

ECOSPEED®

SHIP HULL PERFORMANCE TECHNOLOGY



Ecospeed offers lasting underwater hull protection to vessels trading in ice.....	3
Recent conferences and presentations	8

Contents

Page 3 - 7

Ecospeed offers lasting underwater hull protection to vessels trading in ice

Page 8 - 10

Recent conferences and presentations



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The only coating that gives your engine a break

Ecospeed provides your vessel with long-term protection and dramatically improves the ship's performance.

An impermeable and extremely tough coating is combined with an underwater cleaning system. This keeps the hull roughness at an optimum level and results in a

major saving in fuel.

Ecospeed gives a very thorough and lasting defense against cavitation and corrosion damage for a ship hull's entire service life. The coating comes with a ten year guarantee. No repaint will be needed during future drydockings.

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Ecospeed offers lasting underwater hull protection to vessels trading in ice

When it comes to protecting the hulls of ice-going vessels, the glassflake reinforced surface treated composite (STC) Ecospeed® has proven to be remarkably durable, typically outperforming many specialized ice class paints. The fact that the coating is non-toxic is also particularly important for ice trading vessels where toxic AF coatings are rapidly scraped off and deposit their toxic ingredients in what are often particularly sensitive environments.

Icebreakers and ships that trade in icy waters have their own very specific problems when it comes to protecting their underwater hull. Icebreakers have to use their weight to ram into thick ice and force a passage. Ice going ships, such as those trading in the North Baltic, the northern coasts of North America, the Great Lakes, and so on, are constantly being hit by chunks of ice which may be 50 centimeters or more in thickness. Not only is the ice highly abrasive, there is the addi-



Ecospeed protects icebreaker while it crushes thick layers of polar ice

tional factor that the steel of the hull flexes under the impact. When the metal sheets that form the hull flex and bend under collision with the ice, the paint that is supposed to protect them does one of two things. It either is flexible and adheres so well to the metal that it is virtually part of the steel itself and thus survives, or it is less flexible than the hull and cannot flex with the steel, in which case the paint gradually, or not so gradually, is disbonded from the hull and rubbed away under the impact. It is a problem which is unique to ships faced with ice impact.

Ecospeed demonstrates excellent attachment to the hull and successful resistance to extremely icy conditions. Ecospeed has proven its ability to withstand the harshest winter conditions on numerous occasions. For over seven years a number of vessels coated with Ecospeed have been sailing the most northern parts

of the Baltic Sea during the winter season and as far as both the North and the South Pole. These vessels' underwater hulls frequently have to endure the impact of large pieces of floating dry ice. Despite this, there has been neither damage from the ice nor any deterioration of the coating and none of these vessels have required more than just a few touch-ups during their drydock visits.

Certified abrasive resistant coating

Ecospeed has received the Lloyd's Register certificate that recognizes the coating as an abrasion resistant ice coating. This allows owners of vessels intending to navigate in ice conditions to reduce the thickness of the plating of the ice belt, the area on the bow just above the waterline that is most prone to mechanical damage from sailing through ice, if this area is coated with Ecospeed.



Comparative ice-strength paint on the left, Ecospeed patch on the right.

Some cases in point - No repaint needed during drydockings

Interscan cargo fleet benefits from Ecospeed

Interscan Schifffahrt controls a fleet of 23 container and multipurpose cargo ships ranging in size from 1,723 to 11,800 dwt. Many of these vessels trade in northern Europe, generally in the Baltic.

