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Corrosion damage very repair made ✓ 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.

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Editorial

Welcome to the latest issue of our Subsea Magazine. In it you can read about Ecoshield, our coating for underwater running gear.

Throughout the years I have seen firsthand the damage cavitation erosion causes to ships' rudders, running gear and the stern areas. It is a costly problem to repair, unless you have coated these underwater components with a system capable of significantly reducing the phenomenon.

Our Ecoshield coating is one such solution and has proven to work. The coating was developed especially for areas that are subject to cavitation and gives permanent protection against cavitation damage for all running gear.

Existing rudders that have not been properly protected may have experienced corrosion or cavitation damage. That is where the compatible filler Ecofix comes into play. The repair work needed on the underlying steel can be done effectively and economically prior to an Ecoshield application.

Besides Ecoshield and Ecofix, the line of durable non-toxic coatings includes several other coatings systems.

Ecospeed is our flagship coating and was the first to be launched commercially, in 2002. It is a hull coating system which provides long-lasting, non-toxic protection for all ship hulls. The hull is kept very smooth and free of fouling for the service life of the vessel. It requires minimal repair and no replacement. Correct



use of the system results in major fuel savings compared to conventional coating systems.

Focusing on its ice-going capabilities, the original coating was refined to create Ecospeed Ice. This is the proven, ultimate hull protection for icebreakers and ice-going vessels. It is designed and formulated to last the life of the vessel with no need for replacement. Ecospeed Ice simply stays on the hull no matter the conditions of sea and ice. It has ice-abrasion resistance classification Polar Code 1 – 7. Plate thickness can be reduced considerably in areas where the coating is applied.

In 2015 Ecolock, designed for offshore units, joined the ranks. Ecolock is an extremely tough and durable coating designed to remain in excellent condition for 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 without harming the coating or the marine environment.

The last members of the family is Ecolast, an ultraviolet (UV) resistant coating that preserves its color. Ecolast is highly resistant to salt, UV 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.

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. But all the coatings have in common their extreme durability, service life and the lack of toxic emissions.

We hope you enjoy reading this magazine. Do not hesitate to contact us if you have a question or want to know more about the benefits our coating systems can offer.

Subsea Industries NV
Boud Van Rompay
Founder

Ecoshield protecting increasing numbers of rudders and running gear

Many of the world's leading shipping companies rely on Ecoshield to protect the rudders, thruster tunnels and other parts of the underwater ship prone to cavitation erosion and chemical corrosion. Several of these companies have been using Ecoshield successfully for a decade or more. Others are newer to the product but are wasting no time in putting it to use.

Origins

We began to use the power of our coatings to protect ships from the ravages of cavitation damage back in 2004 when shipowner Ernst Russ found out that they had a severe cavitation erosion problem with the rudders of five sister ro-ro ships built in 1999.



Grzegorz Girjat, Superintendent at Ernst Russ, inspecting the Ecospeed coated stabilizer fin of the Elizabeth Russ.

Almost magically, Ecospeed appeared on the scene. Ernst Russ began by testing it on the rudder of one ship, the *Elizabeth Russ*. Before

they drydocked again two years later, underwater inspections had shown them that their cavitation erosion problems were over. They went on to apply Ecospeed to all their ro-ro ships with the same result, even in the case of those that were trading heavily in ice. "None of the rudders have sustained any further cavitation damage," said Grzegorz Girjat, Superintendent at Ernst Russ. "They have been touched up where the paint was chipped or scraped, but the cavitation damage to the rudders ended with the first application of Ecospeed."

Ecoshield – even tougher

We went on to develop an even tougher version of the Ecospeed coating which we originally named Ecospeed Strong but have since renamed Ecoshield, because that's what it is.



The bulbous bow of the Friedrich Russ one year after it was coated with Ecoshield's predecessor Ecospeed, including a winter sailing in ice.



Applying the second coat (red) of Ecoshield to the boot-top of the MSC Vanquish II.



Rudder of the MSC Ziata R after the first coat of Ecoshield has been applied.



Rudder of the MSC Ziata R with second coat of Ecoshield almost complete.



Rudder of the Seaspans Santos 8 years after Ecoshield was applied, with no repaint during that time.



