ECOSPEED®

SHIP HULL PERFORMANCE TECHNOLOGY

Magazine

Contents

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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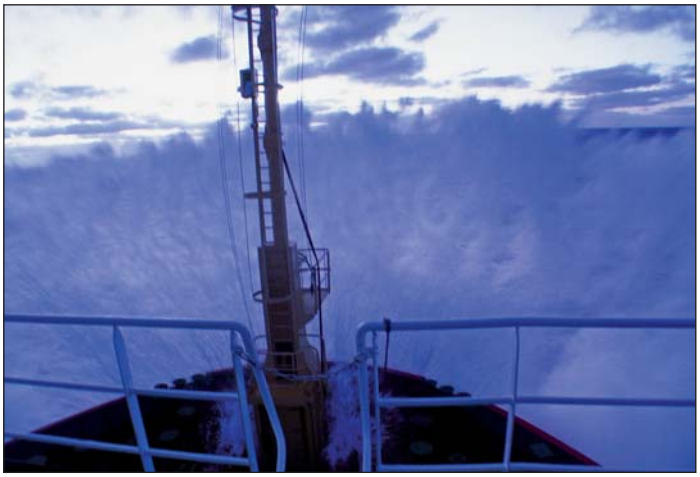
Ice – The Ship Hull Nemesis
Part II: Ice-going ships, their hulls and protective coatings

By Steven Ferry



The RRS Ernest Shackleton *in Antarctic ice up to 2.5 m thick during the 2009/2010 seasons.*

If a ship with a fouled hull is heading for polar waters, it faces a dilemma: either use biocidal antifouling to keep the NIS population in check—to then release the biocides and the biocide-tolerant species into the polar ecosystem—or, since conventional hull coatings are very hard to underwater clean of such marine life, bring a hull full of non-indigenous marine life into the Arctic where it soon will be scraped off by ice and so deposited into a pristine and vulnerable environment where it then proceeds to wreak havoc. Fortunately, as you will see in this part of the article, there is a third option.

Ice-Going vessels

Two types of vessels normally ply the icy waters: icebreakers, and ice-class ships.

Icebreakers

An icebreaker is a special-purpose ship or boat designed to move and navigate through ice-covered waters and, as the name suggests, break a passage through the ice. For a ship to be considered an icebreaker, it requires three traits most normal ships lack:

- a strengthened hull;
- an ice-clearing shape; and
- the power to push through sea ice.

Icebreakers clear paths by pushing straight into ice pockets. The bending strength of sea ice is so low that the ice normally breaks without noticeable change in the vessel's trim.

In cases of very thick ice, an icebreaker can drive its bow onto the ice, sometimes repeatedly, to break it under the weight of the ship.

Deployment

This chart showing where the world's 111 icebreakers are deployed, i.e. which countries own and operate them, sheds light on where icy waters are a front-burner problem.

Country	Ice Breakers
Argentina	3
Australia	1
Austria	2
Canada	6
China	2
Chile	3
Denmark	4
Estonia	3
Finland	8
France	1
Germany	5
International	1
Japan	3
Kazakhstan	4
Latvia	1
Norway	1
Russia	40
South Africa	2
South Korea	1
Spain	1
Sweden	8
Ukraine	1
United Kingdom	3
United States	7

As shown, Sweden, Denmark and Finland have 20 ice breakers between them, in order to cover a relatively small area of ocean: the Baltic Sea, the Gulf of Finland, and the Gulf of Bothnia.

Then, again, Russia deploys 40 ice breakers, telling its own tale.

Canada, not surprisingly deploys six icebreakers, while the United States (covering both Alaska and the Great Lakes) deploys seven.

Ice Class ships

As far as coping with icy waters goes, the next rung down from the icebreaker is the ice class ship.

What Ice Class means

In short, a ship is considered ice class if it has a strengthened hull to enable it to navigate through ice. Additionally, an ice-class vessel requires structural reinforcements, particularly at the ice belt.

Most of the stronger classes also require several forms of rudder and propeller protection.

Arctic Classes

The American Bureau of Shipping (ABS) has a system of ice classes which includes classes A5 through A0, B0, C0, and D0. The A5 class is the strongest built of the classes, with D0 being the weakest.

All other major classification societies have a similar system of ice classes, and converting between ice classes is relatively easy. In most cases, only the names of the classes are changed while the specifics of the Arctic class remain similar or identical.

ABS Class A5 is the only Arctic Class that may act independently in extreme Arctic waters with no limitations. Other classes are subject to limitations on time of year, required escort (always with a vessel of higher ice class) and ice conditions.

