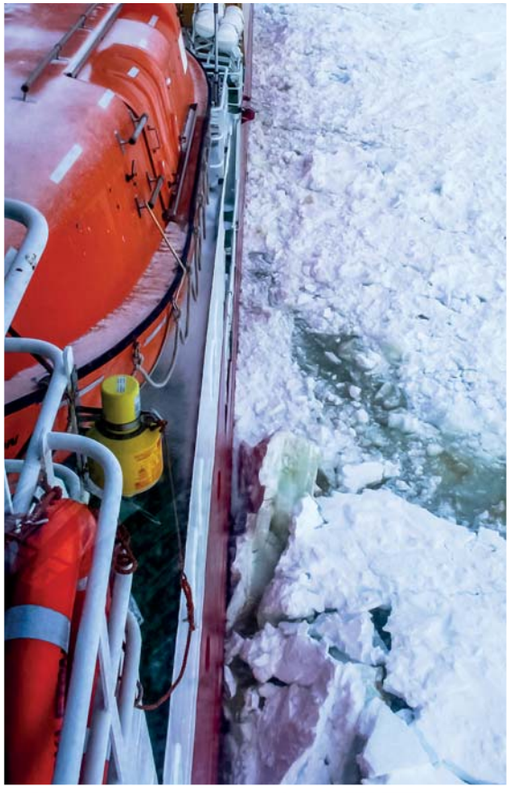
ECOSPEED® for ICE



Maximum protection and savings for ice-going vessels

Choosing the best hull coating for ice-going ships and icebreakers

Ice-abrasion resistance, corrosion protection

The number one consideration in a hull coating for ice-going vessels and icebreakers is the ability of the coating to protect the hull in the harshest marine environment there is. Only a few types of coatings are capable of providing this protection. Typically they are certified for their ice-abrasion resistance qualities by the classification societies. This status also means that use of these coatings permits a reduction in the otherwise required thickness of the ship's scantlings. This saves money in terms of requiring less steel to build the hull and reducing the overall weight of the ship.

Antifouling and foul-release coatings are not suitable for ice-going ships. They do not provide adequate protection for the hull and the impact and abrasion of the ice soon damages or removes them.

Ecospeed has been recognized by Lloyd's Register as an abrasion resistant ice coating for ships intending to navigate in ice conditions. Its correct use on the ice belt specifically permits a reduction of the ice belt's steel plating by up to 1mm.

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Certificate No: LR21476358IC-02
Issue Date: 01/09/2021
Expiry Date: 31/08/2026

Recognised abrasion resistant ice coating

The coating system below is recognised as an abrasion resistant ice coating for ships operating in polar regions, the classification of which is noted below.

The coating system is considered as meeting the requirements of 'effective protection' and 'special surface coating', as defined in applicable LR Rules and Regulations and / or Finnish-Swedish Ice Class Rules / Trafi Regulations, for vessels with applicable Polar Class or Ice Class notations.

The use and applicability of such coating systems, as designated by this certificate, may be considered when applying the relevant Rules criteria, for construction and service conditions.

Manufacturer	**Subsea Industries N.V.**
Address	Noorderlaan 9, Haven 29, Antwerpen, 2030, Belgium
Product	**ECOSPEED**
Ice Classification	PC1 to PC7
Product Colours	Unspecified
Film Thickness	1000µm
Surface Cleanliness	Minimum Sa 2½ (ISO 8501-1)
Surface Profile	Minimum 75 µm

The recognition is subject to Lloyd's Register being informed of any changes in and modifications to the product's formulation or specification and the product being used in accordance with the manufacturer's technical datasheets, training and advice, and with the relevant requirements of Lloyd's Register's Rules and Regulations.

Heather Hughes

Heather Hughes
Team Leader - Non-Metallics to Lloyd's Register EMEA
A member of the Lloyd's Register group

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MA10 2.0

Aker Arctic Technology Inc. report (2014):

"Subsea Industries has recently developed a new hull coating, Ecospeed, which could be an alternative for traditional ice-resistant epoxy coatings. The abrasion resistance of Ecospeed has already been tested in field conditions on a couple of icebreaking vessels. Based on the material provided by Subsea Industries NV (manufacturer of Ecospeed) results have been extremely good, with very little wear on the hull coating, and virtually no need for paint repairs in drydockings."

