ECOSPEED®

SHIP HULL PERFORMANCE TECHNOLOGY

Magazine

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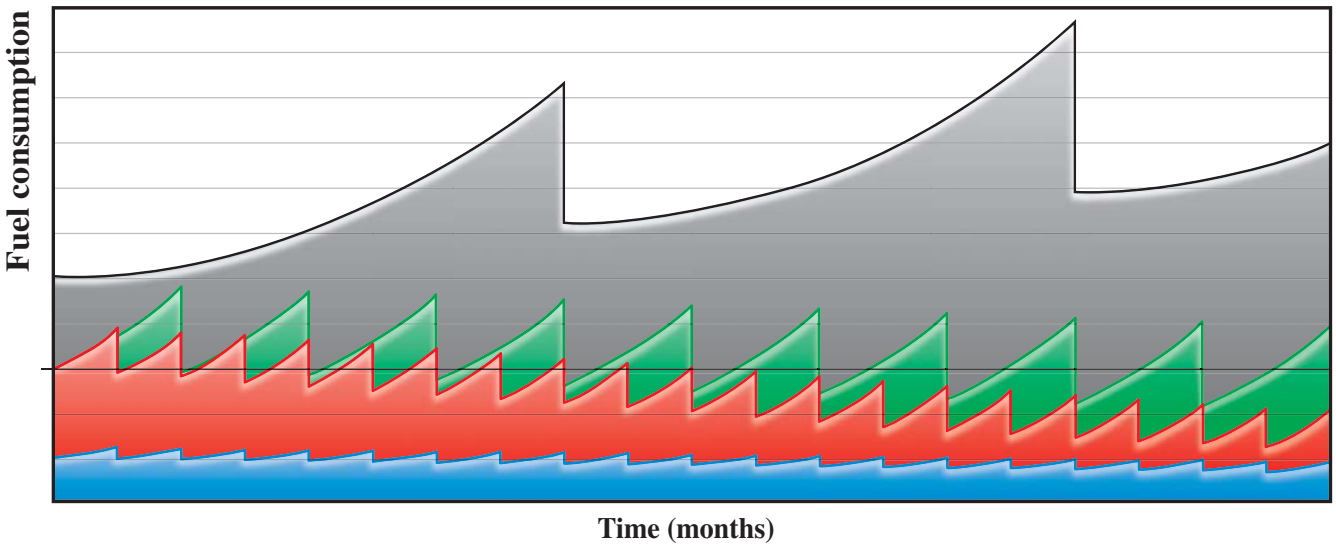
Millions in fuel savings

Development of additional fuel consumption over time



Ecospeed with 2 cleanings per year
Ecospeed with 4 cleanings per year
Ecospeed with optimum cleaning intervals
Active antifouling paints

Most ships sail with a chartering contract that includes a penalty clause if fixed distance/fuel consumption ratios are not met. However, this is unpredictable with regular paint systems and will also worsen over the years. The ship becomes more expensive and profits are reduced.

The protective Ecospeed ship hull performance technology however not only keeps the ship's performance stable but even improves it with repeated underwater maintenance. The coating is designed to be cleaned routinely with specially designed underwater hull cleaning tools. These simultaneously clean and improve the smoothness of the paint surface. This avoids penalties as well as producing enormous fuel savings.

One major cruise line has been quoted as saying that they are saving 10% on fuel costs with Ecospeed compared to the earlier TBT coating which they replaced. Another cruise ship found that they gained 1.5 knots over sea trials speed when they replaced their hull coating with Ecospeed.

Contact us to find out how Ecospeed can help you achieve major fuel savings.

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Fast and easy Ecospeed application offers many benefits for shipyards and shipowners

A lot has been written on the advantages of the Ecospeed underwater ship hull coating system. The coating offers many long term benefits to shipowners, ship managers and operators and this both from an economical as well as ecological point of view. The more practical and direct advantages of Ecospeed have been documented much less. In this article we take a closer look at how applying Ecospeed to a vessel can save much worry, time and hassle for superintendents and shipyards during drydockings, as well as save expenses for the owner.

