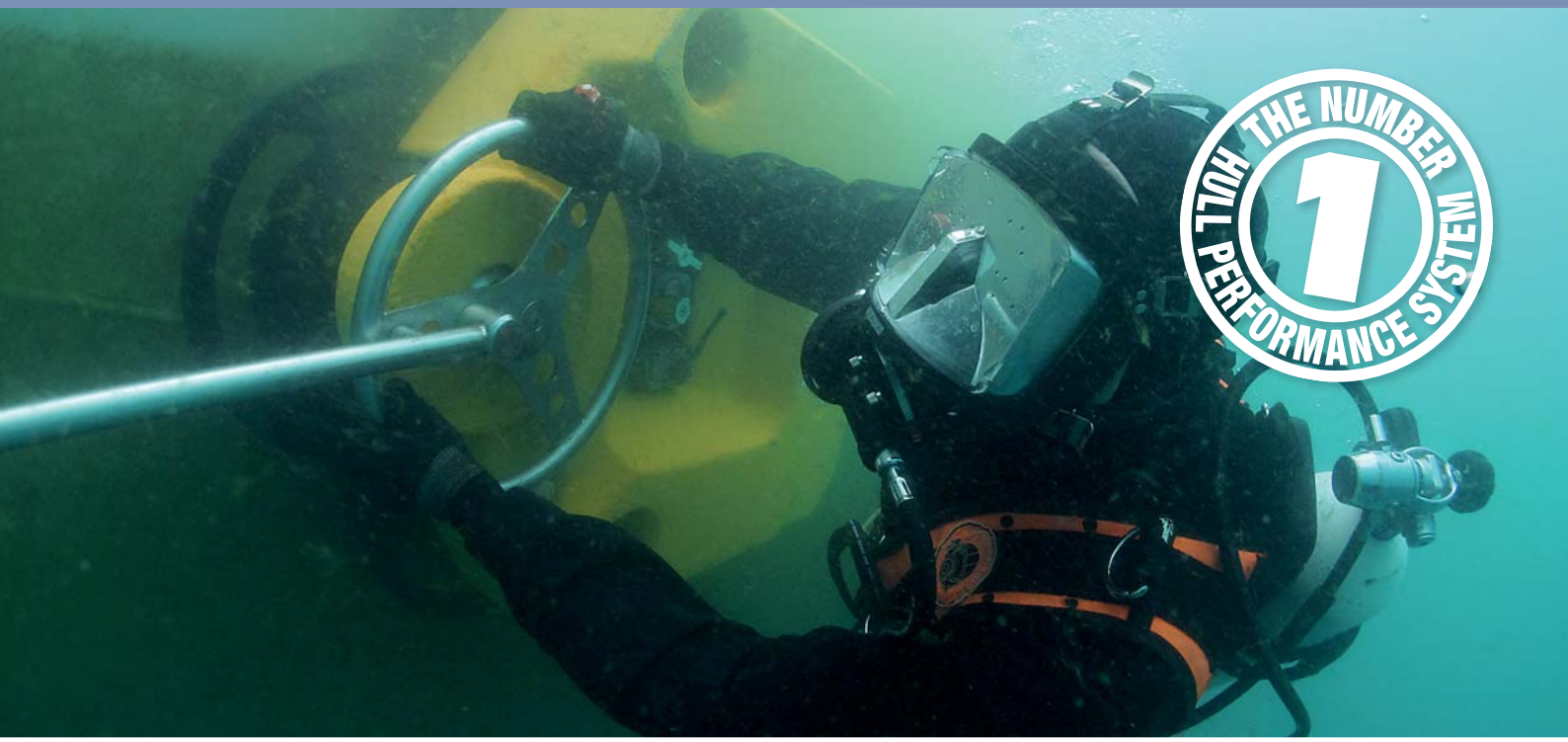
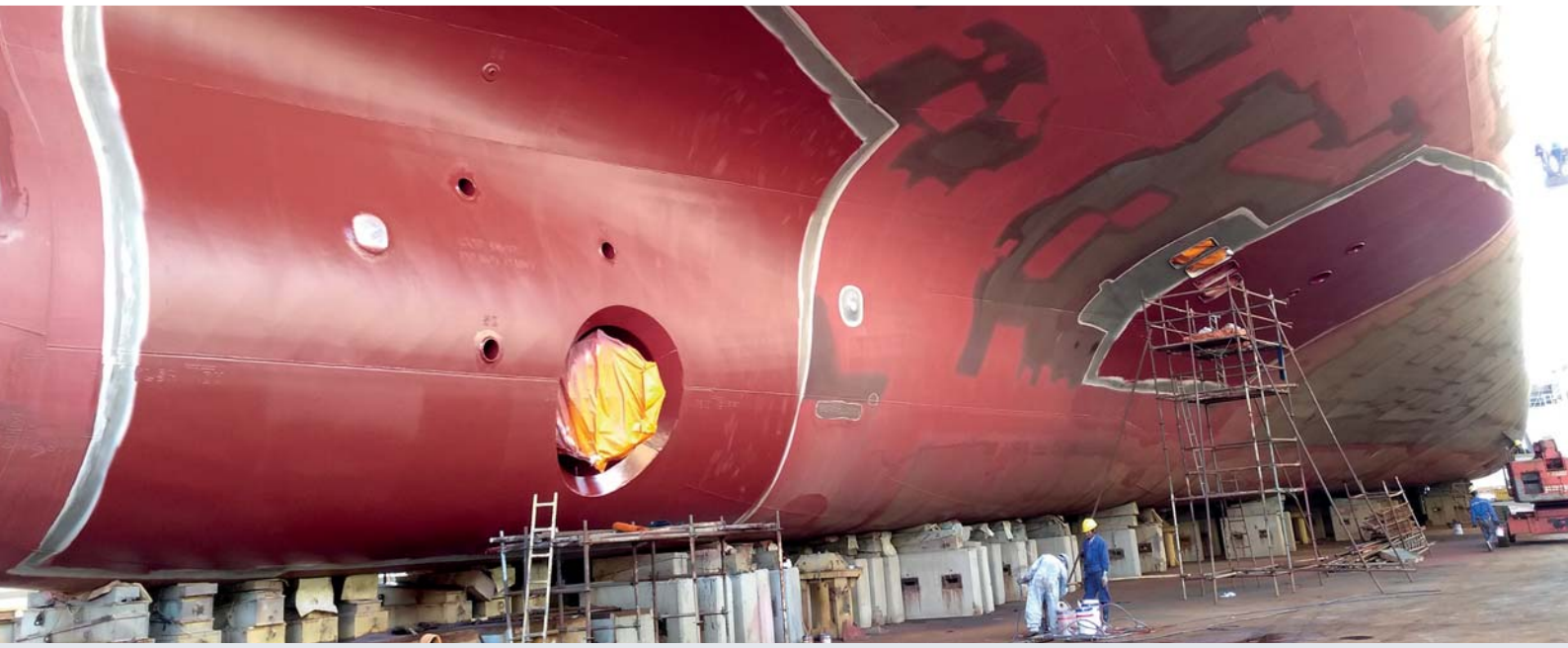
SUBSEA

