

Selektope®

The solution for
sustainable
marine fouling
protection.



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Our vision is for Selektope to be the preferred solution for sustainable marine fouling protection

Selektope provides unique, repellent action with non-fatal effect on the barnacles.

Selektope is effective in ultra-low concentrations, markedly reducing biocidal leaching from painted hulls to marine environments.

I-Tech - developers of Selektope®

Selektope®

Selektope is an organic, metal-free active agent added to marine antifouling paints to prevent barnacles from settling on coated surfaces by temporarily activating the swimming behaviour of barnacle larvae. This bio-repellent effect makes Selektope the only type of technology of its kind available to the marine paint manufacturers.

Barnacle fouling is very detrimental for ship fuel consumption, emissions and invasive aquatic species transfer. The use of antifouling paints containing Selektope significantly reduces fuel consumption, which contributes to lowering emissions. It also enables ship operators to unlock financial savings associated with lower fuel bills and lower maintenance costs associated with hull cleaning.

Depending on the formulation, Selektope can also help to reduce emissions to water by reducing biocide release with up to 90 percent compared to other antifouling paints, without negatively impacting the performance of the paint.



I-Tech

I-Tech is a global biotechnology company operating in the marine paint industry. The company has developed and commercialised the product, Selektope. With Selektope, I-Tech is uniquely the first company to ever apply principles from biotechnology research in the marine paint industry to keep ship hulls free from marine fouling.

“Barnacles can cause an increase of fuel consumption of over 40% and with an increasing risk of fouling, the problem has grown to new levels. Selektope is the natural alternative today and for the future.”



An ocean of opportunities

>500

Vessels

Currently protected by an antifouling coating containing Selektope



36%

potential power savings

A vessel with 10% barnacle coverage would need a 36% shaft power increase to maintain the same speed.*



>20

billion USD

In fuel-savings potential connected to fouling on the hull.



>100

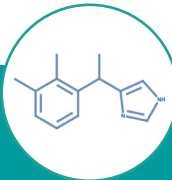
million tonnes CO₂

Fuel savings potential relating to fouling on the hull corresponds to 0.3% of the global CO₂ emissions.



* Adapted from Schultz et al (2011)

Selektope highlights



Selektope is a small molecule with huge possibilities. It is used in ultra-low concentrations and can therefore coexist with all existing biocides and other ingredients. It is powerful enough to be used as the core biocide, but is also flexible enough to boost existing formulations. Read more on pages 14–15



Next step - the leisure boat market. I-Tech, together with US paint manufacturer Pettit Marine Paints, will develop a series of high-performance antifouling products for the leisure boat market.



Protected healthcare at sea. Global Mercy, The world's largest civilian hospital vessel, is protected by Selektope®. I-Tech has donated the necessary volumes of the antifouling ingredient to the organisation Mercy Ships. Read more on pages 22–23



Powered by Selektope. Selektope is offered through a range of high performing antiifouling coatings by some of the biggest marine paint manufacturers. The coatings have been adapted for a wide selection of different types of vessels and operation patterns.

A sustainable solution. Selektope keeps the ship hull clean with a unique non-lethal mode of action, which in return will reduce emissions to air and sea as well as prevent the spread of invasive species. Selektope opens possibilities of paint formulations with less biocodes, and therefore less leaching of biocides to the marine environment. Read more on pages 18–21



Effective during the hardest conditions. Selektope prohibits barnacle settlement regardless of vessel activity or area of operation. Read more on pages 10–12



Proven efficiency. Selektope has provided power to antifouling coatings used on over 500 vessels. The oil product tanker, Team Calypso, was the first vessel to be protected with a Selektope-enhanced antifouling coating. Even after the ship sailed and laid still in high-risk areas for marine growth, during more than five years, the hull was still completely free of barnacles. Read more on pages 12–13

MARINE FOULING

A growing environmental problem

Marine biofouling is a biological process which immediately affects every surface submerged in sea water. Ship hulls attract different types of organisms, with barnacles as the main issue, but algae, bacteria and weeds also pose a problem. Over time, a thick layer of fouling can form on the ship hull which significantly increases friction against the water when a ship is sailing. This leads to major consequences for the shipowners. Marine fouling is not only a problem for ships, it also affects all types of marine installations.

