copy of this White Paper, contact us at info@subind.net or +32 3 213 53 18.

Performing coating systems for different applications

In the editorial of this magazine you can read about the benefits Ecospeed offers. In this article we look at the other coating systems in the Subsea Industries family. There are many reasons why choosing our products is the best option for a ship owner. Depending on your situation, a different product will fit your needs.

Rudder of container vessel after five years in service.

Ecoshield offers the best possible protection for a rudder's entire lifespan.

ECOSHIELD®
ULTIMATE PROTECTION

Ecoshield is an enhanced version of Ecospeed. Small but significant variations of the Ecospeed formula have been tested on rudders since 2002 with extraordinary results. After years of testing (initially under the name Ecospeed Strong) the product was launched in 2013.

Ecoshield is designed to protect rudders and other underwater running gear against the cavitation phenomenon: against pitting, corrosion and erosion. We have a constantly growing number of new and returning customers. We have vessels sailing with the coating system on their rudders for up to ten years and counting. When they come into drydock, the coating is always in very good shape. Since 2013 Ecoshield has been applied to the rudders and thruster nozzles of ten vessels owned by Greek ship owner Pleiades Shipping Agents. Some of these vessels have since drydocked but their rudders and nozzles experienced zero cavitation damage and did not need to be recoated. We recently had a customer who said that 'the coating simply works'. This

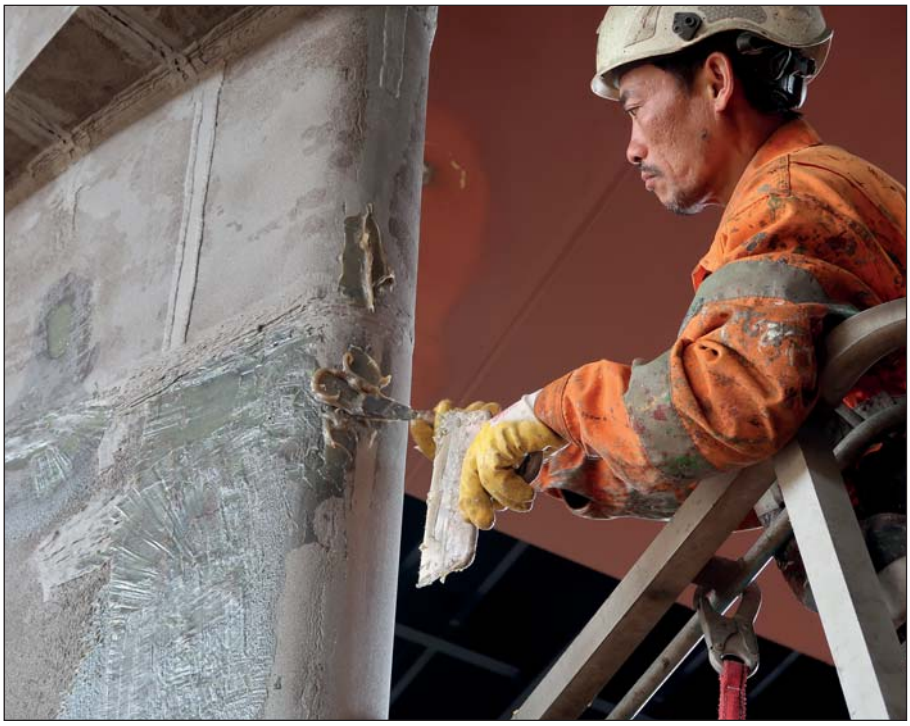
Application of second layer.

was when one of his vessels docked five years after application.

Ecoshield is not only used on rudders, but also on thrusters, thruster tunnels, nozzles and other running gear. We are also in communication with OEMs to include Ecoshield in the newbuild plans of their products. This allows them to offer their customers a complete package with lasting protection.

ECOFIX®
CORROSION REPAIR

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



Applying Ecofix on the corroded areas of the rudder.

The rudder is now ready for Ecoshield application.

No further corrosion or pitting damage will appear on rudders treated with Ecofix and Ecoshield.

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 damage 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 ingredients 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 metal facing or very expensive alternative fillers. And because it is part of the Subsea Industries family, it is fully compatible with our coatings.

ECOLOCK®
LIFETIME CORROSION PROTECTION

Ecolock is used on stationary offshore units. The main benefit of the coating system is corrosion protection and the possibility to clean it.

Floating Storage and Regastification Unit (FSRU) during its undocking.

Ecolock is an extremely tough and durable coating designed to remain in excellent condition for 25 years without drydocking, repair or replacement.

Finished application on one of the blocks of FSRU.

These units are designed to stay on location for 15, 20 and even up to 30 years. Hull integrity and corrosion protection is a major thing. Class demands an underwater inspection twice every five years to see if the hull is in good shape. So the hull must be cleaned to allow these inspections. If the hull is cleaned on a frequent basis, say every two years, this offers no problems at all.

The standard warranty is ten years, but for Ecolock this can be extended to 15 or 20 years. This is really a guarantee, not just a commercial promise.

Over the last couple of years alone we have done several big offshore projects, including two project for Exmar NV. Exmar, headquartered in Antwerp, Belgium, introduced the world's first floating LNG liquefaction barge, the Caribbean FLNG, in 2013. The main reason for choosing Ecolock was to protect the underwater hull from corrosion for at least 15 years without having to drydock or repair or replace the hull coating. Another key factor in choosing the hull coating system was the need for a clean, environmentally safe hull to facilitate the required class inspections.