Experience has shown that Ecospeed stays on the hull longer and resists the ice far better than the most generally used specialized ice coatings. The glassflake reinforced coating uses a different resin than other specialized ice coatings which means that it remains bonded to the ship's plates even as they flex and bend under ice pressure and impact.

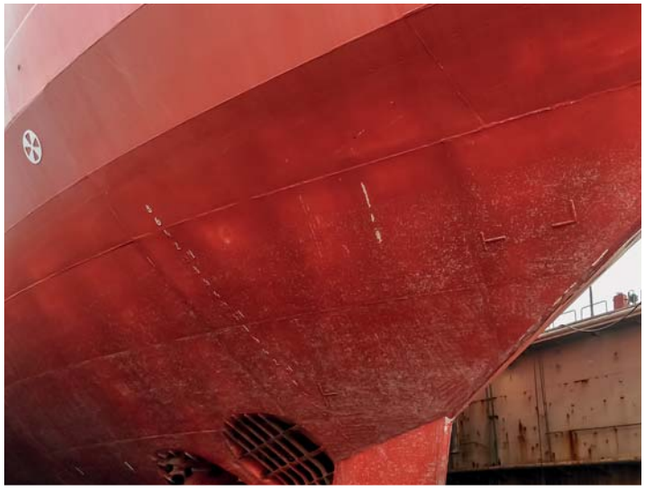
The coating is extremely tough and resilient. It stays on the ship much longer than other ice coatings and holds up much better, providing smooth protection for the hull for years.

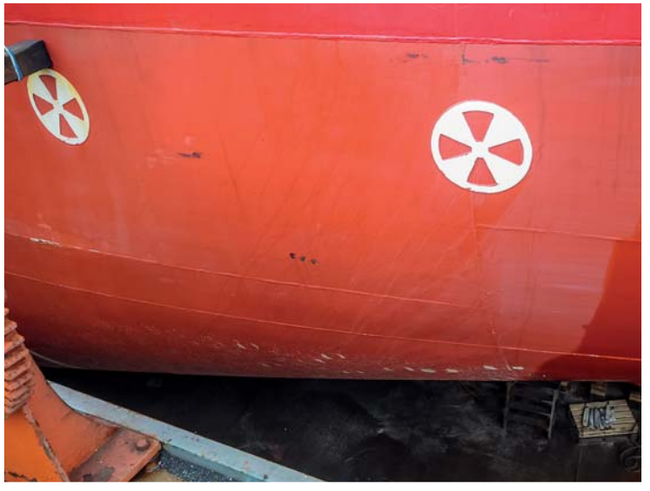
Photos on left show an icebreaker/Antarctic supply ship after a single season in the ice with a leading specialized ice paint.

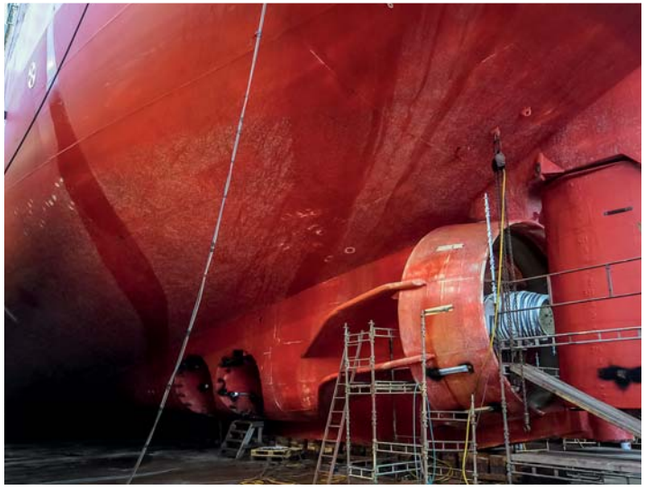
Photos on right show the same ship sailing in the same conditions four seasons after Ecospeed was applied, with no repainting during that time.