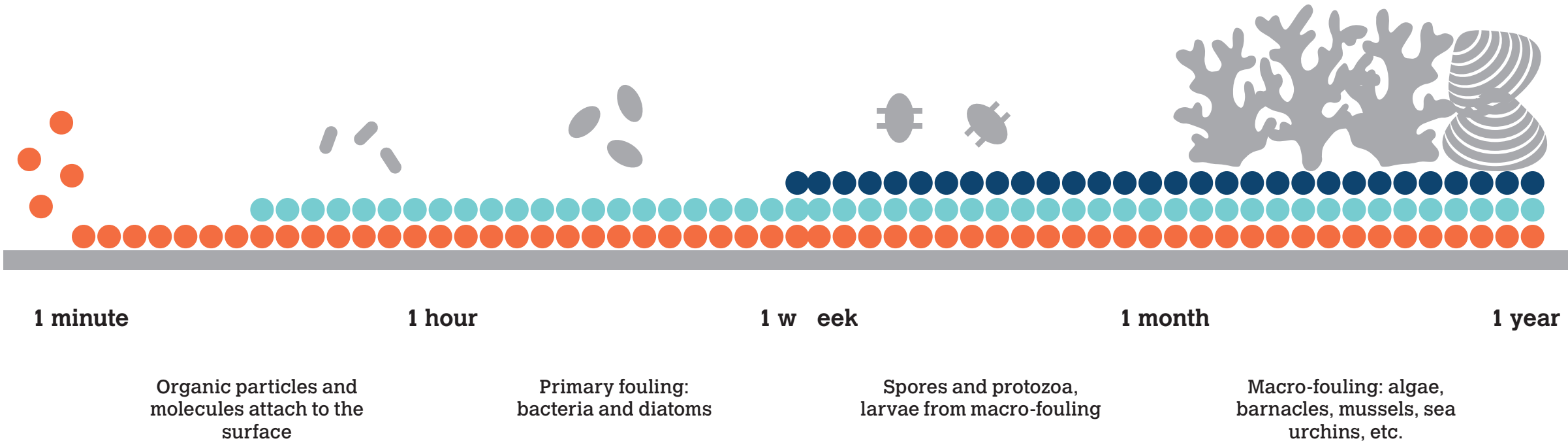
Marine biofouling and its consequences is an age-old problem which has existed for thousands of years. Over 1,700 species pose a fouling risk in all global waters. Marine fouling is normally divided into two main categories:

Hard fouling – usually shell building organisms and animals with a large effect on the surface structure. Barnacles are the main species and the biggest problem for ships. They are a sort of crustacean that like to settle on boat hulls, where they immediately build a protective calcite shell. The age and size of the barnacle has a correlational effect on the friction; the longer it has settled, the bigger the friction against the water.

Soft fouling – bacteria and algae that attach to exposed surfaces within a couple of hours. After a couple of weeks, these are often defined as slime or seaweeds.

The scale and extent of marine fouling depends on the temperature of the water and the availability of light and nutrition. Fouling takes place significantly faster in warm, tropical waters. Ships exposed to longer periods at anchor waiting for cargo or access to port face a larger risk of fouling than those that are moving.

Costly removal increases risk for new fouling
Marine fouling also means that ships need to be cleaned regularly by divers or underwater robots. This is difficult to carry out on hulls without damaging the antifouling and increasing the risk for additional fouling. Fouling generates direct operating costs for cleaning services, as well as missed cargo revenue as the ship must be stationary while being cleaned. Ocean-going ships are usually dry docked every three to five years. Avoiding extra cleaning during the period in between dry docking creates significant financial savings since each cleaning can cost between USD 15,000 to USD 45,000 depending on the size of the ship.



FOULING PROTECTION DEMANDS

Global trends calls for effective antifouling

As marine fouling on the hull increases, so does the friction between the ship and the water. This must be compensated by increased power output from the engine, which leads to higher fuel costs and increased carbon dioxide emissions. These extra fuel costs are so high that they can make the difference between profit and loss for a shipping company.