An Ecospeed application is adapted to a ship yard's schedule.

Despite some supplier claims to the contrary, almost no underwater hull coating provides for the most basic objective which is to protect the steel from corrosion and prevent the hull from 'roughening' with age. When ships come into drydock, it is not uncommon to observe delamination of multiple paint layers. There is often also evidence of corrosion and hull roughening. Repairs of the underwater hull coating systems greater than 50 percent of the underwater area, and up to and including complete replacement of the hull coating, are not uncommon. This results in significant cost to the shipowners, both in terms of materials and labor, and in fuel costs due to the roughened conditions of the hulls and ultimately also in frequent required drydocking-time. So it's easy to see that the total cost of ownership (TCO) of a vessel would drop for a ship operating with a hull that is effectively protected.

Ecospeed is an extremely hard coating system with optimized hydrodynamics that can easily be maintained in service. This has a huge potential for reducing total cost of ownership of the vessel. When ships

After surface preparation, Ecospeed is applied in only two, identical, coats.

An Ecospeed coating inspector is present and available for the painters on every job.

The second (final) coat can be applied within a couple of hours or after a few weeks or even months.

come out of the water after lengthy periods, there is no delamination of the coating from the hull, there are no paint blisters that would be indicative of anti-corrosive failure, and the overall hull is still smooth. There are also the environmentally friendly aspects of the product. Studies done in the EU, by the Netherlands in particular, have determined that in-water cleaning of Ecospeed produces no materials that are toxic to the marine environment.

Ecoshield, a specifically reinforced version of Ecospeed can be used to protect thruster tunnels against cavitation and corrosion damage.

High quality application– the secret of long term durability

The reason for the pristine condition of the Ecospeed coating after several service years is very simple according to Mr. Gunnar Ackx, managing director of SCICON Worldwide, an independent coating inspection and consulting company.

As a coating inspector and consultant, Gunnar Ackx has had the opportunity to inspect and assist the very first Ecospeed application, just over ten years ago. “When I first saw the ship come out of the water prior to the Ecospeed application and noticed how banged up the hull was, my first reaction was: ‘This is never going to work.’ But that job certainly did prove me wrong. I have been amazed at Ecospeed’s performance ever since.”

To Mr. Ackx it is clear that the high quality of an Ecospeed application is key to the excellent results obtained with the coating. “We always advocate that surface preparation is the foundation of any coating system. So as soon as you start tampering with the quality of the surface preparation, you will tamper with the total quality, hence service life of ANY coating. A proverb that we often use during our inspection assignments is: ‘If you fail to prepare, prepare to fail’ which says a

Ecoshield’s flexibility enables absorption of the forces that are produced by cavitation, preventing damage.

By removing the existing paint layers and applying Ecoshield on rudders we can break the never ending cycle of painting and repainting.

Shipowners will not have to do any repainting beyond minor touch-ups during future drydockings.