Finnish-Swedish Ice Class

According to the regulations issued by the Swedish Maritime Administration and the Finnish Transport Safety Agency (TraFi), merchant ships operating in first-year ice—i.e. ice new for the season and not remains of last season's ice—in the Baltic Sea are divided into six ice classes based on requirements for hull structural design, engine output and performance in ice. International classification societies have incorporated the Finnish-Swedish ice class rules into their own rulebooks and offer equivalent ice class notations that are recognized by the Finnish and Swedish authorities.

Ships of the highest ice class, 1A Super, are designed to operate in difficult ice conditions mainly without icebreaker assistance while ships of lower ice classes 1A, 1B and 1C are assumed to rely on icebreaker assistance.

IACS Polar Classes

The International Association of Classification Societies (IACS) published a set of Unified Requirements for Polar Class Ships to complement the IMO Guidelines for Ships Operating in Arctic Ice Covered Waters. This will effectively unify the ice classes for all IACS member societies. Seven Polar Classes are proposed in the requirements, abbreviated as PC1 through PC7.

500 and counting

Today, there are about 500 ice-classed ships in the world, a number that is expected to grow significantly as the Arctic passages (the Northwestern Passage and the Arctic Sea/Northeastern Passage) open up for shipping.

Ice damage

As those who sail icy waters are well aware, ice damages hulls. How much or how little depends on skill, foresight, and—to a degree—luck.

This damage normally comes in two forms: structural damage to the hulls, and damage to the hull coatings.

Structural hull damage

Hull damage from icy waters includes:

- Dents on the plating, frames, stringers and web frames. As mentioned, these are often cumulative.
- Fractures: Cracks and ruptures occur most often on the plating. These can be found on ships that are in bad repair. The reason for ruptures is often that plating has worn out. Cracks are usually observed in a junction of plate and frame below water-line level.
- Wear in paint: Ice pieces wear a ship's paint due to abrasion. This can be seen clearly at the water line level, but also in the bilge and the bottom areas.
- Bilge keel damage: Bilge keel dents, scrapes, and ruptures are often incurred by passenger vessels while maneuvering in harbor or in an ice channel.

In September 2013 the tanker *Nordvik* hit an ice floe while on the Northern Sea Route and was holed and started taking in water. Ice damage can be sudden and serious or can simply wear the hull down over time, creating a growing hazard for the ship and the environment.

Hull damage—causes

Events or situations that cause structural ice damage include:

- High speed in ice: This relates especially to ships of high propulsion power compared to their size.
- High speed in an ice channel may damage a ship's side shell and plating above the water line on the bow area due to extended ice loading by the bow wave.
- Damage in an ice channel: Mid- and aft-ship hull areas may be in contact with the channel edges when the ship is turning.
- Compressive ice: The ice channel may close due to the moving ice field. In this situation, the ship becomes stuck in ice, and damage often occurs in the mid-ship area on the flat side region.
- Ice ridges: *Ice ridges may extend 3 m above and 20 m below the water level.*
- On ships in bad repair or with insufficient ice strengthening, ice damage to the hull is often cumulative, i.e. dents and scrapes incurred during successive winters.
- An often overlooked cause of structural hull damage is corrosion. When the protective paint coating is scraped off, the underlying steel is exposed to the highly corrosive seawater. In Antarctica the ice may also contain lava which adds to its corrosive effect on the steel. As a result, the now unprotected steel plates are worn away by the abrasion of the ice and the corrosive effects of seawater.

Hull coating damage

If ice contact—and we're not talking ramming icebergs here—can do this much structural damage, it is no

Tanker Nordvik*, photo hmtp.ru.*

Hull of icebreaker recently returned to drydock after Polar service.

wonder that it can be murder on hull coatings.

At the top of this page are some photos of the hull of an icebreaker recently returned to drydock after Polar service.

Below you can see the hull of an ice-going cargo ship after a year in ice with conventional hull paint.

Hull of ice-going cargo ship after a year in ice with conventional hull paint.

Hull coating camage—effects

Apart from the most obvious impact—losing major areas of hull coating that leaves the hull exposed and unprotected, thereby shortening the hull life—the other major impact is significant loss of fuel efficiency.

A rough and fouled hull can invoke a fuel penalty of 40% or more. Even a fairly smooth hull with a heavy slime layer can carry a 20% fuel penalty. Extra fuel burned to propel the ship means extra, unnecessary atmospheric emissions including Nitrogen Oxides (NOx), Sulfur Oxides (SOx), CO_2, and black carbon. These emissions have been shown to be more harmful in polar regions than in other waters.