To avoid the financial and environmental problems that comes as a result of biofouling, investments for antifouling products with exceptional performance is essential, non the least due to the global trends impacting the shipping industry.

1

Increased global sustainability ambitions

Starting on 1 January 2020, the UN governing body for international shipping, IMO, introduced global requirements for reduced fuel sulphur content to reduce sulphur emissions. The IMO has also set a goal that international shipping must cut its carbon dioxide emissions by at least 40% before 2030, compared to the base year 2008, and that greenhouse gas emissions must be reduced by at least 50 percent by 2050.

However, low-sulphur fuels or alternative fuels such as methanol or LNG are generally significantly more expensive than traditional heavy fuel oil (HFO), which can lead to increased fuel costs of 50 percent or more.

Result: The sustainability goals mean an increased focus on fuel consumption and fuel costs. Requirements for cleaner more expensive fuel results in even more focus on reducing fuel consumption, for example with low friction between hull and water. To reach the emission targets, effective antifouling becomes increasingly important.

2

Increased pressure from interest groups

Shipowners are facing strong pressure from groups of financiers, shipping banks and charterers, such as the interest groups Poseidon Principles and SeaCargo Charters. Both initiatives are major steps to drive sustainable issues in the shipping industry and it is likely that more players will join in the coming years.

Poseidon Principles
Behind the initiative is a large group of world-leading shipping banks that have gathered around a new global framework for sustainable shipping financing.

Sea Cargo Charter
Launched in 2020, the initiative is setting new objectives for responsible chartered shipping, transparent climate reporting and improved decision-making in line with the UN's CO₂ emissions targets. The initiative is founded by some of the largest industrial companies that use global shipping services.

Result: Powerful interest groups mean increased focus on fuel consumption and environmental impact by shipping companies and are an incentive to drive the choice of high-performance antifouling products.

3

Increased transports in warm waters

Due to changing production patterns with more and more companies locating production in Asia, the shipping routes of freight vessels are also being moved to more equatorial latitudes. This increases the time for freighters in warm waters where the risk of growth is greater than in colder waters.

Result: Increased growth leads to an increased need for effective antifouling.

4

Biofouling hotspots

Global warming is increasing water temperatures in the world oceans. This leads to higher risk of marine fouling, such as barnacles on ships, and to more difficult conditions for the shipping industry. A recent study shows that 44% of a group of 249 vessels had more than 10% of the hull covered by barnacles.

Result: To protect vessels operating in biofouling hotspots, an effective antifouling treatment on more ships is essential.

5

World crises force vessels to idle.

An extensive study conducted in 2021 by I-Tech and marine data analysts Marine Benchmark, including all IMO-registered vessels, shows that most vessels will be forced into idling periods with high risk of hard fouling during their operation periods. The study also showed that global crises have high impact in forcing vessels into idling periods. For example, when comparing 2020 with 2019, overall idling increased with 200%. COVID-19 caused reduced quantities of transported goods and the world was hit by an oil crisis that resulted in stationary tankers.

The study showed that that idling-crisis, such as that of 2020, is not unique, over the past 12 years, we have seen at least 3 peaks of idling due to unforeseen circumstances. Factors such as lack of infrastructure in ports, strikes, wars and other trouble spots are all factors forcing ships to lie at anchor.

Result: High risk of idling directly links to high risk of hard fouling. To be prepared for idling periods ship owners need to invest in effective antifouling coatings. Selektope has proven efficiency during the hardest conditions such as long idling or out-fitting periods in tropical waters.