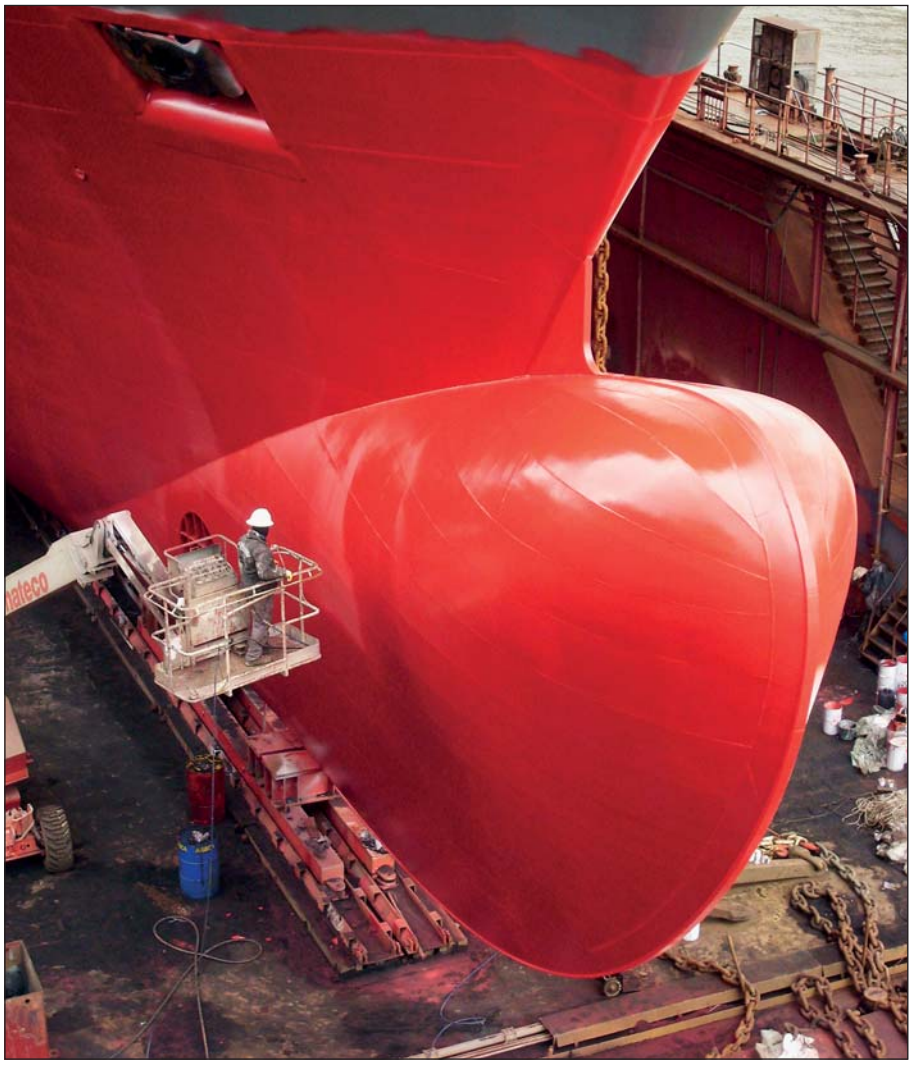
lot about the above. Once you have applied the 2-coat Ecospeed hull coating, you'll never have to reblast again, throughout the entire service life of the ship."

The importance of a quality standard during application cannot be overestimated. Ecospeed's manufacturrers have access to very extensive research in this field and especially regarding the decay or degradation of other paint systems over drydocking intervals. Most of the time the effect of this degradation of the paint system and the build up of paint layers on the fuel efficiency of the ship has been largely underestimated. Ideally, during a second special survey of a ship in drydock there are very substantial benefits in stripping away all the old paint; immediate fuel savings of up to 20-30% are very realistic numbers.

When the Ecospeed coating is applied correctly this build up of paint layers is ended forever. Any paint system is only as good as it is applied. For this reason at least one Ecospeed coating inspector is present and available for the painters on every job. This is to check the conditions during the application process, but also to work closely with them to help ensure a very easy and smooth application. Because the inspectors are closely involved with the application, they know exactly what has happened during the coating process. This allows them to approve the 10 year warranty that comes with an Ecospeed application.

Ecospeed works with its own team of highly certified, highly qualified coating inspectors. These inspectors

(continued on page 8)



A two coat application is always going to be quicker, cheaper and more flexible compared to other systems.

Why Ecospeed®?

Ultimate hull protection

Complete corrosion protection

- Hard, tough, glassflake-based
- Flexible, very strong adhesion, thick coating
- Impermeable and impenetrable

Long-lasting – one application lasts the life of the ship.
No reapplication needed, only minor touch-ups in drydock.