The fuel penalty is also economic: fuel is not cheap. In fact, adding 25-40% to the fuel bill can make the difference between profit and loss.

These factors apply to any vessel sailing in any conditions, but the polar regions are particularly sensitive to harmful air emissions and it is therefore even more important to do anything possible to reduce such emissions from ships operating in these zones.

A smooth hull that is not subject to coating degradation but remains smooth for the life of the ship—or even becomes smoother with regular cleaning—greatly helps reduce this fuel penalty.

Also, a hull coating that permits regular and easy in-water removal of fouling, including slime, is the other part of the equation. The fuel penalty can be kept as low as the few percent that would result from the slime layer that accumulates in between cleanings.

The costs of trading in icy waters

Conventional hull coatings, as shown earlier, are mostly, if not all gone after even one season in the ice, calling for a drydock visit to have the coating reapplied.

Annual drydock

This has been a very familiar story to Wim van Eck, partner in W&R Shipping, who 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 would disappear and so you had to drydock in order to repaint during the summer time."

Is there a way around this annual repainting in drydock?

Conventional Ice-grade coatings

One solution is to apply a more durable, ice-grade coating.

However, even though there are several ice-grade coatings available, by one manufacturer's own admission, many of these require extensive care in application:

"It is fair to acknowledge that some shipyards have expressed reluctance when asked to apply [our product]. And, since proper application is critical with any hull coating, their concerns must be addressed.

"Because [our product] has a very low solvent content, it cures rapidly, 'going off' within minutes. It is so viscous that it must be heated for spraying and must be applied to steel with a relatively deep 75-micron blast profile in one coat, 500 microns thick.

"Here, the solution is application by way of a hot twin-feed spray machine, where the curing agent and the base are heated and mixed at the point of application immediately before spraying. In short, the ratios of the curing agent and the base are preset, and delivered automatically.

"Some shipyards more accustomed to single pump coatings delivery have expressed concern over the perceived complexity of this method."

Okay, this is one solution, but is there a way around its complexity?

Yes, there is.

Experience speaks

Stephen Lee, former Senior Marine Engineer for British Antarctic Survey—the BAS's equivalent of a Technical Superintendent—was

Supreme Rudder 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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instrumental in the initial research which led to replacing the Antarctic-going research and supply vessel RRS *Ernest Shackleton's* underwater hull coating in 2009.

He recalls: "We looked at all the alternatives, including a product called Ecospeed, making many comparisons between all of the products available.

"For instance, because of the nature of our business and where we operate, we also required a paint system that would have significant environmental benefits as well as conforming to the polar code and latest classification societies regulations. We required a paint system that was cost effective in purchase, application, and maintenance.

"We wanted a simplified paint system that no matter where you went in the world, a paint contractor would be able to apply it without having to rent expensive equipment or shielding to ensure application could continue.

"We also wanted to be able to conduct minor repairs either by the yard paint contractor or our own crews. Ecospeed gave us this capability.

"Application of some of the more traditional icebreaker paint requires twin feed paint system which requires a great deal more care during the application process, as well as ensuring all the environmentals are correct, which can include tenting up space heaters around the area that is to be painted.

"The other paint options were very comparable with Ecospeed in terms of purchase price and performance in the broadest of terms, but the main, huge difference was the actual cost and complexity of application of the paint.

"The preparation is the same, 2.5 SA (near-white blast cleaning) over the hull, but the actual application, not having to get the environmentals right, not having to tent up the area, if it's slightly cool not requiring space heaters, if the area is gingered slightly which may or may not require a sweep blast before you can put the primer on—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 it's minimal as long as you have a good paint inspector, and only minimum environmentals are needed."

Surface Treated Composite (STC)

Ecospeed, to understand its advantage, is a special glassflake reinforced Surface Treated Composite (STC)—a type of hull coating which not only offers hull protection performance that surpasses any conventional ice-grade coating, but which also accomplishes this feat through a simple, single-pump coating, welcomed by all shipyards.

The STC solution

No one is disputing that Arctic shipping will continue to increase. At the same time, shipping in and around the Baltic, Greenland, Alaska, the Great Lakes, and the Russian ice bound lakes will, if not increase, continue unabated as well.