At the same time as global trends are fundamentally impacting the shipping industry, the risks associated with marine fouling are increasing as are the costs for the extra fuel consumption it generates. This leads to increased demands being placed on efficient antifouling, such as those containing active antifouling agent Selektope®

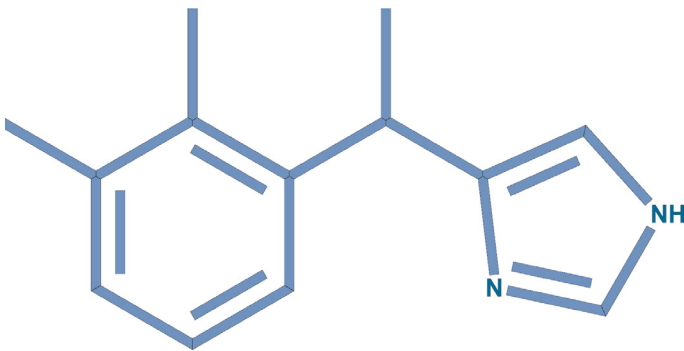
Next generation antifouling

Selektope is an organic molecule developed by I-Tech over more than 20 years. Selektope’s powerful, repellent effect on marine fouling keeps the ship’s hull clean—which reduces frictional resistance between the ship’s hull and water, reducing fuel consumption and emissions.

The organic molecule, Selektope, is a pioneering and innovative solution that offers marine paint companies a more sustainable alternative to traditional antifouling products.

The power of Selektope

Selektope® is a biocide with a unique mode of action, repelling barnacle larvae from submerged surfaces in ultra-low concentrations. Selektope’s unique characteristics offer marine paint companies numerous possibilities to formulate high-performance, antifouling paint systems for ship hulls with reliable and continuous protection against barnacles. Selektope can also enable increased protection against other marine fouling. Selektope builds on advanced biotechnology in marine paints where, when Selektope leaches out from an antifouling paint, barnacle larvae are temporarily affected as they approach the hull surface. The larvae become hyperactive and cannot attach to the surface of the hull, instead they are forced to swim away and find another place to settle.



Along with only seven other substances, Selektope is approved, for use in antifouling, according to the very comprehensive EU biocidal legislation, the EU-BPR. Selektope is also approved for use in a number of other countries, including China, Japan and South Korea where a majority of all antifouling paints are applied.

Considerable reduction of biocide leakage

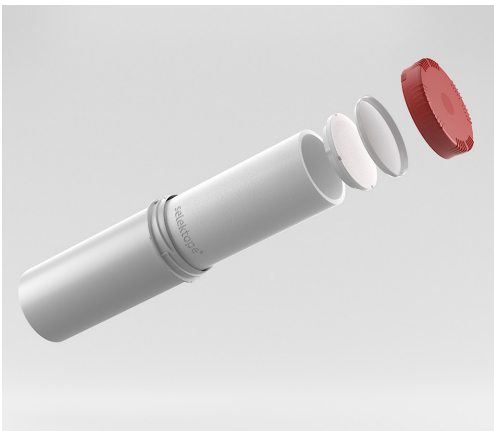
Selektope is a technology characterised by its selective action and enormous efficacy even at extremely low concentrations. This creates new opportunities, that in some cases, can reduce biocide release from a paint by more than 90 percent compared to traditional antifouling paints, whilst still improving the hull performance.

No side-effects on paint properties

The effect of Selektope on a paint system is in most cases insignificant, which means that the paint and its application method are not affected. Selektope gives I-Tech’s customers greater freedom to formulate different types of antifouling products. For example, it is possible to formulate Selektope with or without cuprous oxide, and functional materials can also be formulated. For example, the Chukogo product, SEAFLO NEO CF-PREMIUM, in which all cuprous oxide is replaced, shows a particularly good ability to also reduce soft/primary fouling. To date, there are more than 10 commercial products on the market that contain Selektope.

Selektope’s contribution

- Selektope contributes to positive environmental impact in several stages when the product’s characteristics are used to full effect:
- Reduced emissions to the air.
 - Reduced biocidal leakage into the marine environment.
 - Reduced transfer of invasive species.



With its own soluble packaging solution, Selektope can be added directly into the antifouling paint production system and is dissolved immediately. This innovative approach minimises the risk of exposure at the paint manufacturing facilities which contributes to a better work environment.