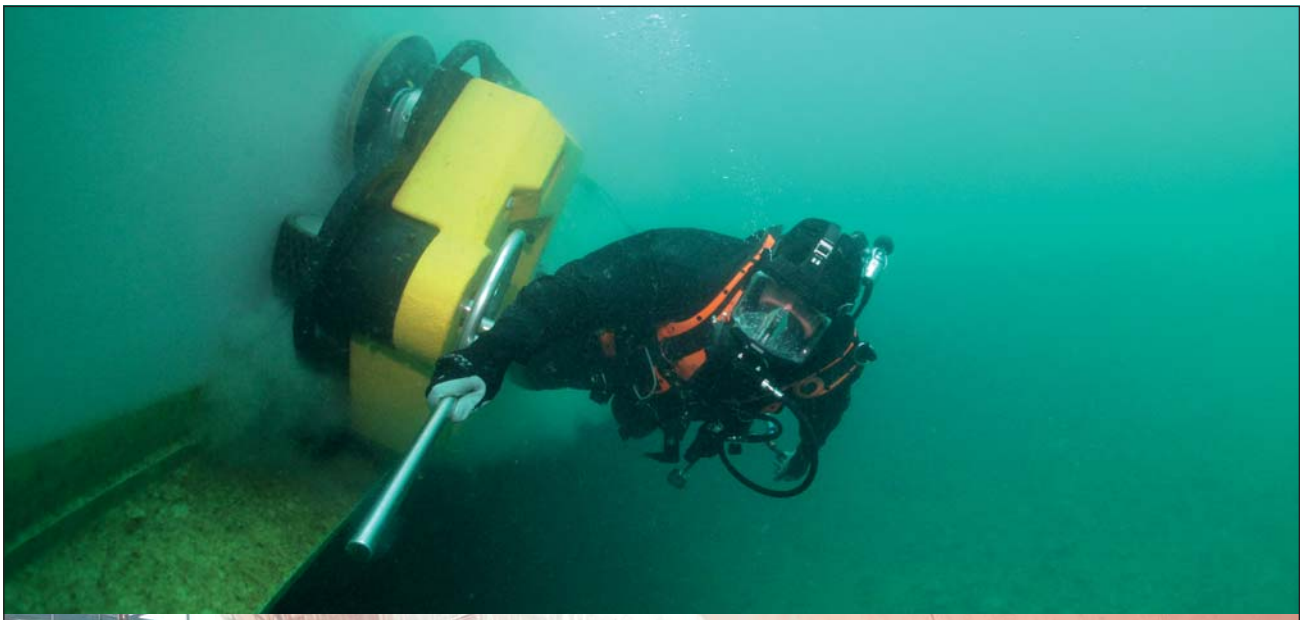
PROTECTION AND PERFORMANCE

Magazine





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, either by fast and easy underwater maintenance or high-pressure cleaning in drydock.