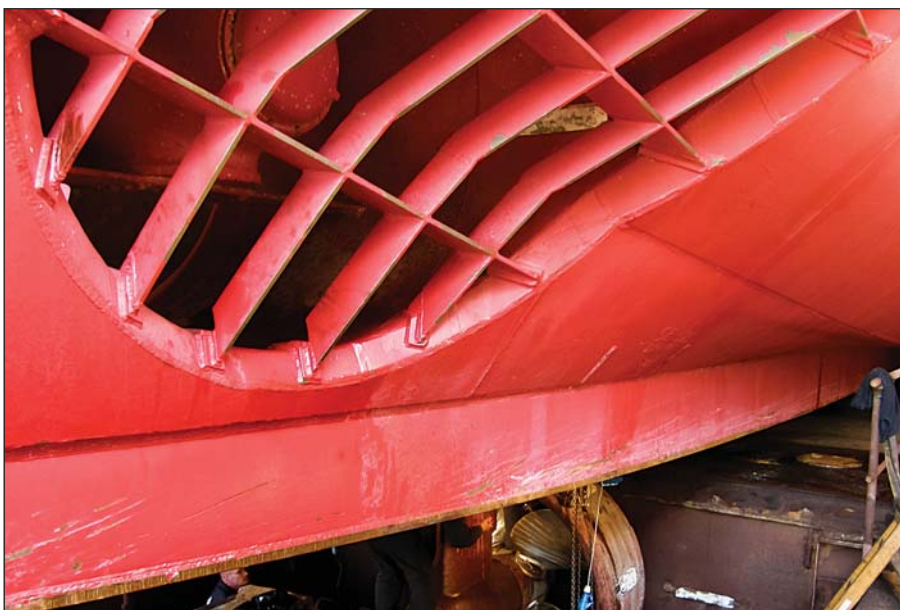
Until 2005, all those ships trading in



Only touch ups required on ice-going general cargo vessel after 5 Baltic winters with Ecospeed



RRS Ernest Shackleton in Antarctic ice up to 2.5 m thick.



Examples of the minor scrapes and chips which were the totality of the damage to the Ecospeed coated hull after two seasons in the ice.

ice in the Baltic region went through a cycle of having all their bottom paint scraped off by the ice each winter and having to drydock and repaint every spring. The paint used was a standard epoxy coating.

In 2005 the then superintendent engineer came across Ecospeed. He decided to test the environmental and fuel saving benefits of Ecospeed, a novel, environmentally-benign, hard coating system. *MV Patriot* was their first ship coated. The *Patriot* is an 82.3-meter ice class E2/Finnish 1B general cargo vessel. According to Michael Tensing, in charge of chartering at Interscan, the ship was in need of a full reblast at the time due to the built up of multiple layers of epoxy, so the time was right to prepare the hull fully and try Ecospeed.

It is now seven years since Ecospeed was applied on the first Interscan vessel. Michael Tensing says, "She was here recently and the paint still looks good. That's the best advertisement you can have. You don't have to do much to the paint. It's only a can of paint for touch-ups, just cosmetics at the anchor pocket or if you have mechanical damage or something. The rest to my mind is



MV Patriot in drydock in 2005, prior to blasting and Ecospeed application.

really very good.” As he points out, there really is no other coating that could stand up to seven years of trading in ice and still remain intact and not in any need of repainting or anything beyond very minor touch-ups.

Michael Tensing estimates that at current rates the payback for full hull preparation and coating with Ecospeed for a newbuild would be five years. Since Ecospeed properly applied is guaranteed for ten years and expected to last the full life of

the ship, the economic factors are very positive. And these figures only take into account the cost of preparation, paint and application, compared to the conventional coatings they were using, without regard to potential fuel savings from correct use of Ecospeed. All the Interscan Ecospeed coated vessels will soon have exceeded the payback period. So far all the ships have kept their coating in excellent condition.

W&R Shipping finds Ecospeed to be the best coating

W&R Shipping converted its existing fleet to Ecospeed and specified Ecospeed as the coating for newbuilds ordered. Co-founder Captain Wim van Ecke explains why.

Wim van Eck has spent most of his seafaring career as a captain, trading mainly in the North of Europe and the Baltic Sea. “Of course we always were confronted with the fact that in the winter time when you were sailing through the ice your paint was gone and so you had to do



W&R general purpose vessel Crown Mary sailing in ice thick enough to walk on.



Crownbreeze in drydock in 2009 showing condition of paint after two years in ice.

something about it in the summer time,” he explains. “You had to dry-dock in order to repaint.”

In 2007, Wim came across Ecospeed. Having read of the success Interscan was having with Ecospeed on similar vessels, also trading in Baltic and Northern European ice every winter, W&R decided to try Ecospeed themselves.

The first vessel to be converted to Ecospeed was the *Crownbreeze*. Like the other W&R vessels, the *Crownbreeze* previously had a high abrasive specialty ice coating. “I can’t say that the earlier coating worked very well,” says Wim. “When it was new it was not too bad, but of course you get a lot more chipping than with Ecospeed, so

every docking you have to touch it up and it gets rougher.”

The *Thea Marieke* followed in the wake of the *Crownbreeze* with an Ecospeed application in 2008. Those were the two where the original coating was replaced. Subsequently, the *Crown Mary*, the *Tina* and the *Anna Dorte* also had Ecospeed applied at newbuild stage which is the ideal time to apply the coating.