The rudder of the Pleiades Evrotas after being washed down in drydock, 5 years after initial Ecoshield application (no repaint).



Danaos coated many of their rudders with Ecoshield. This is the Deva five years after the initial application, with no repainting.

To date there have been at least 700 separate Ecoshield applications to rudders, thruster tunnels, Kort nozzles, energy saving devices such as Becker Twisted Fins®, thrusters, sta-

bilizer fins, Hull Vanes®, bulbous bows and other parts of the underwater ship hull and running gear that need special protection from the effects of cavitation.

An extraordinary fact we discovered about Ecoshield is that it need only be applied once. It lasts the life of the vessel without the need for repainting beyond minor touch-ups of mechanical damage. We found this out when ships were coming into drydock ten years after the original Ecoshield application and only needing a couple of liters of paint for retouching mechanical damage.

Experience also showed that Ecoshield properly applied makes the use of sacrificial anodes unnecessary. This has been proven time after time.

Veterans and newcomers

The shipowners and operators who apply Ecoshield to the rudders and running gear of their ships, either at newbuild or during routine drydocking, can be divided into two main



Second coat of Ecoshield being applied to a ship's rudder and Kort nozzle. This protection is expected to last the life of the vessel.



Ecoshield being applied to a Hull Vane for a navy ship.

categories: new users who are trying Ecoshield out for the first time; and owners such as Ernst Russ who have long been convinced of the efficacy of Ecoshield and continue to apply the coating to their whole fleet as their ships come into drydock or as new vessels are built.

Recent adopters

Mediterranean Shipping Company (MSC), the world's largest container line, began systematically applying Ecoshield to their container ships about a year ago to solve cavitation erosion and corrosion damage. On most of the ship, Ecoshield is applied to the rudder and thruster tunnels. They have also coated some ships' boottops where a tougher coating was required. All in all, over the last year, MSC has ordered Ecoshield for over 100 ships. Of these, more than half have already

been applied.

Singapore-based MTM Shipmanagement discovered Ecoshield in 2020 and has since applied the coating to the rudders and thruster tunnels of many of its tankers.

Athens-based Eastern Mediterranean Maritime Ltd., began using Ecoshield in 2020 to protect rudders that were suffering from cavitation damage. Since then they have also applied the coating to the Mewis ducts of several of their ships.

Sunship Schiffahrtskontor KG, a full service shipmanagement company based in Emden, Germany, is another more recent adopter of Ecoshield. They coated their first rudder in 2019 and have since done six more.

The Israeli Navy applied Ecoshield to the rudders of several of their new

corvettes to stop the severe cavitation damage that showed up after just a few days of sea trials using traditional hull coatings.

DEME, leading Belgian contractor in the fields of dredging, offshore energy, environmental remediation and marine infrastructure recently applied Ecoshield to the rudders and Kort nozzles of two of its dredgers.

These and many other shipping companies are finding out, usually by word of mouth through the yards, ship managers and superintendents, that Ecoshield is something special and can solve problems that are beyond the scope of the coatings they are used to.

Long-term Ecoshield users

Of course the real proof of the effectiveness of Ecoshield comes five,



SCICON worldwide paint inspector verifying the preparation of a Kort nozzle for DEME dredger Charlemagne.

ten or more years after the first application when the ship owner or operator has had a chance to see the results after one or more drydocking intervals.

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 close to 100 ships. CMA CGM use Ecoshield on their in-service ships when they come into drydock and also on new builds so that they can be perfectly protected from the very start of their life. Just in the last year and a half, CMA CGM have applied Ecoshield to over 20 vessels.

Seaspan, the Canadian worldwide leader in independent containership management discovered the value of Ecoshield in 2010. Since then, they have experienced great success with using the coating to protect the rudders, thruster tunnels, Becker Twisted Fins® and draft marks of nearly 75 ships under their management, including many newbuilds. “We saw that no repair of the Ecoshield was needed on rudders that were coated 9 or 10 years ago...,” said Emilian Jianu, Coating Performance Specialist for Seaspan. “Compared with conventional coatings, we save somewhere between one and three days in drydock per ship... We are planning to apply Ecoshield on the rudder blade and bow thruster tunnel on all our upcoming newbuilds.”