ECOSPEED®

SHIP HULL PERFORMANCE TECHNOLOGY

Editorial

In this magazine we cover a wide range of topics related to our durable, non-toxic coating systems. These articles illustrate how we are using our products to work towards our goal of clean rivers, seas and oceans.

We start off with a list of major problems the shipping industry is facing. With our coating systems ship owners can be done with these issues forever.

Next we talk about how Ecospeed fits in seamlessly with scrubber systems. Ecospeed will protect these for the lifetime of the vessel.

As you can read in the last article, Ecospeed is ideally suited for ships during lay-ups because of its impermeability. Despite the aggressive nature of certain types of fouling, no rust or damage to the steel will be present on the underwater hull of the vessel after cleaning.

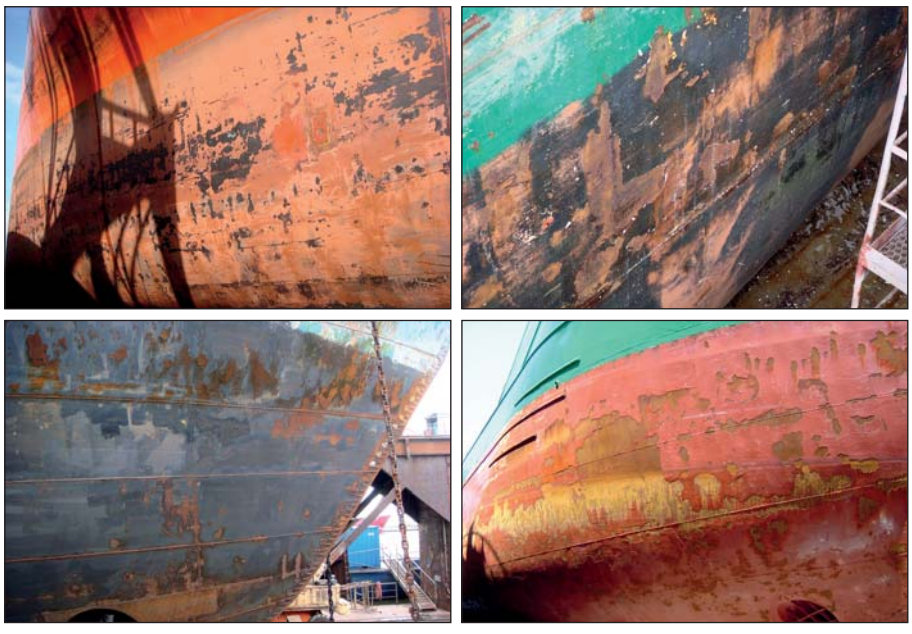
Subsea Industries NV
Boud Van Rompay
Founder

All major issues solved

Ship hulls coated with Ecospeed keep their sacrificial anodes intact. As a result they are no longer needed.

Our technology has solved all major problems relating to ship hull performance and protection.

We have succeeded in providing a massive breakthrough in the field of underwater ship hull performance and protection. We have done this with a combination of our line of environmentally safe coating products and a profound knowledge of underwater maintenance work and tools. The result is a substantial reduction in fuel consumption, virtually zero emission and huge time and cost savings during newbuilding and drydocking.



The effect of corrosion can be devastating if the wrong protection is used for an underwater hull.


Ecospeed coating on a cruise vessel after 6 years, seen here in drydock and in water.

1. Optimized surface friction

By optimizing surface roughness to its upper limits without future deterioration or degradation, we solved the problem of hull surface friction. As the coating has a lifetime equivalent to that of the ship, its surface characteristics are maintained over the same period.

2. Fuel savings

By optimizing hull surface friction and using the best possible surface hydrodynamic characteristics, proven fuel savings over the lifetime of the ship are most often found to be in the 20-40 % range. In contrast with AF compounds that rapidly degrade over time, our coatings last. Therefore the performance of the ship does not degrade either.

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

3. Corrosion

We have reduced the corrosion problem to a zero effect. Ship hulls handled by us keep their sacrificial anodes 100% intact, even after prolonged periods of 5-10 years in the water. Corrosion is virtually absent on our hulls and anodes are no longer needed.

4. Cavitation erosion

Cavitation erosion and corrosion thus caused is entirely solved. Cavitation erosion damage resulting in often very expensive repairs and time loss in drydock can now be avoided entirely. 500 rudders have been protected so far with a 100% success rate over a 15 year period.

Application of our coating systems is fast, flexible and easy.

5. Anti-fouling toxic particles emissions

Yearly 1 million tons of AF toxic chemicals and heavy metals are being used and lost at sea. This extremely damaging pollution results in billions of silt and sediment remedial cost. All of this can now become a thing of the past entirely, including the cost of removal.

6. Repeated application of degraded AF coatings

This is now an obsolete routine as our coatings last the lifetime of the ship. Peak distribution of toxic materials caused by repeated applications in drydock and thus emissions in ports and rivers has been overcome.