The *Crown Mary* went to drydock in June 2012 after two and a half years’ sailing in ice with Ecospeed. “There was some small mechanical damage but nothing really major,” says Wim. “We didn’t need to do anything with the hull paint in drydock.” The *Crownbreeze* was docked in 2009 and again in 2012, five years after

the Ecospeed was applied. Nothing had been done with the paint in the 2009 drydocking.

Wim also points out, “Having Ecospeed on the hull can save us some days in drydock which would be needed to repaint if we were using a less durable coating.”

Icebreaker *Oden* – Conquering the Poles with Ecospeed

This icebreaker *Oden* came in to drydock in Landskrona, Sweden, in April 2009 after sailing with Ecospeed on parts of its underwater hull for two years. During this period it was used for several expeditions to both the Arctic and Antarctic.

After Ecospeed came out on top in a

comparison between test patches coated with Ecospeed and another ice-strength paint, the management of the vessel was more than happy to have the rest of the underwater hull coated as well and also ordered the same treatment for fellow icebreaker, *Ymer*.

The *Oden's* Captain, Erik Andersson, recalls the problem with hull protection prior to 2007. "When the *Oden* went down to Antarctica the first year, we found that ice-breaking was quite different down there, especially when you get close to the coastline where there is a lot of lava sand in the ice which makes it more or less like sandpaper. Also the ice is extremely hard in those areas. Due to that fact, the first year the icebreaker paint we were using was almost all more or less destroyed on the bow area so we were left with virtually unprotected steel."

"We've had Ecospeed on the bow for a couple of years now," continues Erik Andersson, "And it's still there. It gets thinner and you can see that it's actually shaving and getting thinner, but it's still providing protection for the steel, whereas the conventional ice strength paint we were using would probably be gone by now."

RRS *Ernest Shackleton* - a breakthrough in icebreaker hull protection

When British Antarctic Survey's RRS (Royal Research Ship) *Ernest Shackleton* was drydocked in Denmark, the superintendent, engineers and paint specialists there to check the condition of the hull paint were amazed. After two seasons of battering its way through ice up to 2.5 meters thick with a high content of gravel and volcanic lava adding to

its abrasiveness, the hull coating was virtually intact and undamaged. This was in strong contrast to the *Shackleton's* previous drydocking, when almost the entire hull, bearing a conventional ice-going underwater hull coating, was practically stripped to bare, unprotected steel.

The difference lay in the fact that when the *Shackleton* left drydock in 2009, the hull was newly coated with Ecospeed. Even though Ecospeed is not intended specifically for ice-going ships and icebreakers, it consistently outperforms the specialized ice-going ship bottom paints.

Stephen Lee was the Senior Marine Engineer for British Antarctic Survey, the BAS's equivalent of a Technical Superintendent. He recalls the reaction of those present when the *Ernest Shackleton* was first pulled out of the water at Frederikshaven drydock in early 2011 "The biggest thing was the surprise at seeing the areas where you'd expect it to have taken a lot of damage... when she first came out of the water and onto the blocks it was a complete shock to all those present. All of us there commented on the condition of the hull and in particular that there was negligible damage at the bows, merely some scratch marks. None of us there would have predicted this. I then jokingly asked the question, 'Are you sure you've taken this ship to the ice?'" According to Stephen Lee, the crew of the *Shackleton* reported that they had been pushing into 2 - 2.5 meter thick ice, "...and it's just not touched it - just not it at all."

Paint inspector's perspective

Howard Jess was the paint inspector for the initial Ecospeed application

to the *Ernest Shackleton* in 2009. "I was very impressed with the condition of the coating on the *Shackleton* after two seasons in the ice," says Howard. "Apparently she had been trapped in the ice on several occasions and the procedure is to reverse and then crash forward at full speed. Yet the coating remained intact - pretty impressive. I would have expected to see damage down through the coating exposing the hull. However the bow looked as if it had just been painted. Crew members who had seen the ship out of the water on numerous occasions said that they had never seen the hull looking so good after two seasons in the ice."

Howard also has some advice for shipowners applying Ecospeed to their ice-going vessels: "For some reason the current mind-set is to stop at the waterline. Given that ice tends to ride over itself and up the hull it would seem sensible to extend the coating to 2-3 meters above the waterline." A piece of wisdom obviously shared by Stephen Lee, evidenced by the fact that while the *Shackleton* was in drydock recently, the level of Ecospeed coating was raised from the water line to well into the boot top area for protection.