- 10-year extendable warranty

Cleanable in the water

Gets smoother with underwater hull cleaning

Ultimate protection for rudders and underwater gear

- Ecoshield – a very strong version of Ecospeed designed for rudders, bulbous bows and underwater gear, prevents cavitation and corrosion damage
- Protects rudders, stabilizer fins, bulbous bow (ice), thruster tunnels, nozzles and other underwater gear

Ice class coating (certified)

- Abrasion resistant
- Low friction
- Stays on when other coatings are removed by the ice

Protection for offshore, stationary vessels

Economic

Enormous fuel savings (10 - 25
AF and FR coating systems)

- A smooth hull
- No long term paint degra
- Becomes hydrodynamica routine cleaning
- AF and FR coatings typic 20 - 45% fuel penalty aft
- Easy to keep clean of fou slime at most)

Reapplication costs saved (no r

Drydock savings (fewer and sh need to repaint)

Ease of application

- Two homogeneous coats, tie coat or any other coat)
- 3 hour minimum overcoa
- No special environmental
- No special equipment nee

Easy and quick to repair in dry

Does not interfere with other w

Greatly reduced total ownershi

What is Ecospeed? Ecospeed is an underwater ship hull protection and fouling control system. It consists of a tough, long-lasting, glassflake reinforced coating combined with routine in-water cleaning/conditioning. One application lasts the life of the hull. It does not degrade but becomes smoother over time with regular in-water cleaning. It can be used on any ship or submerged structure, steel, aluminum or GRP. It has the potential of great financial savings. It is designed with environmental protection in mind and is entirely environmentally safe.

al benefits

% compared to conventional

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er 10 - 15 years
uling (can be kept to a light

eapplication needed)

orter drydockings since no

500µm each, no primer, midcoat,
)
t time, no maximum
l requirements
eded

ydock

ork in drydock

p cost

Environmental benefits

Reduced GHG

- Smoother hull = lower fuel consumption = reduced emissions

No toxic emissions to environment

- No heavy metals such as copper, zinc, tin
- No co-biocides such as Irgarol, Diuron and others

No contamination of water column or sediment

No harmful effects on non-target marine life

Prevents hull-borne invasive aquatic species spread

- Ships sail with clean hull, potential invasive species removed

Very low VOCs

Can be cleaned in the water safely

- No damage to coating
- No harm to environment

No repeat application, no cumulative environmental impact from preparation and application

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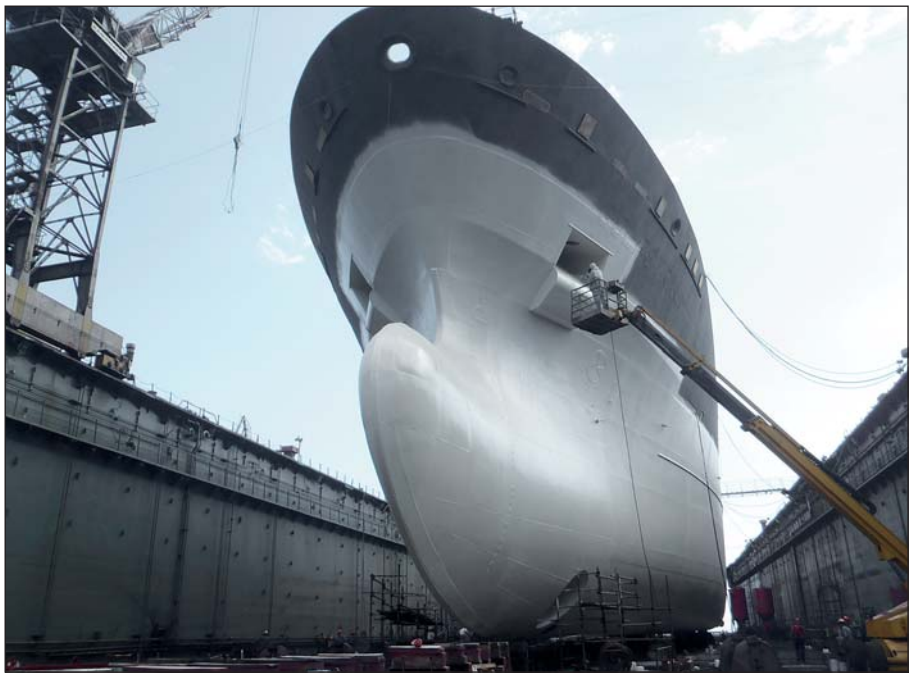

The high standard that Hydrex demands for an Ecospeed application does not mean that learning to work with the coating is a difficult process.

have been working with the company for many years. They are not only familiar with Ecospeed, but with a wide variety of other coating systems. They are also very important in terms of cooperation with the shipyard, making sure that the product is applied according to the required standards and thus that the results will be there for the shipowner for the next ten years and beyond.