7. Time and effort in drydock

As reapplication is never necessary, work and time in drydock can be more than halved. Planning for work in drydock can be made to be very precise as paint renewal is avoided. Only small touch-ups may be needed. Waiting for acceptable weather is no longer necessary. This allows drydock companies to deliver on time. As a result, more ships can be docked in the same period.

Many case studies have shown that our coatings can withstand the impact of ice for many years on end.

Cleaning of our coating systems is 100% environmentally safe and can be carried out without damaging the coating.

8. Transfer of invasive species

This has become a totally manageable and cost-effective method and poses no major problems other than the repeated cleaning in-situ of the ship hull. This process is 100% environmentally safe. Even when done frequently, its cost is dwarfed by the fuel savings thus realized. Mitigation of the transfer of invasive species and very large fuel savings, never obtained before, are achieved by the same method i.e. regular in-situ underwater cleaning or other sanitation technologies.

9. Building costs

Cost for new building ships is substantially reduced as the repairs of these homogenous coatings, easy to apply and repair, are many times more efficient. This results in thousands of man hours saved during the building process. The reapplication of AF paint for speed trials in drydock at the end of the building period is not necessary any longer as a simple underwater hull cleaning is sufficient. The latter saves more than the total cost of the coating material supplied and the ship's speed is guaranteed.

10. Financial

As the coatings will last the lifetime of the ship, they are now part of the investment. Other accounting and financial rules can be applied than if it were a simple repetitive application and therefore returning cost. The cost of repeated application of chemicals has changed into a fixed asset, entirely part of the ship.

11. Ice-going and icebreaking ships

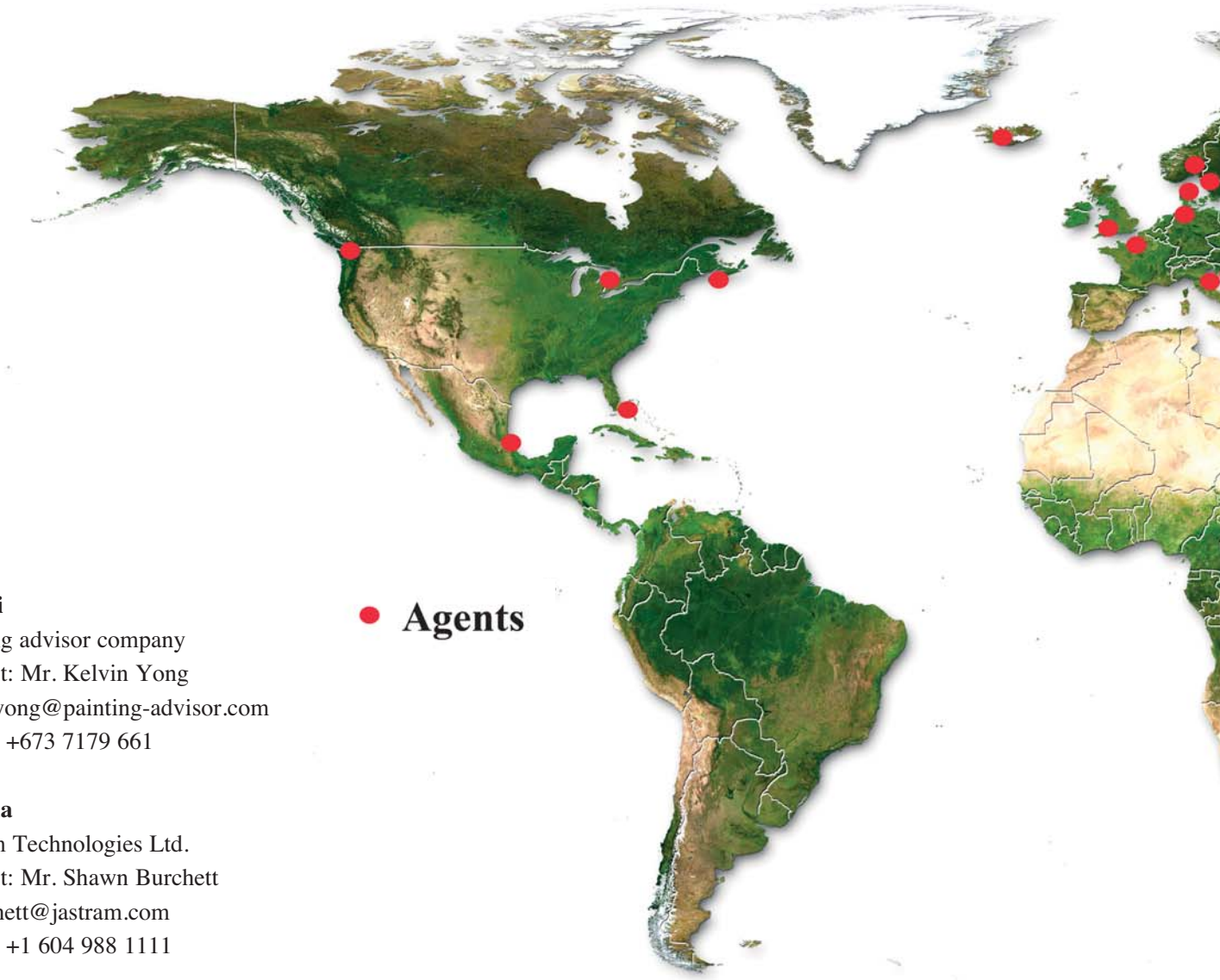
RRS Ernest Shackleton, RRS James Clark Ross and *HMS Protector*, all of British Antarctic Survey, have been coated with our products with great and conclusive results. Our coatings have also been selected for the newbuild research vessel *RRS Sir David Attenborough*, the biggest commercial shipbuilding contract in Britain for 30 years. Another 150 applications on ice going hulls have shown that our coating can withstand the impact of ice for many years on end, proving its superior strength and durability.