Summary

Due to its unique composition, Ecospeed is not only the best protection available for underwater hulls of icebreakers and ice going vessels, the coating also provides the best hull performance and is the easiest ice going paint to apply and maintain. ■

**KEEPING SHIPS
IN BUSINESS**

Recent conferences and presentations

Over the last couple of months we have attended numerous exhibitions and conferences around the world, giving presentations on various topics or sitting on panels to discuss the future of sustainable shipping.

In this article you can read an account of two of the more recent conferences we took part in: the *Workshop on Biofouling Management for Sustainable Shipping* in Australia and the *Pacific Ballast Water Group meeting* in California. Besides these two conferences, we also took part in the *2nd Annual European Renewable energy* in London, *Green ship technology 2013* in Hamburg, the *World ocean Council* in Washington DC, the *9th Artic shipping forum* in Helsinki, *Green Tech 2013* in Vancouver, the *Hull Management and Performance* conference in London and many other events.



Australia/New Zealand/ Pacific Workshop on Biofouling Management for Sustainable Shipping Melbourne 5 - 9 May 2013

We attended the Workshop on Biofouling Management for Sustainable Shipping held in Melbourne, Australia May 5 - 9, 2013 which brought together some of the



Melbourne Convention Center where the Workshop on Biofouling Management for Sustainable Shipping took place.

world's leading scientists along with representatives of the IMO and a variety of government agencies in Australia, New Zealand and the Pacific states of the USA, plus representatives from industry, shipping and other organizations and groups all interested in the subject of ship hull fouling, its effect on fuel efficiency, its role in spreading aquatic invasive species and how best to manage it.

The New Zealand Environmental Protection Authority has completed a reassessment of biocides permitted in antifouling paint in New Zealand. Current recommendations are not final but include revoking approvals of Chlorothalonil and Irgarol 1051, phasing out three biocides currently in use, Diuron, Octhilione and Thiram over a four year period, and imposing additional controls on eight other biocides including copper. The full recommendations in their current form (at time of publication) can be found here:

http://www.epa.govt.nz/search-databases/HSNO%20Application%20Register%20Documents/APP201051_APP201051_Evaluation_and_Review_Final.pdf

The work done by New Zealand's EPA might well be embraced by the MEPC of the IMO with a view to expanding the list of harmful toxic substances which may not be used in antifouling paints per the AFS Convention and its Annex.

The workshop included many speakers on a wide variety of topics ranging from the state of regulatory action regarding antifouling paints and in-water cleaning to biosecurity in the ANZPAC area, new developments in underwater ship hull coatings and many other related topics.

Many speakers echoed the value of the principle of ships sailing with a clean hull, expressed by the phrase "clean before you go." The problems of trying to combine in-

water cleaning with the current crop of biocidal antifouling coatings and foul-release coatings was not, however, satisfactorily addressed.

It's not easy to summarize such a diverse set of subjects and speakers, but the overall impression was that the subjects of biodiversity and biosecurity in Australia, New Zealand and the Pacific are becoming more pressing, that current approaches to limiting the spread of invasive aquatic species without other harmful environmental effects are not adequate and that answers are being sought. Unfortunately the general acceptance of biocidal antifouling coatings as a necessary evil in dealing with the problem shows a lack

of information on and understanding of the alternative non-toxic approach in the form of surface treated composites and in-water cleaning of hulls, as described fully in the *Surface Treated Composites White Book* by Boud Van Rompay.

It was certainly encouraging to see that the subject of biofouling and the translocation of aquatic invasive species is receiving greater attention and also that at least in New Zealand, the harmful effects of biocides currently in use have come under scrutiny and regulation.

The surface treated composite (STC) is a completely non-toxic solution to the hull-borne aquatic

invasive species problem and as more and more biocides are recognized as environmentally hazardous, it is bound to lead to wider use of STCs.