Danaos Shipping, one of the world’s largest independent container charter ship owners, traces the use of Ecoshield for their rudders back to 2008. About 40 successful applications later, they have extended the use of Ecoshield to thruster tunnels and other parts of their ships, continuing up to the present.

There are many other long-term users. Nippon Yusen Kaisha Ship Management (NYK) began using Ecoshield for the rudders, thruster tunnels and stator fins of their ro-ro fleet in January 2013. They had such success that they have gone on to coat the rudders and thruster tunnels of the close to 30 vessels in the fleet.

Anglo Eastern Ship Management has been using Ecoshield on rudders, thruster tunnels, ICCP areas and other parts of their ships since 2013.

Höegh have coated rudders, Kort nozzles, belts, stern areas and side ramps of more than 30 of ships.

Pleiades began using Ecoshield in 2013 and continues to successfully protect its ships rudders and nozzles as new ships are added to the fleet.

Lessons learned

The earliest Ecoshield users going back almost twenty years, continue to come back to use the coating for new ships or additional parts of existing ships.

The word seems to be getting around as we see some very major players in the shipping industry expanding the use of Ecoshield throughout their fleet, and others newly turning to Ecoshield to resolve their cavitation erosion problems. ■

The washable coating

Ship hulls should be protected with a system that lends itself to fast, effective cleaning without risk of damage to the coating and without posing any kind of hazard to the environment. Ecospeed is this system.

There is currently no hull coating available which will not foul. The only way to remove this fouling is to clean it off. The Ecospeed coating has a glassy surface that was designed to be washed without being damaged. This enables fast and efficient fouling control throughout a ship's entire service life.

Fast and easy cleaning

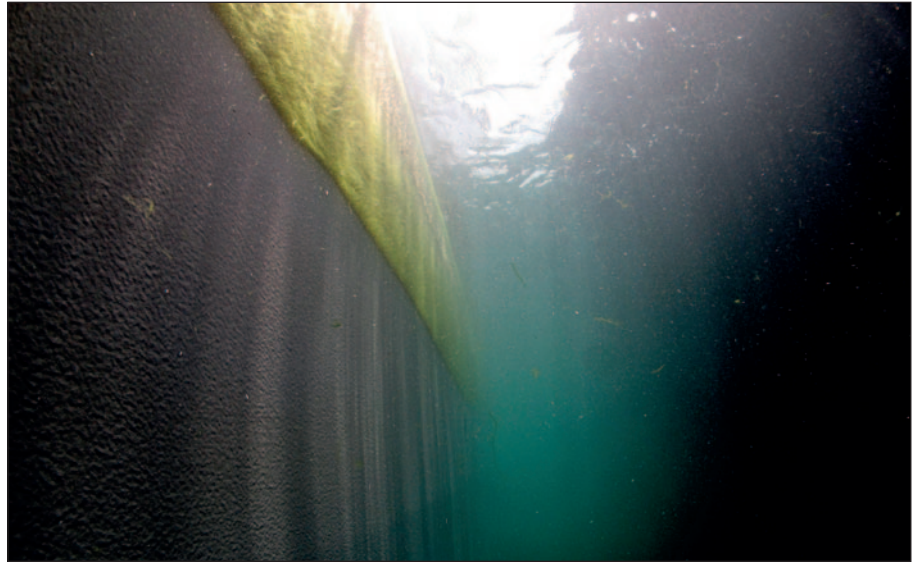
Underwater maintenance

Underwater maintenance of Ecospeed is carried out with specially designed underwater hull cleaning tools that simultaneously remove all fouling and optimize the smoothness of the paint surface. It allows divers to clean the flat areas as well as the harder to reach parts of the hull without damaging the coating.

One of the many unique characteristics is that with repeated underwater hull cleaning Ecospeed's surface improves. Cleaning can be carried out whenever needed, at any point in the coating's lifespan.

High-pressure cleaning in dry-dock

Ecospeed can also be cleaned in drydock with high pressure tools. The coating is always in an as new, excellent condition after a high pressure washing and no material is



Fouling on Ecospeed can be removed fast and easy.

lost. Only the fouling is removed. The coating stays on the ship instead of dispersing in the water and contaminating the shipyard and the surrounding waters.