Summary

We have optimized hull surface roughness and hence hull friction resulting in fuel savings in the 20-40% range. We have cracked all major problems in corrosion and cavitation erosion. We have halted all anti-fouling toxic emissions. We have substantially reduced the cost and time of drydocking and its peak distribution of toxic particles due to repainting work. We have provided the most adequate solution to mitigate the transfer of invasive species. We have reduced new building costs. We have formulated the best way to prevent loss of coating in ice and general arctic conditions. ■

ECOSPEED®
SHIP HULL PERFORMANCE TECHNOLOGY

Worldwide net



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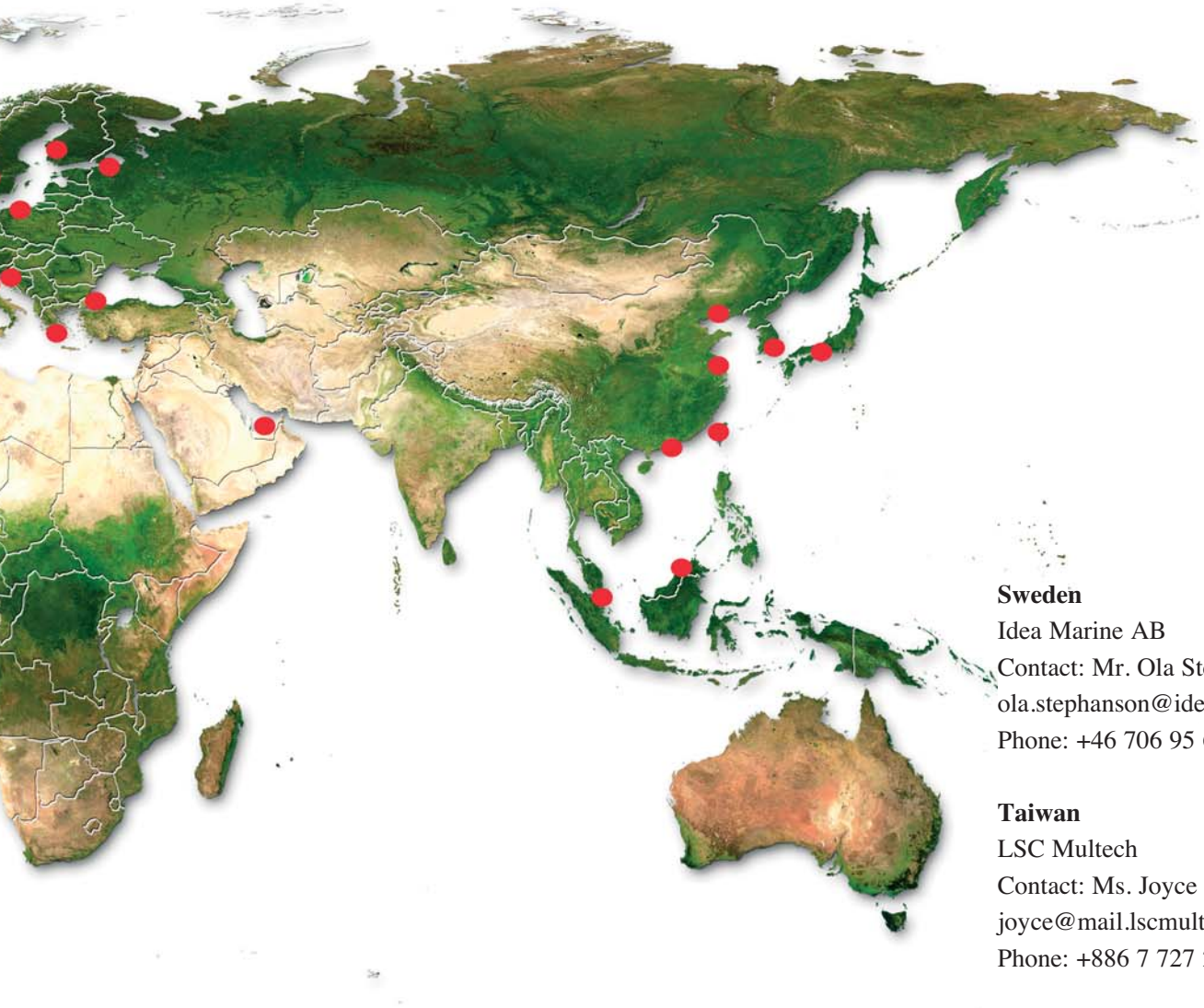

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Ecospeed application on exhaust scrubbers or outlets offers lasting protection

Because of the tight regulations on emissions in the shipping industry, the installation of an exhaust scrubber system becomes increasingly widespread. A durable coating to protect the inside of these scrubbers as well as their outlets is needed.