One of our Ecolock projects was planned to be deployed in locations where there is a lot of fishing activity. So besides durability and the knowledge that the coating would stay on for long enough, the owner and the local authorities wanted to be absolutely sure that no toxic elements would be leaching into the aquatic environment. Not during regular activity and not during cleaning.

Ecolast will keep its color because it is highly ultraviolet resistant, which is a key benefit for offshore wind farms.

ECOLAST®
LONG TERM UV RESISTANT

The final product in the family is Ecolast and was launched in 2016. This coating is ultraviolet (UV) light resistant and preserves its color while at the same time offering the corrosion and abrasion protection our coatings are known for.

Regular coatings will quickly lose their original color when exposed to the ultraviolet radiation present in sunlight. This is problematic when colorfastness is required, as is the case in for example offshore wind farms.

Ecolast is highly resistant against salt, ultraviolet radiation, waves or even ice. Mechanical damage to the coated surface is minimized. This is especially important for (semi-)submerged structures like wind turbines that are located in splash or tidal zones.

Like all other coatings systems in the Subsea Industries family, Ecolast is also unaffected by corrosion. As a result no repaint is required once the coating has been applied.

Contact us today

If you want information on any of these coatings, do not hesitate to contact us. Our team will gladly assist you. If you drop us a line, we can tell you how our coating systems can benefit you. We will look at your specific situation and give you all the data you need.

This will allow you to make an informed decision on the next, and last, underwater hull coating for your ship or offshore structure. ■

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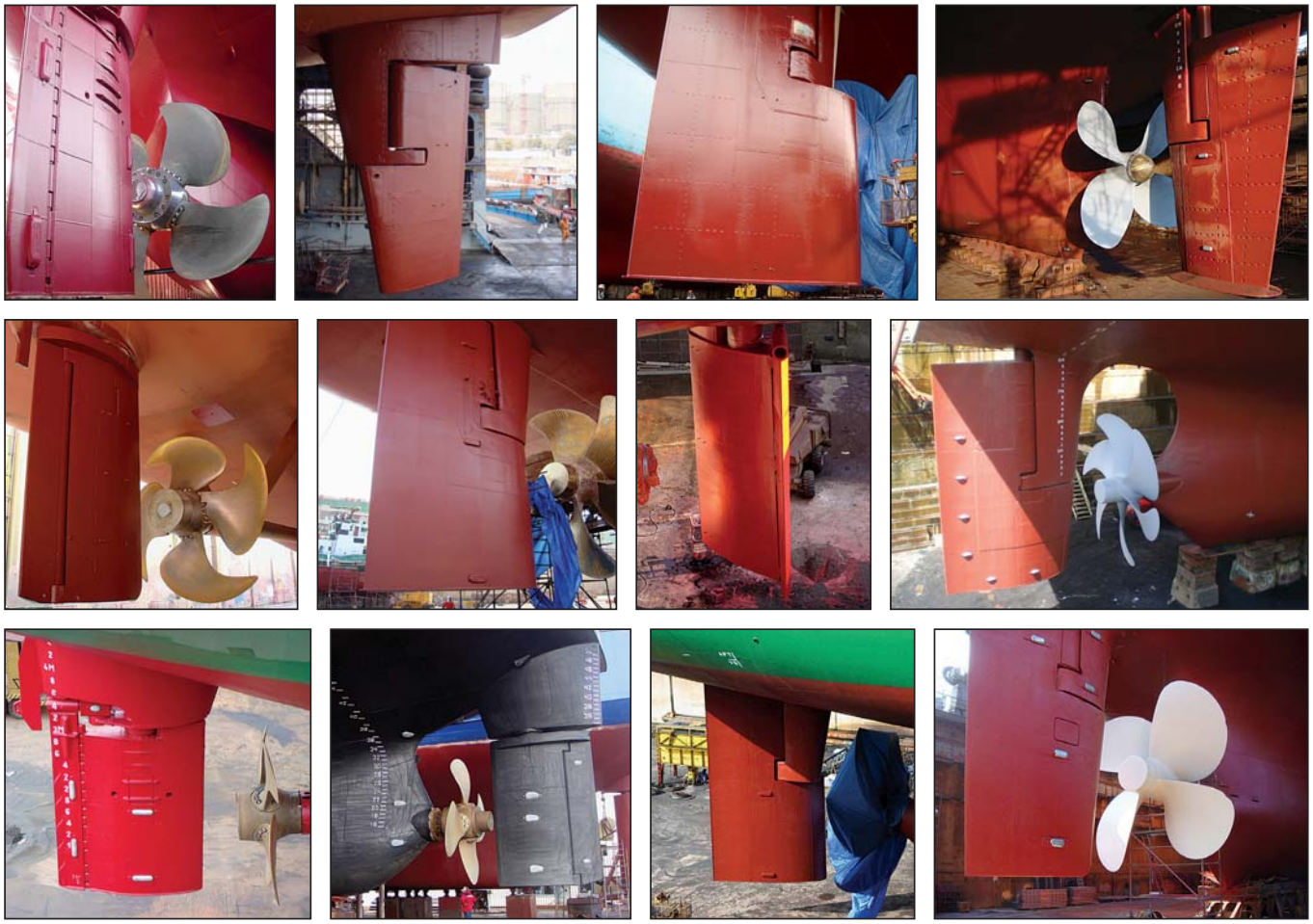
LASTING PROTECTION



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.

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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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03/20