Several of our customers use this

method to have their vessels cleaned. Their ships are taken out of the water, cleaned with high pressure tools and put back in the water in a matter of hours. They all said that this approach helped them get through the financial crisis.



An Ecospeed application is adapted to the shipyard's schedule and not the other way around.



Fouling can be washed off in drydock with high pressure tools or underwater while improving the coating.



Ecospeed underwater maintenance is carried out with specially designed equipment.



With Ecospeed the coating is always in an as new, excellent condition after a high pressure washing.

Fewer drydockings

There has been a trend of extending the maximum drydock interval to seven and a half years or even ten years, if a stringent set of rules is followed. One of the requirements is a very strict underwater maintenance plan. Ecospeed's qualities make the coating ideally suited for such a regime. Regular underwater cleaning will maintain and improve the ideal surface characteristics. The biggest barriers to ships staying out of drydock for seven and a half or more years are dealing with bio-fouling and maintaining hull coating integrity. Ecospeed allows ship owners and operators to overcome both these barriers.

Long lay-up periods have no negative effect

The coating is also suited for ships which have a stationary period because an impermeable and impenetrable barrier is created. This gives the coating its excellent and durable anti-corrosive properties and protects the underwater hull against mechanical damage. Despite the aggressive nature of certain types of fouling, no corrosion or damage to the steel will be present on the underwater hull of the vessel after cleaning. Hard fouling is unable to penetrate or damage the coating.

Environmentally safe

Toxic-free

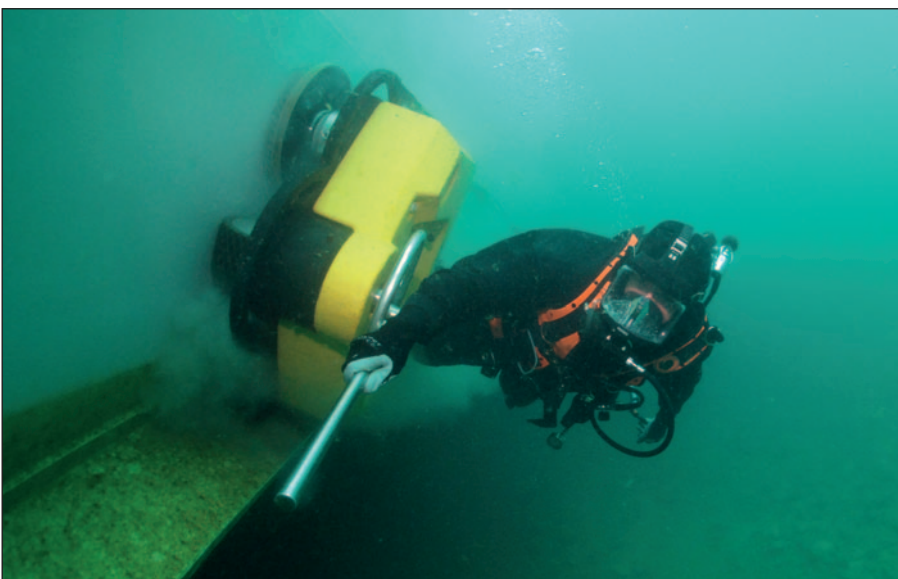
Ecospeed is 100% non-toxic and there is no negative effect on the water quality or the marine environment during maintenance.



Ecospeed is applied in only two, homogeneous layers.



Ecospeed is 100% non-toxic.



Regular underwater treatment of Ecospeed is at the moment a Best Available Technology to minimize the risk of biofouling transfer.

The definite biofouling solution: clean before you go

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.

Removal of the ban on underwater cleanings

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

Conclusion

Ecospeed is an entirely different, more cost-effective and environmentally acceptable approach to hull protection and anti-fouling.

There is no need to reblast and re-coat the hull; no corrosion, no impact on the environment and, if regular hull cleaning is carried out, fuel savings of up to 50% can be achieved. ■

Wash it when fouled

ECOSPEED®
SHIP HULL PERFORMANCE TECHNOLOGY

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.

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