Before Ecospeed

After Ecospeed







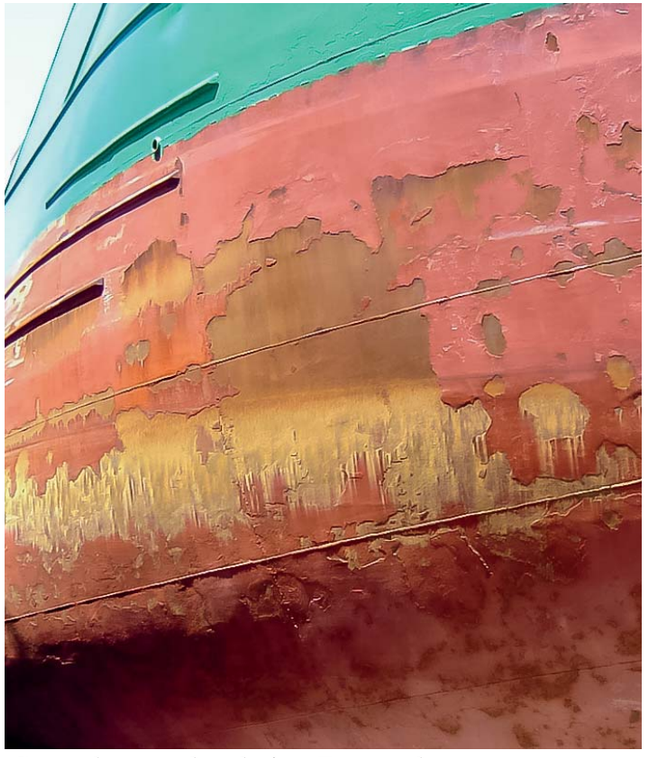
Longevity, asset protection

Ice trading ships often apply an inexpensive or inappropriate hull coating and find that it needs to be replaced in drydock after each season in the ice. Such coatings may be cheap, but the regular reapplication makes them much more expensive in the long run.

A ship with a well-protected hull over its service life will be worth more when the time comes to sell it than one which has a corroded, eroded hull. This comes down to how well it has been protected. This, in turn, depends on the coating system and maintenance methods used.

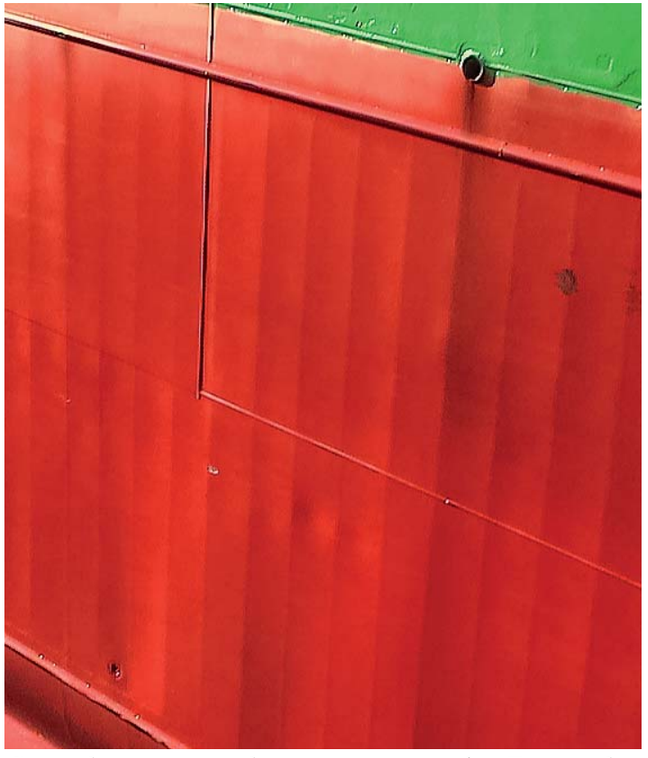
Ecospeed will last the life of the ship without the need for any major repair or full replacement of the coating.

