Hempadur Multi-Strength GF 35870

Unsurpassed low friction, abrasion and ice resistant coating

Proven protection for ice trading vessels

If your vessel operates in icy waters, you need a coating that will protect it from the extreme conditions and improve its operating efficiency.

Opportunities for commercial shipping in the Arctic Ocean are on the increase and there is growing demand for icebreakers and ice-class vessels. But navigating the harsh conditions of the Arctic is fraught with challenges. Temperatures can drop below -50°C / -58°F and the build-up of ice on the ship can wreak havoc on the superstructure and fuel efficiency. Packed ice can scratch or dent the hull, and even in open seas, vessels are under constant threat from drifting ice floes and icebergs.

At Hempel, we understand these challenges. Whether your vessel is a dedicated icebreaker or a reinforced ice-class vessel that operates in ice a few months a year, we can supply a coating system that will protect your vessel from the harsh conditions and improve its overall efficiency.

Why choose an ice resistant coating from Hempel?

- Proven resistance against extreme abrasion and impact
- Smooth surface to assist ice slip and prevent ice accretion
- Flexible glass-flake reinforced coatings do not crack if steel dents
- Easy application, with standard airless spray equipment
- Early resistance to water for faster out-docking
- Easy grinding and abrasive sweeping when repairs are needed
- Second-to-none technical service and support

Common causes of ice damage

High-speed impacts
Impact with ice floes and ridges is one of the most common causes of damage to ice-going vessels. If a ship strikes an ice edge at full speed, it can cause severe damage to the bow and sides, while ice below the water line can damage the sides and hull.

Impacts when manoeuvring
Ports can be full of ice rubble – sometimes several meters thick – making even simple manoeuvres hazardous, especially to the hull and propulsion machinery. Turning or reversing in an ice channel can also be dangerous, with most damage caused to the mid and aft hull areas by floating ice floes and ice edges.

Compressive ice
Ice fields are rarely static and moving ice fields pose a particular threat when they cause the ice channel to narrow. For a ship caught in this situation, the mid-ship and flat side areas are in most danger.

The icing effect
In cold weather, ocean spray can super-freeze on a vessel's superstructure, which adds significant weight to the vessel and causes damage to the bulkheads, decks and rigging.

Vibration from ice loading
The vibration caused by impact on an ice ridge can lead to dents on the hull and cracks on plating junctions. These damages are often cumulative, and will grow worse over time if not repaired.

Ice Class Notations

All major classification societies have designations for ice-class vessels and icebreakers. Class notation is based on a number of factors, from the plate thickness and hull strengthening to the shaft system and propeller.

Approximate correspondence between Ice Classes of the Finnish-Swedish Ice Class Rules (Baltic Ice Classes) and the Ice Classes of other Classification Societies.

Classification Society	Ice Class				
Finnish-Swedish Ice Class Rules	**I Super**	**IA**	**IB**	**IC**	**Category II**
Russian Maritime Register of Shipping (Rules 2007)	Arc 5	Arc 4	Ice 3	Ice 2	Ice 1
Russian Maritime Register of Shipping (Rules 1995)	UL	L1	L2	L3	L4
Russian Maritime Register of Shipping (Rules 1999)	LU5	LU4	LU3	LU2	LU1
American Bureau of Shipping	IAA A1	IA AO	IB	IC	DO
Bureau Veritas	IA SUPER	IA	IB	IC	ID
CASPPR, 1972	A	B	C	D	E
China Classification Society	Ice Class B1*	Ice Class B1	Ice Class B2	Ice Class B3	Ice Class B
DNV GL	ICE-1A* ICE-10/E4	ICE-1A ICE-05/E3	ICE-1B/E2	ICE-1/E1	ICE-C/E
Korean Register of Shipping	ISS	IS1	IS2	IS3	IS4
Lloyd's Register of Shipping	1SS	1A	1B	1C	1D
Nippon Kaiji Kyokai	IA Super	IA	IB	IC	ID
Registro Italiano Navale	IAS	IA	IB	IC	ID

Icebreaker or ice-class vessel?

An icebreaker is purpose-built to navigate ice-covered waters and provide safe waterways for other vessels.

Ice-class vessels operate in first-year ice where a fairway channel is continuously broken by shipping, and refrozen.

For many ice-class vessels, the application of a certified ice coating can reduce the required steel plate thickness.

Hempadur Multi-Strength GF 35870

for higher efficiency and lower maintenance

Traditional ice coatings are designed around two main properties: superb impact and abrasion resistance to combat cracks and scratches from packed or floating ice, and low ice friction to reduce the build-up of ice on the vessel's hull and superstructure.