Exhaust scrubbers are systems that filter out all harmful toxins from exhaust gasses of marine diesel engines. This scrubber removes nitrogen oxides, sulfur oxides, hydrocarbons, heavy metals, carbon monoxide, soot and ashes. No pollutants are discharged into air. This minimizes the environmental footprint and impact of navigation in ports and coastal areas.

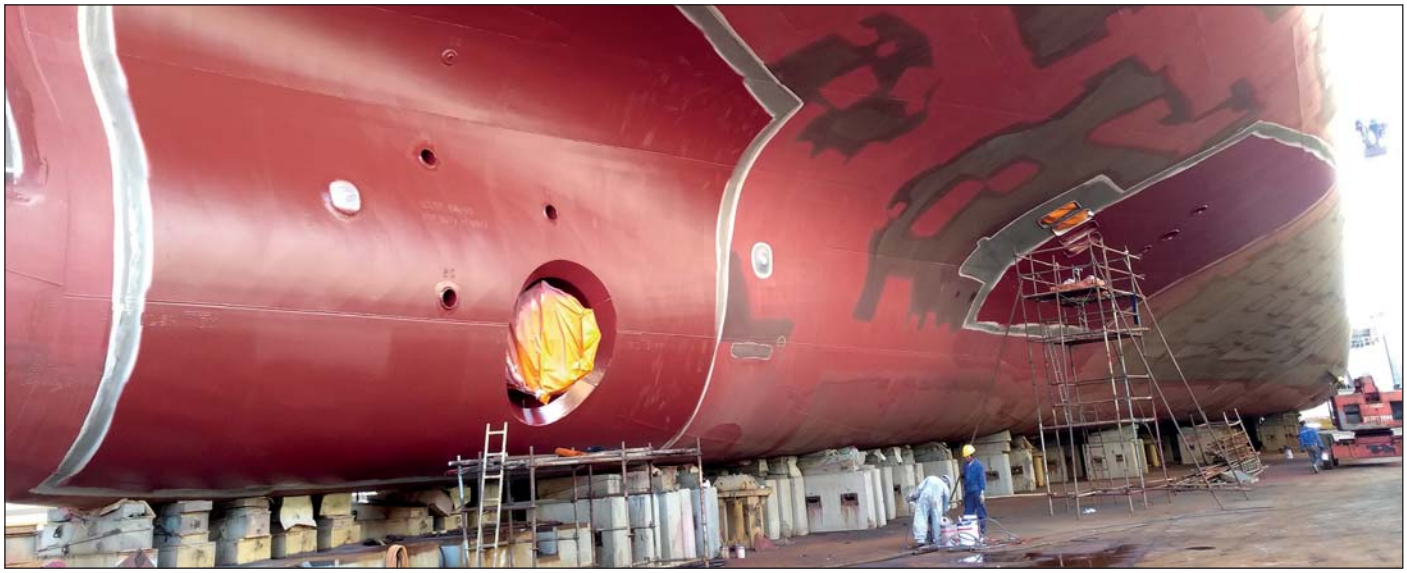
Application of first of only two layers of Ecospeed.

Inspection of the scrubber outlet area after first layer.

Several benefits make Ecospeed the perfect choice as coating for the exterior outlets as well as the interiors of the scrubber.

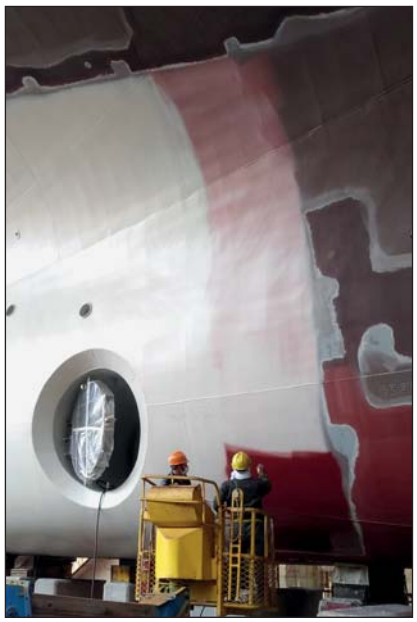
1. The coating system is highly chemically resistant. Taking into account the nature of the process taking place inside the scrubber, this is essential for our customers.
2. Ecospeed lasts the lifetime of a vessel. No repaints will need to be scheduled during future dockings of the ship. This saves on time and money.
3. We have been given a B1 classification by DNV GL after testing the coating's suitability as a ballast tank coating. B1 is the superior grade in a six grade classification system.
4. It is a TBT-free, copper-free and biocide-free solution. Independent

Ecospeed will protect the area around the outlets for the ship's entire lifetime.