Before Ecospeed

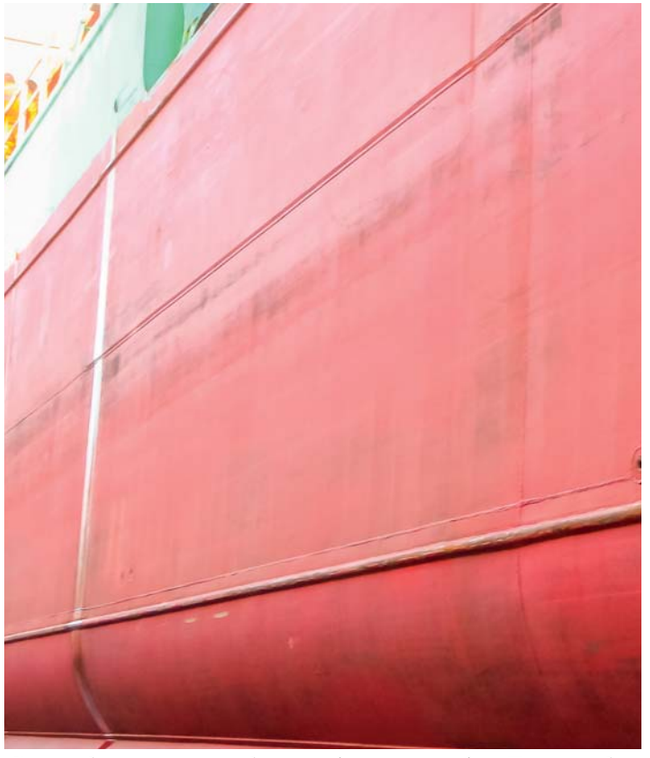


General cargo ship, before Ecospeed, one season trading in Baltic ice.

After Ecospeed



Same ship, same conditions, two years after Ecospeed applied, no repaint.



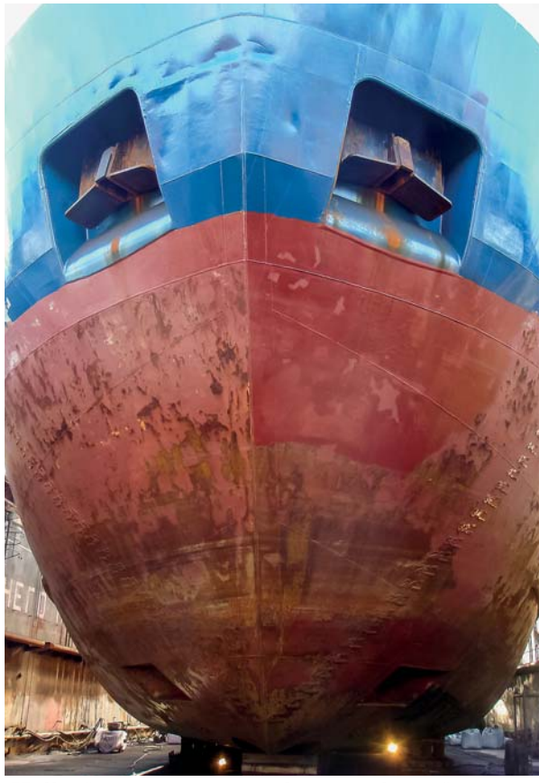
Same ship, same conditions, five years after Ecospeed applied, no repaint.

Low friction, fuel economy

An ice-going hull coating must have low friction characteristics in order to be fuel efficient. But it is not enough for the hull to be smooth and low friction at launch. It must stay that way for the life of the vessel. Most hull coatings, including specialized ice coatings, become rougher and rougher over time due to damage, disbonding and spot repairs. This will reduce fuel efficiency more and more as time goes on.

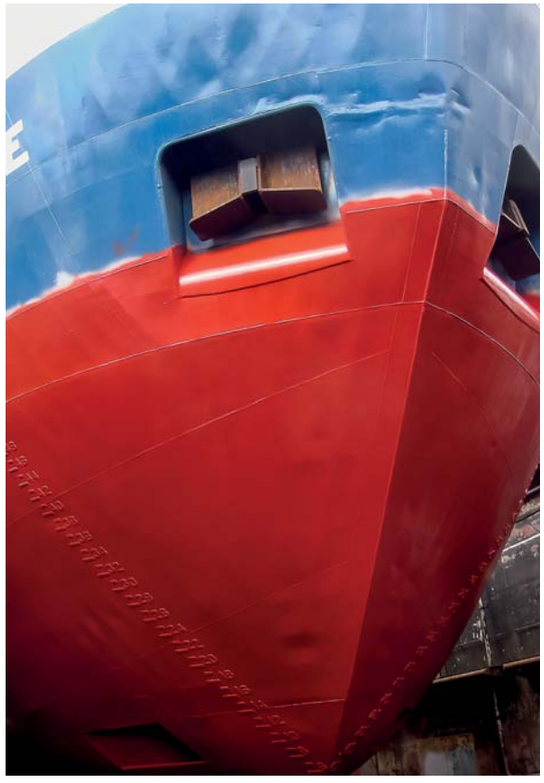
Ecospeed will hold up and will not be damaged in the ice and so will remain smooth for the life of the vessel, thus saving fuel. Even if minor repairs are needed in drydock, they blend in perfectly, leaving the hull smooth and fuel efficient.