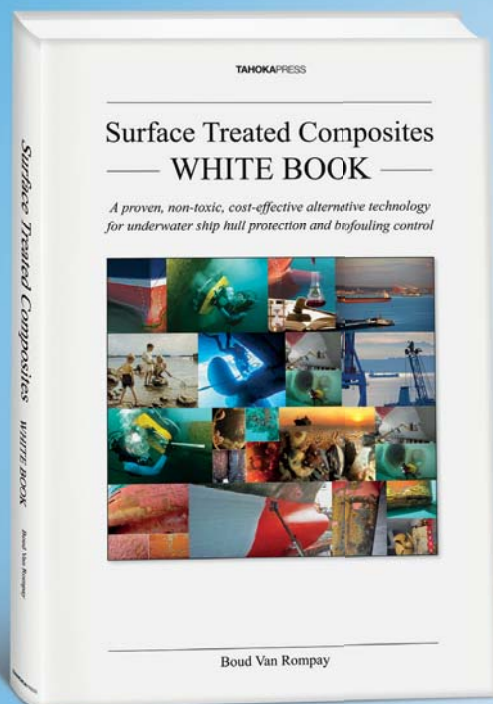
Pacific Ballast Water Group meeting **Vallejo, California, April 16-17, 2013**

Hydrex is a member of the Pacific Ballast Water Group and, as such, David Phillips, Hydrex Communications Exec, was asked to give a presentation on Ecospeed and the non-toxic approach to biofouling management and how to prevent the spread of invasive aquatic species at the PBWG meeting held at the California Maritime Academy in Vallejo, California, in April 2013.

The PBWG was formed in 1998 to promote development and implementation of safe, economical, effective management of aquatic



California Maritime Academy and Golden Bear facility where the Pacific Ballast Water Group meeting took place.



The Reference on non-toxic hull coatings

Surface Treated Composites WHITE BOOK

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for underwater ship hull protection and biofouling control.

by Boud Van Rompay

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a new era in hull protection and fouling control

nuisance species associated with West Coast shipping. Concentrating originally on ballast water as the main vector of translocation, the decision was taken to include hull fouling as a part of the group's scope of activity. The PBWG serves as a coordinating body to share information and formulate consensus solutions on ballast water management and research issues of common concern to regulators, managers, scientists and the shipping industry on the West Coast (Canada, California, Oregon, Washington and Alaska).

The PBWG has annual meetings which are well-attended, mostly in person but also by call-in on the part of Washington, DC based EPA, Coast Guard and other government agencies and sometimes the more far-flung participants such as the Department of Land and Natural

Resources in Hawaii, the Department of Fisheries and Oceans in Canada and others who are unable to attend in person but wish to participate.

The 2013 PBWG meeting was held at the California Maritime Academy in Vallejo, California, home to the *Golden Bear* research and training ship among other facilities. It was attended by representatives of USDOT Maritime Administration (MARAD – who own the *Golden Bear*), the California State Lands Commission who are responsible for invasive species programs in California, Washington and Oregon states, and a number of others from industry and science interested in the aquatic invasive species problem in the Pacific Northwest.

As providers of a non-toxic approach to eliminating the translocation of

aquatic invasive species via ship hull fouling, Hydrex was invited to give a presentation. The subject matter of the presentation was how to prevent invasions by using a cleanable, hard coating combined with cleaning a hull before a ship sails, and how to accomplish this economically and effectively. The subject matter is covered fully in Hydrex White Paper No. 8, *Invasive Aquatic Species – A proposed alternative solution*, available for free download at www.shiphullperformance.org, and in *Surface Treated Composites White Book* by Boud Van Rompay, available at www.tahokapress.com.

The meeting was concluded with a tour of the *Golden Bear* facility led by Bill Davidson, Chief Engineer of the research ship and Director of the *Golden Bear* facility. ■

Total Protection



The rudder of MV Elisabeth Russ before Ecospeed was applied in 2004, showing heavy cavitation damage.



The rudder of MV Elisabeth Russ in drydock in 2011. No further cavitation damage has occurred in the intervening 7 years.

Ships have been sailing for up to nine years (and counting) with Ecospeed without having to replace the coating on their rudders or having to opt for important and costly steel repairs.

Ecospeed can be applied on a rudder at a very low cost, especially compared with the large

drydock costs. It will give a rudder supreme protection against cavitation and corrosion damage for the rest of the vessel's service life.

Ecospeed is a really fast and easy way of keeping a rudder's performance at maximum efficiency at all times.

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Ecospeed 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 underwater hull with an impenetrable protective layer while its flexibi-

lity enables absorption of the forces that are produced by cavitation. This prevents the damage normally caused by this phenomenon.

By removing the existing paint layers and applying Ecospeed on the hull 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 Ecospeed application no full repaint will be needed during drydocking. Ecospeed is guaranteed for ten years. At the most, minor touch-ups will be required.

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