This calls for a hull-coating solution that will solve the major problems facing ships sailing icy waters, as discussed above – a hull coating that:

- adheres to the hull even under the most adverse and icy conditions, and so continues to protect the hull;
- is entirely non-toxic and so does not release biocidal anti-foulants into the environment or leave toxic debris scraped off on the ice;
- provides a smooth, strong, low friction coat which can be in-water cleaned easily of all bio-fouling prior to leaving warm-water ports to both increase fuel efficiency and to prevent translocation of NIS into icy latitude waters;
- does not require elaborate temperature and other arrangements or advanced shipyard technologies to apply;
- is very durable and long-lasting, which is particularly important to offshore oil and gas exploration and production vessels which do not drydock very often – the coating should last 25 years or more; and
- is flexible so that it continues to adhere to the steel plates of the ship even when they are flexed and distorted by impact with the ice.

This hull coating exists. It is a glass-flake reinforced Surface Treated Composite (STC).

A coating that:

- provides long-lasting, smooth, low friction protection of the hull even in extremely harsh environments;
- is non-toxic, non-polluting, non-contaminating;
- provides the best answer to preventing the spread of hull-borne NIS;
- is very fuel efficient and so provides significant reduction in fuel costs, GHG, black carbon;
- is easy to apply; and
- can be cleaned underwater as

often as needed, improving its surface texture over time, without damage to the coating or harm to the environment.

Ecospeed

When it comes to protecting the hulls of ice-going vessels, the non-toxic glassflake reinforced STC Ecospeed® has proven to be remarkably durable, typically outperforming other specialized ice class paints.

It has demonstrated excellent attachment to the hull, low friction properties, and successful resistance to extremely icy conditions, withstanding the harshest winter seas and ice on numerous occasions.

Over the last ten years, about 30 Ecospeed-coated vessels have sailed the northern Baltic Sea, Canada and the polar regions during winter,

MV Patriot's *hull after a year in the ice with a conventional ice coating.*

some even as far as the North and South Poles. These vessels, frequently enduring the impact of large pieces of floating dry ice, or the pummeling of the ice which is part of the icebreaker's stock-in-trade, have shown no ice damage, and very little coating deterioration; and none of these vessels required more than just a few touch-ups during their drydock visits.

Certified abrasive resistant coating

Consequently, 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.

Interscan experience

Interscan Schiffahrt controls a fleet of 23 container and multipurpose cargo ships ranging in size from 1,723 to 11,800 dwt. Many of these

MV Patriot after 4 years in the ice after being coated with Ecospeed (with no repair or recoating).

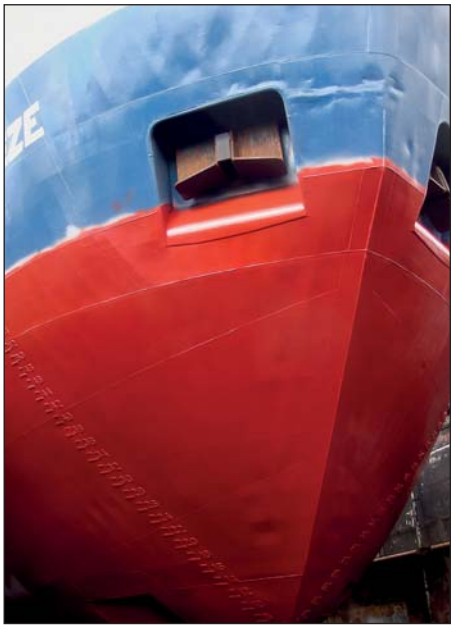
vessels trade in northern Europe, mainly in the Baltic.

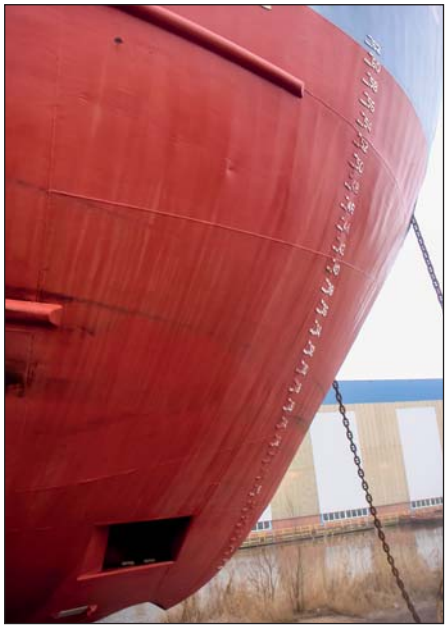
Until 2005, all those ships trading in ice in the Baltic region went through a cycle of having all their bottom paint scraped off by the ice each winter and having to drydock and repaint every spring. The paint used was a standard epoxy coating.