Before Ecospeed



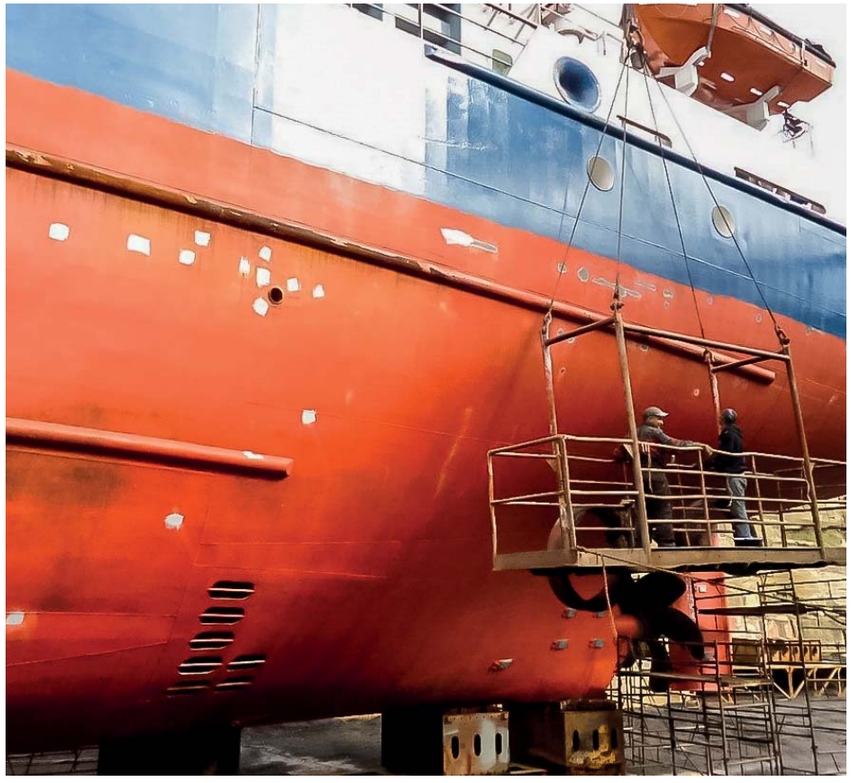
Hull of ice-going general cargo ship after a season in ice, eight years after launch with annual coating repair or replacement.

After Ecospeed



Recoated with Ecospeed, the hull is smooth and low friction.