Cost of application and maintenance in relation to total cost of ownership

If an owner really has problems with the cost of such surface preparation, Gunnar usually sits down with them to do the math on the alternatives. "If you reapply 2, 3 to 4 layers of antifouling coating on the entire hull and are re-doing the above every 3 to 5 years, you inevitably come to a point where there are too many layers of coating on the ship's hull." Gunnar then tells them that, "This will degrade the quality of the coating even more easily and rapidly because of the internal stresses being built up in the coating, resulting in a required full reblast, probably every 10 years or so." He recalls a drydocking of a large cruise vessel where some 2.0 to 2.5 mm thick old coating system was removed completely. "It probably consisted of up to 15 or more layers, which were continuously flaking off here and there and were patch-repaired for a number of years. If you make such a calculation over, say, a 25-year service life and compare that with the initial cost of the Ecospeed application combined with the very minimal maintenance it requires, it doesn't take a rocket scientist to figure out which is more economical. And that is not even taking into account possible reduced drydocking times and fuel savings because of some other characteristics of the Ecospeed hull coating."

Ecospeed can be cleaned underwater or with high pressure tools in drydock without damaging the coating.

Flexible and easy to learn application process

The high standard that are demanded for an Ecospeed application does not mean that learning to work with the coating is a difficult process nor that the application itself is hard to schedule or carry out.

Applying Ecospeed is quite straightforward. Common sense needs to be used with every single coating application. There are stricter guidelines on the pot life and the thorough cleaning of equipment, but in general it paints like any other paint. Most applicators are quite familiar with hard solid paints and they know the tricks of the trade. Mr. Ackx confirms this. "Our inspectors have inspected over 125 Ecospeed jobs

Ecoshield offers lasting protection against corrosion and erosion damage.

and every time the specifications were followed by the coating contractor, the application went very well and smoothly."

The Ecospeed coating also offers a tremendous flexibility to the shipyard. The minimum overcoating time is three to four hours, which means that, for smaller surfaces such as rudders, propellers or bow thrusters, the two coats required can often be applied in one single day. "If blasting is done overnight and approved during a morning inspection, the object to be coated can be ready by nightfall." Mr. Ackx tell us. "As the coating inspector, you rarely come in at the exact right time when the yard is ready to start blasting and/or coating. Especially during drydockings, there is a lot more going on than just the hull coating, which can easily interfere with the planning of your project. Because of the fact that Ecospeed consists of only 2 coats and has quick and flexible overcoating times, this often allows the Ecospeed job to be scheduled around other work taking place, resulting in minimal interference among various activities."

Ecospeed only requires two layers of 500 µm each. This is also a major advantage compared with other hull coatings. "Whether you're looking at classic antifouling coating systems which easily have five or more coating layers to be applied, or when comparing Ecospeed to some of the newer silicone based hull coatings, which also consist of four to five layers of coating to be applied, a two coat application is always going to be quicker, cheaper and more flexible," Gunnar Ackx explains.

The coating schedule can be adapted to that of the yard and it does not have to be the other way around. A traditional paint application schedule is defined by surface preparation and by the weather conditions, which are difficult to predict. In this respect the application of Ecospeed is easier to adapt to the application windows that become available. You can apply the coating quite rapidly on a prepared surface and the possible overcoat time ranges from three hours to very extended periods of time. Depending on whatever suits the owners' or the shipyard's schedule the second (final) coat can be applied within a couple of hours or after a few weeks or even months.

Easier to plan drydockings for the rest of the vessel's service life

The durability of Ecospeed makes the planning of future drydockings far easier for the shipowner and the shipyard. Shipowners will not have to do any repainting beyond minor touch-ups, if needed. These can easily be done during a short drydock visit, which is in contrast to the full renewal of paint layers that is needed with other paint systems. Ecospeed is a coating system that lasts the lifetime of the vessel; the initial application is therefore critical for the success of the coating.