In 2005, the superintendent engineer came across Ecospeed and decided to test the environmental and fuel

W&R Shipping MV Crown Mary *in typical winter sailing conditions.*

W&R Shipping's MV Crownbreeze *after a year in ice with conventional ice coating (above), and after two years in ice after the Ecospeed application (below).*





saving benefits of this product on MV *Patriot*, an 82.3-meter ice class E2/Finnish 1B general cargo vessel.

Seven years later, Michael Tensing of Interscan 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 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.

W&R Shipping experience

W&R Shipping has converted its existing fleet to Ecospeed and specified Ecospeed as the coating for any newbuilds ordered.

In 2007, co-founder Captain Wim van Ecke read about Interscan's success with Ecospeed on vessels that, like his, were also trading in Baltic and Northern European ice every winter, and he decided to try Ecospeed on the W&R ships.

As a result, W&R has now standardized on Ecospeed, and for good reason. As Capt. Van Ecke 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."

RRS *Ernest Shackleton*

When British Antarctic Survey's RRS (Royal Research Ship) *Ernest Shackleton* left drydock in 2009, the hull was newly coated with Ecospeed. The pictures at the bottom of this page show the state of the hull before Ecospeed was applied.

On the next page you can see the same hull after two seasons in the ice with Ecospeed. No repair or recoating. Note that the section of hull above the waterline had not been coated with Ecospeed originally and this omission was subsequently corrected when the level of protection afforded by Ecospeed was clear to see.

When she returned to drydock after two seasons of battering her 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, bar a very few nicks and scratches.

A very surprised Stephen Lee, then Senior Marine Engineer for British Antarctic Survey jokingly asked, "Are you sure you've taken this ship to the ice?"

According to 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 touched it at all."

Lee continued, "The biggest thing was the surprise at seeing the areas where you'd expect it to have sustained 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."

A paint inspector's surprise

Howard Jess was the paint inspector for the initial Ecospeed application to the *Ernest Shackleton* in 2009, and he viewed the hull again after two years in the ice.

"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."

As this article was going to press, the *Shackleton* drydocked again, after four seasons in the ice, and the coating was found to be in incredibly good shape, as reported by the paint inspector Howard Jess.

The state of the hull of RRS Ernest Shackleton *before Ecospeed was applied.*

The hull of RRS Ernest Shackleton *after two seasons in the ice with Ecospeed.*

Ecospeed compared

While there are manufacturers of ice-specific hull coatings, and while there is no disputing the relative efficacy of such products, we have chosen to spotlight Ecospeed as the ice coating of choice because it comes with an unheard-of 10-year guarantee and because it is so easy to apply when compared to the complexity and temperature sensitivity required for applying the other ice coatings.

As admitted above by one of these manufacturers, many shipyards are in fact hesitant to work with these products since they can too easily spoil during application, and require meticulous preparation as well as expensive equipment and laborious environmental set-ups (such as dual nozzle sprayers, tenting and heating).

In contrast, Ecospeed is applied like any conventional, temperature-tolerant coating in two simple coats, each of 500µm with a 3-hour minimum, no maximum overcoat time, to a total of 1000µm dry film thickness (DFT).

Conclusion

Over the next several decades, ice-going traffic will continue to increase and along with that so will the potential damage not only to hulls and their coatings, but also to the pristine ecological environments seeing this traffic.

Therefore, choosing the best hull protection is no longer just an economical issue, but also an ethical one.

Another factor in choosing a protective hull coating is that the cost of an effective coating lies not only in the paint itself, but also in its ease or complexity of application, in its longevity, and in the fuel savings it makes possible. The difference between painting the hull every year and not having to do so for 25 years is considerable.

The right coating, then, requires careful consideration and a weighing of all relevant factors including total ownership cost.

As discussed above, the jury has returned with a verdict: The best choice—the one that meets both economic and environmental requirements—is a glassflake reinforced Surface Treated Composite (STC) coating.

Ecospeed has shown itself to be the toughest and most durable STC and the only one that comes with a 10-year guarantee.

Steven Ferry, Words & Images

(www.words-images.com) ■

Ocean: Canada's most powerful tugboat protected with Ecospeed

When it came to the hull coating for its newest tug, the TundRA 100, the most powerful harbor tug ever to be built in Canada, Groupe Ocean chose Ecospeed, a non-toxic, hard, long-lasting coating with very high abrasion resistance, perfectly suited to tugs and to ice-going vessels of all types. The article goes into details of the reasoning behind Ocean's move to this innovative hull coating.