For lighter-weight ice-class vessels, however, this is not enough. Due to their thinner hulls, these vessels are more prone to dents, which can lead to cracks in the coating. This means they require an ice coating with the flexibility to bend with the steel beneath, which is why Hempadur Multi-Strength GF 35870 is already used by more than 150 ice-going vessels.

A pure epoxy ice coating, Hempadur Multi-Strength GF 35870 delivers extremely low ice friction to increase your fuel savings across the entire docking interval. It also offers exceptional impact resistance and abrasion resistance.

Unlike many other ice coatings, Hempadur Multi-Strength GF 35870 is reinforced with glass-flakes to ensure exceptional impact and abrasion resistance, as well as the flexibility needed to bend if the steel dents. As a result, you get fewer cracks and lower long-term maintenance requirements.

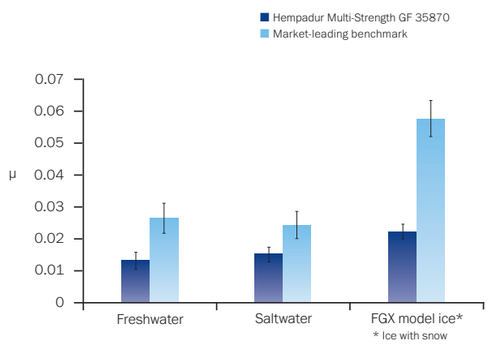
The benefits of Hempadur Multi-Strength GF 35870

Higher operating efficiency and lower fuel consumption

- Up to 60 per cent less ice friction than other leading ice coatings (as confirmed by Aker Arctic Technology)
- Less build up of ice on the superstructure and hull
- Smooth surface to assist ice slip
- Lower maintenance requirements
- Significantly higher abrasion and impact resistance compared to other leading ice coatings
- Improved flexibility to reduce cracking on thinner hulls

Shorter out-docking times

- Applied with standard spray equipment in temperatures as low as 5°C / 41°F
- No complex and expensive heated dual-feed equipment
- Applied in a single direct-to-metal coat
- Improved feathering properties reduce need for grinding and sweeping
- Ready for immersion in seawater after just 6 hours at 20°C / 68°F



"Based on the test results, it seems that the friction of Hempadur Multi-Strength GF 35870 is lower than the friction of the reference paint in all ice conditions. The effect of the about 50 per cent decrease in friction is rather significant for ship performance, and should cause a decrease in the order of 5-15 per cent in total resistance of the ship in ice."

Aker Arctic Technology

Certificates

Proven performance

Hempadur Multi-Strength GF 35870 has been proven to perform on more than 150 ice-going vessels. In addition, it holds NORSOK M-501, rev.5, approval and is certified by Lloyds Register and Aker Arctic Technology.

- Certified as a Recognized Abrasion Resistant Ice Coating by Lloyds Register
- Certified as an Extremely Low Friction Coating in All Ice Types by Aker Arctic Technology
- NORSOK M-501 approved

Hempadur Multi-Strength GF3587B is certified by the Russian Maritime Registry of Shipping: it complies with the requirements of Part XIII of the Rules for Classification of Sea-going Ships.

- Certified as a Recognized Abrasion Resistant Ice Coating by Russian Maritime Register of Shipping

Testimonial

Hempel ice coating helps Rosatomflot (Russia) reducing operating costs, without compromising in performance

Rosatomflot was looking for an easy-to-apply ice coating that would lower its operating expenses without compromising performance. The answer was Hempadur Multi-Strength GF 35870.

The challenge
Rosatomflot's fleet of nuclear icebreakers ensures the Northern Sea Route is available to shipping year-round. The company had been using an industry-leading ice coating for its icebreakers; but it was searching for an easy-to-apply alternative ice coating that would deliver the same – or better – performance.

The solution
Hempadur Multi-Strength GF 35870 can be applied with standard spray equipment in temperatures as low as 5°C / 41°F, which significantly reduces Rosatomflot's application and repair expenses. Rosatomflot applied Hempadur Multi-Strength GF 35870 to one of its icebreakers in 2015, and it showed excellent performance. As result, Rosatomflot decided to apply Hempadur Multi-Strength GF 35870 on three more nuclear icebreakers of its fleet in 2017, **M/V Vaygach, M/V 50 Years of Victory and M/V Taymyr.**

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Since 1915 Hempel has been a world-leading coatings specialist, providing protection and inspiration to the world around us. Today we have over 5,500 people in 80 countries delivering trusted solutions in the protective, decorative, marine, container, industrial and yacht markets. This includes many recognised brands like Crown Paints, Schaepman and Jones-Blair.

Hempel is proudly owned by the Hempel Foundation, which supports cultural, humanitarian and scientific causes across the world.

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