



Ice conditions call for special hull protection: an abrasion-resistant coating can enable a reduction in total steel plate thickness.

Reaping the benefits of applying a low friction, ice resistant coating to your hull

ALL vessels deployed in ice conditions, whether a dedicated icebreaker operating in multi-year ice with ice inclusions or a class 1B tanker trading for only three months a year in first year ice, face difficult challenges from extremes of low temperature, severe abrasion on the hull and ice adhesion.

Class societies accordingly stipulate that vessels trading in such environments should have increased steel plate thickness, generally referred to as the "increment due to abrasion and corrosion due to ice trading".

Coatings specialist International Paint points out that some societies — including Lloyd's Register, Det Norske Veritas and the Russian Maritime Register of Shipping — recognise the benefit of applying a low friction, ice resistant coating to the hull.

Not only do these aid the passage of the vessel by virtue of low frictional resistance, but they protect the steel from corrosion by providing a physical barrier to the elements. For vessels trading in first year ice, such as in the Baltic, the adoption of a recognised abrasion resistant ice coating can actually result in an approved reduction in total steel plate thickness.

International Paint says LR states that the thickness of the steel plate can be reduced by 1 mm if a recognised low friction coating is applied in way of the

main ice belt and is maintained in good condition during service. This is in reference to the "increment due to abrasion and corrosion due to ice trading", normally set at 2 mm, and which can thereby be 1 mm less.

DNV is said to be amenable to approving lower values for the increment if a special coating is applied and if experience has shown that the coating is capable of withstanding ice abrasion and is properly maintained.

To obtain the optimum level of protection from a specially formulated, abrasion resistant ice coating it is advisable to treat the complete underwater hull up to 0.5 m above the load line. Because of the way ice breaks under pressure, icebreakers derive particular benefit from the coating of the entire underwater hull.

Generally all parts of the hull could be in contact with ice, whether during the initial ice break or with the subsequent impact of large ice inclusions as the vessel proceeds.

Although vessels trading in first year ice do not require complete coating of the underwater hull, it is deemed prudent to treat the ice belt around the hull as a minimum.

"Traditional anti-corrosive systems, including standard pure epoxy systems, are unable to provide a solution to these challenges," said International

Paint's marketing development manager Jim Brown. In contrast, the company's abrasion resistant ice coating Intershield 163 Inerta 160, developed more than 30 years ago for ships trading in the Baltic region, has established an outstanding reputation for in-service performance.

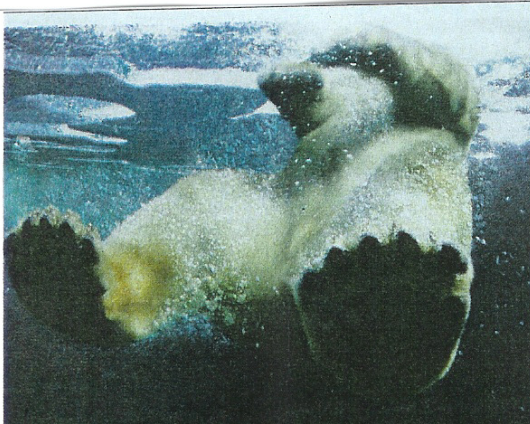
The product has to date been specified for 1,070 ice trading vessels, aggregating more than 15m dwt.

Research indicates that the steel hull of a vessel trading in ice and treated with a traditional anti-corrosive system can experience an increase in average hull roughness from 100 to 225 microns in the first year in consequence of abrasion and subsequent corrosion.

This necessitates up to 4% more power to maintain the same vessel speed. Formulated to withstand ice impact and abrasion, Intershield 163 Inerta 160 has been shown to be effective in controlling surface roughness.

Mr Brown says the product's abrasion resistance, low frictional resistance and low ice adhesion properties each contribute significantly to increased efficiency and operational cost control.

It is claimed that research shows it is possible to achieve an annual fuel saving in the range of 7%-10% with a typical vessel engaged in Baltic trade by using Intershield 163 Inerta 160 compared with a standard coating.



Ice breaker

Intershield® 163 Inerta 160

Proven, high performance abrasion resistant coating especially designed for ice-going vessels. Low frictional resistance and ice adhesion. High solids, low VOC pure epoxy. Designed for operation at temperatures as low as -50°C (-58°F). Control of fuel consumption by control of hull roughness. Suitable for use on anode shield areas. Options for Newbuilding and Maintenance.

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