Left: Patrick Chabot, Fleet Director of Ocean. Right: Jean-Rock Boudreault, in charge of the paint application.

Ocean began life as Aqua-Marine, founded by the company's present President, Gordon Bain, in 1972 and specializing in underwater work. In 1987 the company evolved into Ocean Construction Inc. and acquired Québec Tugs, Ltd. Through a series of subsequent acquisitions and expansion moves, including the outright purchase of the Isle-aux-Coudres shipyard in 1997 which was then renamed Ocean Industries Inc., Ocean has become one of the main suppliers of integrated marine services in Canada and a leader in the Canadian marine industry. The company intends to continue growing while maintaining a strong focus on its core services and its team.

The acquisitions have included a number of tug companies and Ocean has built up a fleet of tugboats, many of which are ice-strengthened and equipped to operate in the severest winter conditions. In 2005 a fleet renewal program was begun with the christening of the *Ocean K. Rusby*, a new state-of-the-art tug powered by Z-drive propellers. This was the first of eight new tugs.

Groupe Ocean shipyard Isle-aux-Coudres, Québec.

2012 marked the beginning of construction of the harbor and escort tug, an as-yet unnamed TundRA 100 tugboat, the most powerful tug ever to be built in Canada. The new Ocean TundRA 100 is 34.2 m/112' 2" long with an overall breadth of 13 m/42' 6" and a 6.5 m/21' 4" draft. With a double Z-Drive propulsion system, powered by two MAK 9M25 engines, the tug will have a total power output of 6,000 kW/8,160 bhp and a top speed of 12.5 knots. The tug has an ice class classification of 1 AS FS.

The RA in TundRA stands for Robert Allan. The new TundRA 100 tug built by Ocean was designed by Robert Allan Ltd., naval architects and marine engineers. Canada has a vast arctic frontier, an east coast subject to extreme winter conditions, and the Great Lakes which experience severe ice conditions every winter. Robert Allan Ltd. has for decades worked with clients operating in these cold weather regions. They have learned many of the secrets of designing ice capable tugs which not only meet the class rules for hull strength, but which incorporate many of the critical lessons learned to make these boats safe and practical to operate in this extreme climate. Every one of these vessels is uniquely designed for a specific set of operating conditions.

Hull coating

The Ocean tugboats are generally built for service in harsh, icy conditions. The coating used on the hull is very important for a number of reasons, as Patrick Chabot, Director of the fleet explains: "We have a lot of experience with hard coatings, mostly epoxy. However, with the ice conditions in our area, the protection of the vital parts of the hull such as welding seams, rudders or cavitation-prone area was not adequate or sufficient to meet the docking intervals." Ocean have also tried specialized ice-going hard coatings but found that, "the special application requirements make it very expensive under cold temperatures."

In 2011, Ocean found Ecospeed, a glassflake reinforced coating which is not specifically aimed at ice-going vessels but which has been found to be one of the best ice class hull coatings available. Ecospeed has been certified as an ice abrasion resistant coating which allows a reduction in scantlings of 1 mm on ice-going vessels where Ecospeed is used as the hull coating. Philippe Filion, Director of Public Affairs and Business Development explains, "In order to have a better coating suitable for ice and to limit our environmental footprint, we introduced Ecospeed in 2011. We completed two tugs and are working on another

Application of Ecospeed on TundRA 100.

TundRA 100 with Ecospeed glassflake, ice abrasion resistant coating on hull.

one at this moment (the TundRA 100). At this time, this system looks right for us." Based on the success Ocean has had with the first two Ecospeed applications, Ecospeed was chosen as the coating for the new TundRA 100 tug. The main reasons for applying Ecospeed to the new tug are that it offers, "good hull protection, reduced roughness and friction due to hull corrosion, and positive environmental impact," says Philippe Filion.

An additional factor is that tugs have a long life expectancy and one of the properties of Ecospeed is that it is applied once and is expected to stay on for the life of the hull with perhaps some touch-ups but no major repair or replacement.

Ecospeed is expected to stay on for the life of the hull.

Conclusion

Philippe Filion concludes by saying that, "Hydrex is a very important partner for Ocean. We have a good working relationship." And the proof of the coating lies in its ability to stay on and stay smooth despite the harshest of sea environments.

It is appropriate that the most powerful tug ever built in Canada by one of Canada's leading suppliers of marine services should have its underwater hull protected by Ecospeed, a leader in underwater hull coatings and in environmental performance. ■

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