Mr. Ackx confirms that if a ship coated with Ecospeed comes into drydock after some years of service, the planning of this docking is so much simpler than with vessels

Ecospeed is applied in only two layers, allowing a very swift and flexible application schedule.

coated with other underwater hull paint systems. "I have had the opportunity of witnessing the drydocking of a number of vessels, with different types of hull coatings. With classic antifoulings, most people in the shipping industry know what's happening: the antifouling has to be renewed every three to five years, maximum, during which there will also easily be five, ten or more percent of corrosion present on the underwater hull, which requires spot blasting and touch-up as well. After a couple of recoating cycles, the total coating system becomes increasingly weaker, resulting in more repairs and maintenance that needs to be done with every drydocking and this up to the point where the entire underwater hull needs to be fully reblasted."

The amount of time many ships spend in drydock is directly related to (re)painting the underwater hull. When repainting the underwater hull can be taken out of the equation for the choice of location and season for drydocking, then the story becomes a lot easier for superintendents, for the shipyards, for everybody involved.

Easy and environmentally friendly fouling removal

The standard procedure for shipyards when a ship enters drydock is a general wash down of the ship hull to clear away any fouling and residues, especially salt residues that may adhere to the coating system. With Ecospeed the coating is always in a brand new, excellent condition after the high pressure washing. The surface texture is very smooth. The high pressure washing reveals without exception that Ecospeed does not need any additional paint layers. There is also a very big difference between cleaning Ecospeed and other paints. When washing an antifouling paint in drydock, everything on the bottom of the drydock is discolored with dirty red water filled with toxins, and the antifouling paint spreads everywhere on the bottom of the drydock. With Ecospeed, none of the paint material is lost. It's clean water that you see. 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.

Summary

We hope that this article has helped communicate the practical aspects of applying Ecospeed, the differences between Ecospeed and other underwater hull coatings, and the low cost-to-savings ratio that can be obtained by using Ecospeed to protect the underwater hull of any vessel afloat today. ■

Hydrex White Paper No.14: Hull Protection for Ice-going Vessels

Tackling the special coating requirements of the hulls and running gear of ice-going vessels

Ice is certainly not the ship hull's best friend. Ice-laden waters are perhaps the harshest marine environment for ships. More than in any other marine application, choices regarding ships that will sail in ice can be a matter of life or death.

Yet with Arctic ship routes opening up, an IMO Polar Code in the making, offshore exploration in icy waters increasing, concerns about polluting relatively pristine areas, and a number of related factors, the subject of fitting ships for the ice and protecting their hulls is topical and important.

Hydrex White Paper 14, Hull Protection for Ice-going Vessels, digs in on the subject of why ice is such a nemesis for ships' hulls. It looks at how exactly it affects them and examines best available practices and options for protecting the hulls and running gear of ice-going vessels. It contains information which is vital to anyone responsible for choosing and applying hull coatings for icebreakers and ice-going ships.

Like all our White Papers, Hydrex White Paper No. 14 is available for download in its entirety at www.shiphullperformance.org free of charge. ■

Save millions in drydock expenses and off-hire time

Hull of cruise ship after 5 years with Ecospeed coating with no replacement or major repair. This is the state of the hull when the ship came out of the water, without any cleaning or touch-up in drydock.

When your hull coating never needs replacing or major repair, you can save a lot of money in drydock fees, off-hire time, materials and labor.

Most hull topcoats are designed to be replaced once or twice every five years. The full hull coating scheme has to be fully replaced every 10 - 15 years down to bare steel. Over that time period, the coating degrades and becomes rougher until it's no longer worth trying to patch it up. And it costs you a fortune in fuel to compensate for the additional hull friction.

Imagine a coating that's guaranteed for 10 years and is expected to last 25 without replacement or major repair. A coating that gets smoother over time, not rougher.

Imagine coming into drydock after 3 or 5 years and finding that your hull coating only requires a few minor touch-ups and doesn't even need to be washed off.

Just think how much money you will save.

Call us today for a quote to convert your hull to Ecospeed or start off right, with Ecospeed, on a new build.

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