The outlets of both scrubbers of these container vessels were given the same lasting protection.

Application of Ecospeed on interior of scrubber system.



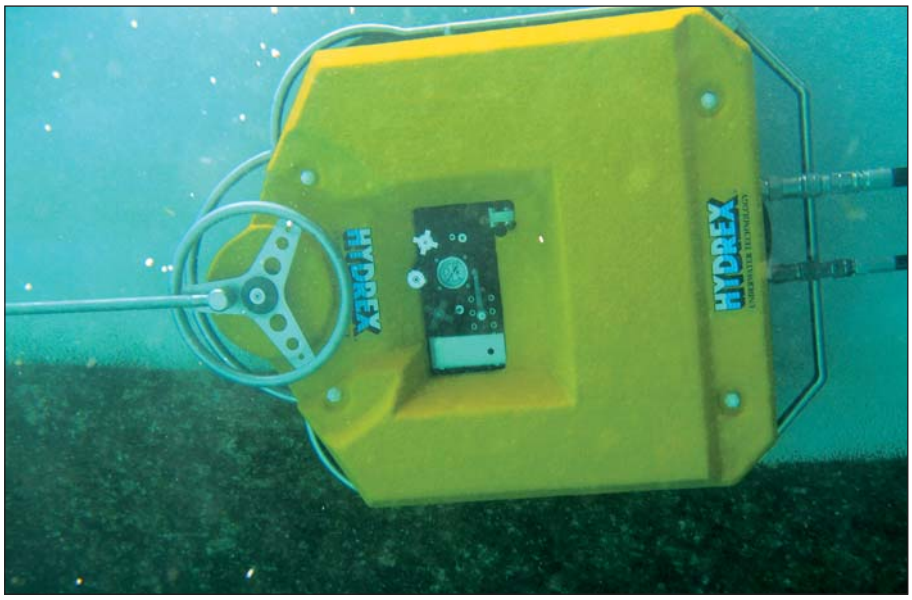
The second layer can be applied as soon as 3 hours after the first.

research has proven that the coating is 100% toxin-free and that there is no negative effect on the water quality or the marine environment at any point of its application or use.

Ecospeed fits in seamlessly with the environmental idea behind scrubber systems. It is a lasting, chemically resistant coating that will withstand the hazardous pollutants and protect the scrubbers for the lifetime of the vessel. ■

Ecospeed, the coating for ultra long lay-ups

As a consequence of the current economic climate, more and more ship owners are forced to lay one or more of their ships up for longer periods. This has, however, no adverse effect on an Ecospeed coating which can always be restored to its optimum condition, regardless of how much fouling has attached itself to the hull while the vessel has been laying idle.

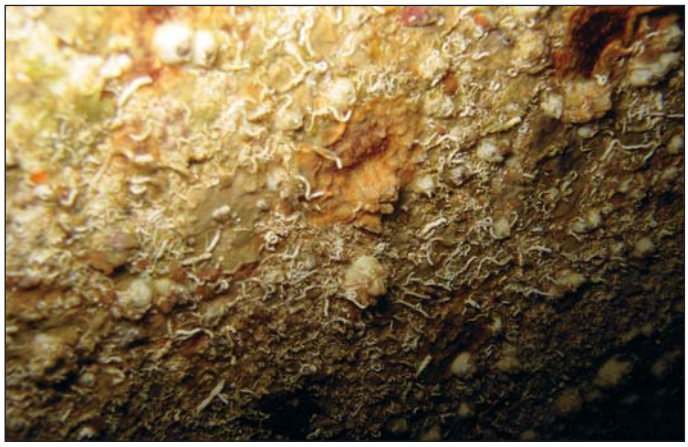


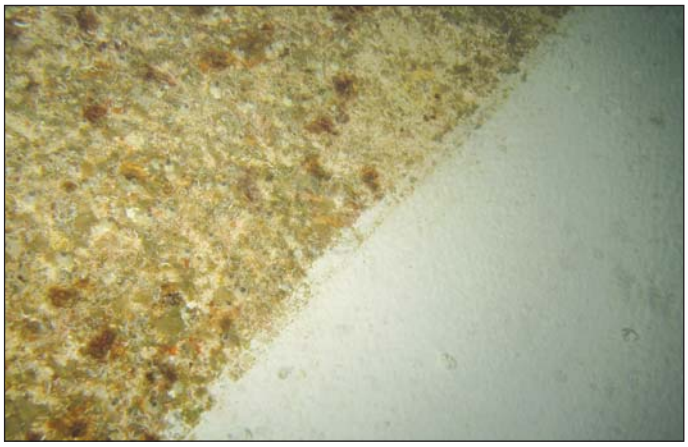
Even after long stationary periods the underwater hull of a vessel coated with Ecospeed can easily be cleaned underwater with divers or diverless systems.