Five years after Ecospeed

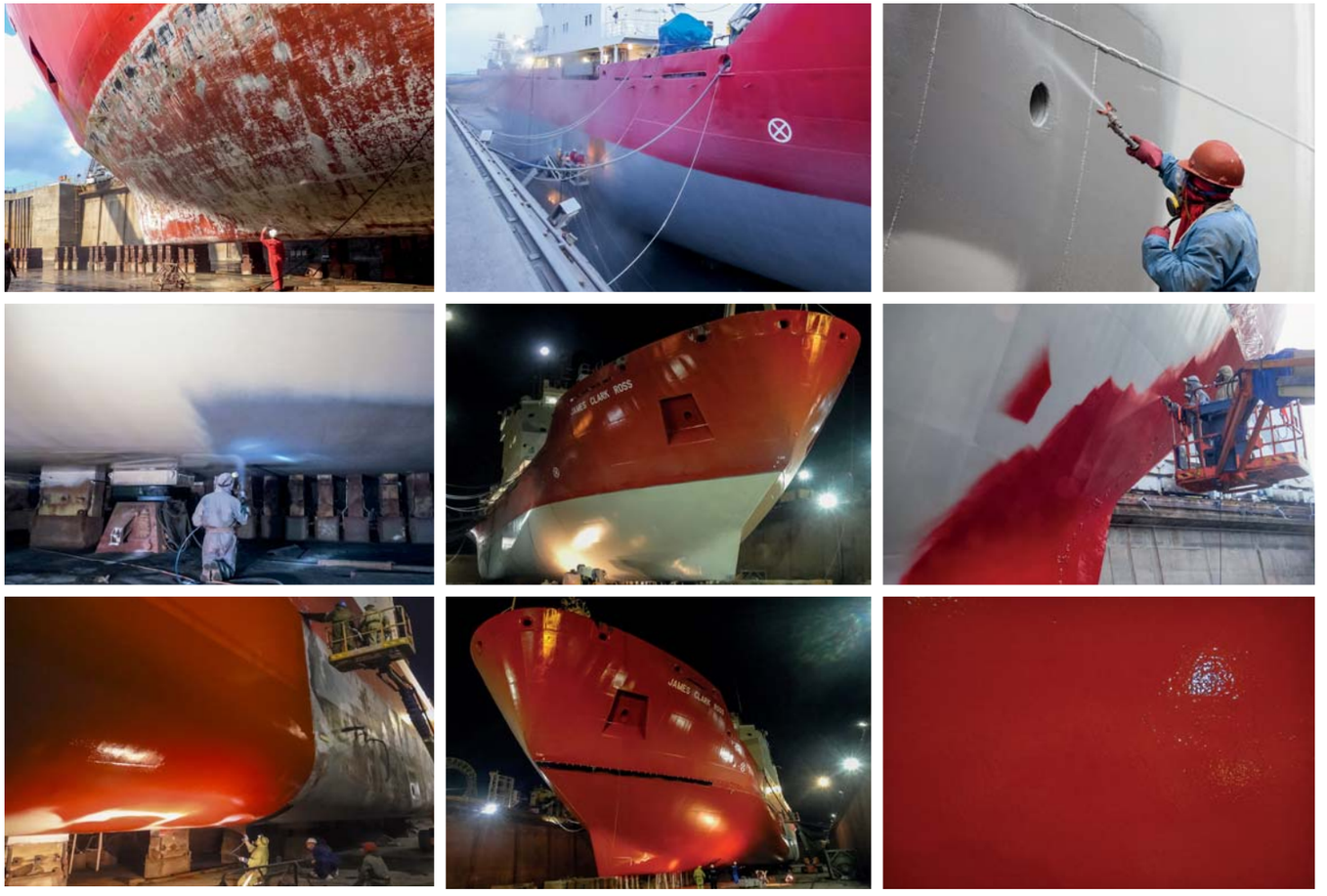


Five years after Ecospeed applied, the same hull is still smooth and the coating intact, requiring only minimal touch-ups in drydock despite trading in icy waters and no coating repair since application.

Ease of application

Some specialized ice-class paints are quite effective but are difficult to apply, with demanding environmental conditions, specialized application equipment and skills not necessarily available or possible at all shipyards. A true ice-class coating that can be applied as easily as a regular coating is rare. This can be an important point in deciding which coating to apply to a ship.

Applying Ecospeed is a simple process which can be carried out using usual spray equipment without tenting and heating. Minimum overcoat time is only a few hours and there is no maximum, making it easy to fit into your drydock or new build schedule. Only two coats required, each of 500µm. Preparation requires grit blasting to 75µm profile and Sa 2.5. Application requirements consist of a normal, single-head spray gun, humidity not above 85%, temperature 0° - 60° C. Minimum overcoat time of 3 hours (at 20° C, no maximum. Immersion time 24 hours after application.



Ecospeed application to the British Antarctic Survey's James Clark Ross. ***Top row****: Hull with previous coating, grit blasting, spray equipment.* ***Second row****: First coat Ecospeed, beginning of second coat Ecospeed.* ***Bottom row****: Finished Ecospeed coating. No special application requirements.*

Aker Arctic Technology Inc. report (2014):

"Based on the material provided by Subsea Industries NV (manufacturer of Ecospeed) it seems that Ecospeed is also easier to apply than the traditional icebreaker paints."

Stephen Lee, former Senior Marine Engineer for the British Antarctic Survey, on choosing Ecospeed for the RRS *Ernest Shackleton*:

"…there's a huge amount of preparation and logistics that have to go into getting the initial coat of traditional ice-going paint onto the hull, whereas with Ecospeed its minimal as long as you have a good paint inspector, and only minimum environmentals are needed."

Environmental safety

Soft coatings such as biocidal antifouling coatings and foul-release coatings easily scrape off on the ice, depositing toxic substances in what are often particularly sensitive marine environments. They are quite unsuitable to even occasional sailing in ice-covered waters. Many hard coatings are nontoxic.

Ecospeed is tested and proven to be completely non-toxic and safe in any marine environment, including icy waters.

Ships sailing in ice need to have non-toxic hull coatings to protect the sensitive environments in which they operate.

Capt. Wim Van Eck, Technical Supervisor, W&R Shipping, on reasons for choosing Ecospeed for the company's ice-going ships:

"Of course regard for the environment is important to us. If you are using the usual toxic antifouling paint, and if you think of all the ships that sail in the ice which are using the normal toxic antifouling paint, you have to wonder how many tons of paint per year are getting scraped off and disappear down in the sea. I can't imagine that it is really so very good."

"So it is an environmental consideration, but for us it is also that our ships will be protected from corrosion and that they would rust away if not well protected. Ecospeed provides excellent protection."

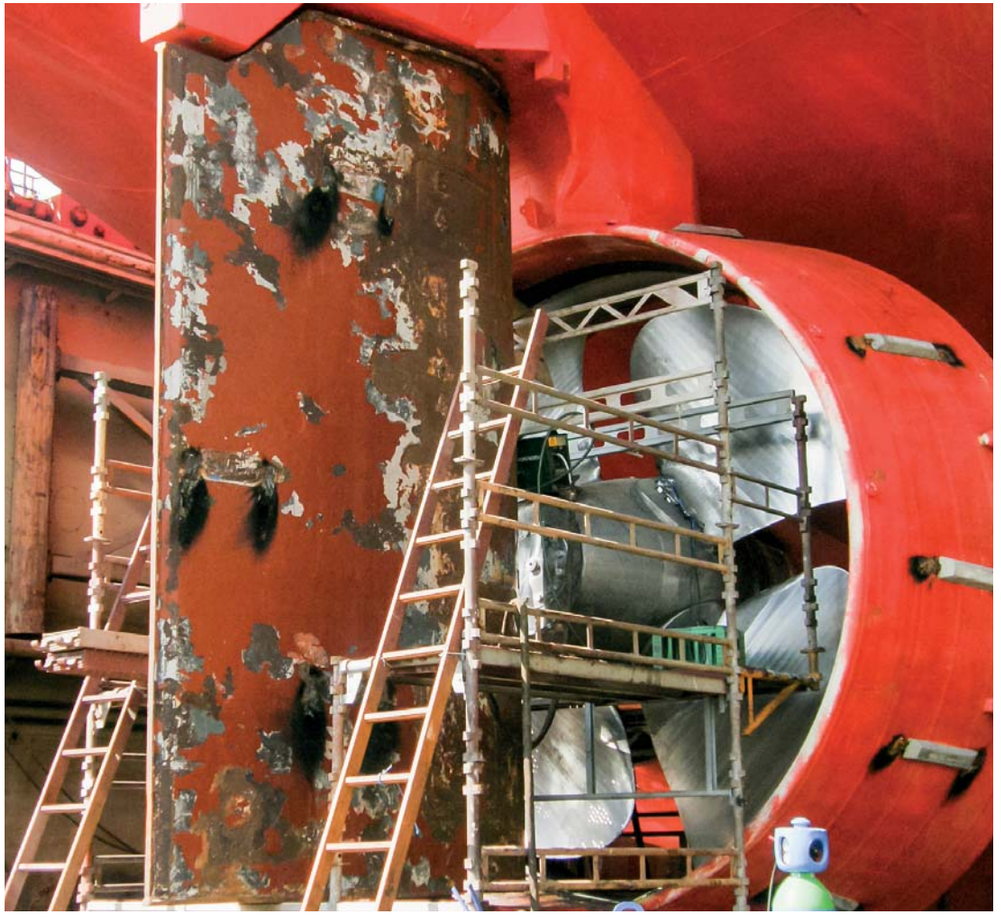
Conventional antifouling coating paint is scraped off a cargo ship sailing in the ice leaving high concentrations of toxic residues

Rudders and running gear, special protection

A specially formulated version of Ecospeed known as Ecoshield® is used for protecting rudders and other running gear from cavitation and corrosion damage. Ecoshield is equally effective in ice as in water.

Applied once, Ecoshield provides lifelong protection for the rudder, stabilizer fins, thruster tunnels and other parts of the underwater ship particularly prone to cavitation and corrosion. Ecoshield is fully compatible with Ecospeed. It can be applied at the same time in the same way. It can also be applied under or over Ecospeed.

Before Ecoshield



Rudder of ice-breaker/supply/research ship after a season in ice with conventional specialized ice abrasion resistant coating (the hull has Ecospeed).

After Ecoshield

Same rudder after 2 seasons in ice after Ecoshield applied. Very minor touch-ups required. The main hull has had Ecospeed for 4 seasons.

Contact us for more information or an estimate for Ecospeed and/or Ecoshield for your ice-going ships

ECOSPEED®
SHIP HULL PERFORMANCE TECHNOLOGY

ECOSHIELD®
THE DIAMOND STANDARD IN STEEL PROTECTION

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