Ecospeed is ideally suited for ships during lay-ups because of its impermeability. This gives the coating its excellent and durable anticorrosive properties and protects the underwater hull against damage caused by any type of marine fouling. Despite the aggressive nature of certain types of fouling, no rust or damage to the steel will be present on the underwater hull of the vessel after cleaning.

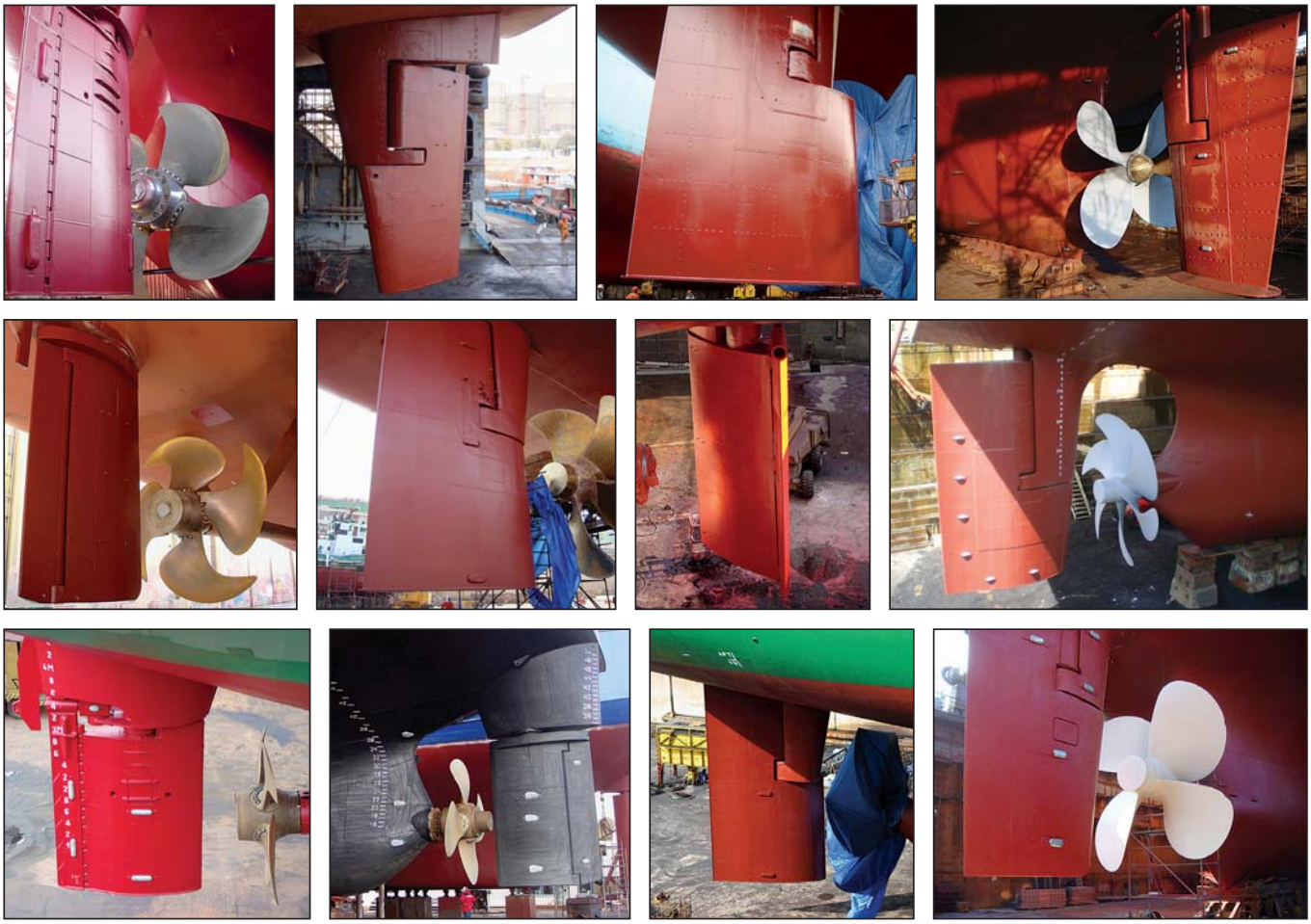
This is illustrated by a cruise ship that remained stationary in the Caribbean for seven months after it was coated with Ecospeed. After this period the coating's qualities allowed a complete removal of all fouling from the underwater hull of the vessel during an underwater cleaning without causing *any* damage to the underlying paint layers.

The coating's properties totally prevent fouling penetration, making the cleaning process extremely easy. It can be performed underwater or with controlled high pressure tools in drydock and can be repeated whenever needed during the vessel's lifespan without causing damage or deterioration in quality. The coating's surface characteristics even significantly improve with each underwater hull cleaning. This unique quality gives shipowners the opportunity to have their ship operational again and its hull restored to its optimum condition whenever needed without any additional financial setback.


Thick layer of fouling on cruise ship after laying idle in the Caribbean for seven months.


Fouling removal from cruise ship without damage to the Ecospeed coating.

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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ECOSHIELD®

THE DIAMOND STANDARD IN STEEL PROTECTION

SUBSEA INDUSTRIES






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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