EU-BPR-approved

Along with only seven other substances, Selektope is approved, for use in antifouling, according to the very comprehensive EU biocidal legislation, the EU-BPR. as well as by the corresponding authorities in Japan,

After risk evaluation, Selektope®, as one of only a handful active agents, has been approved as environmentally acceptable

Selektope in paint

Selektope is an ingredient technology in paint systems which binds to various pigment particles that are evenly distributed in the paint. As the paint is polished off, there is a constant amount of Selektope in the paint’s surface, ready to continuously repel the barnacle. Long development times for antifouling paints are required to achieve a balanced polishing speed of the paint under all conceivable operating conditions and water temperatures, as well as to have a linear release of biocides.



When a barnacle larva comes into contact with Selektope, the larva becomes hyperactive and performs about 100 kicks per minute. In this way, the larva simply cannot attach to the surface. The effect is reversible, and the larva quickly returns to its normal state when not exposed to Selektope.



Image by:
Chugoku Marine Paints

Test-patch

A coastal ship in Japan after 12 months in operation with a test patch coated with antifouling paint containing Selektope. The ship had a low level of activity, i.e. long periods at anchor, in the area in and around Tokyo Bay, which is considered to be an area of intense marine fouling. The result on the test area is to be contrasted with the hull in general which uses an antifouling paint without Selektope, albeit adapted for the current operating conditions. The increased resistance through the water is estimated to be 60% or more due to the fouling.

Barnacle-free after 5 years in operation

After 5 years of operation, the first ship fully coated with a Selektope-containing antifouling paint went in for regular maintenance at a Chinese shipyard. The hull was completely free of barnacles, this after the ship both sailed and laid at anchor in high-risk areas for hard fouling and the growth of barnacles.

M/T CALYPSO:

Type:
chemical/oil product
tanker
(46067DWT IMO II)

Name:
M/T Calypso / Team
Calypso
(IMO: 9411290)

Size:
27061 GR Ton, 183 m.

Built:
2010

Painted with:
Selektope-containing
antifouling paint:
November 2015

Antifouling product:
SEAFLO NEO CF
PREMIUM

Shipyard:
Singapore yard
Sembcorp.

Dry docked:
February 2021

Place:
Port of Nansha, China

Thanks to Selektope in the antifouling paint, the vessel's hull has received outstanding protection against barnacles, even at anchor and low speeds (below 6 knots) in biofouling 'hotspots' with high water temperatures.

In November 2015, the vertical sides and bottom of the tanker hull were painted with a 60-month Selektope-containing and copper-free antifouling product at the Sembcorp shipyard in Singapore.

Thereafter, the vessel was in active operation over a wide range of global routes for a period of 63 months. The vessel has frequently sailed in high-risk areas for marine growth. It has also spent long periods at anchor in these zones, generating an extremely high risk of hard fouling by barnacles, whose larvae find the hull of a ship prime settlement.

With only minor growth of barnacles on the hull, the friction against water will increase and negatively affect the ship's fuel consumption, or if the vessel runs on a fixed shaft power, the fouled hull will result in speed loss.

To confirm the efficacy of antifouling agent Selektope, Molflow's AI-ship modelling tool "Slipstream" was used to analyse Calypso's hull

performance. Calculations from this analysis shows that the average yearly speed loss between December 2015 - January 2021, was smaller than 0.5% (0.06 kn). The speed loss analysis confirms exceptional performance of the hull through water.

During most of its operation, Calypso was operated by Team Tankers who has reaped the benefits of the high performing antifouling coating.

Capt. Pär Brandholm, Senior Performance & Technical Manager at Team Tankers International comments: "After operating predominantly in tropical and sub-tropical regions, the fact that the average weighted speed loss is significantly lower than for other vessels in our fleet, is hugely impressive – and will have a tangible impact on fuel costs and emissions."

I-Tech's CEO, Philip Chaabane, comments on Team Calypso's strong results.

"Despite the fact that Team Calypso has been active in the harshest conditions for marine fouling for the past 63 months, data on the ship's sustained performance show that the Selektope-containing antifouling paint has helped maintain the ship's efficiency. The owner of this tanker has reaped the benefits from the fuel savings that can be associated with the power of Selektope's ability to protect the hull from barnacles. Data analysis and inspections of the hull provide strong evidence that proves Selektope's high-performance protection against hard marine fouling, regardless of the ship's activity or movement patterns."

The ship's hull was never cleaned during the promised service life of the paint technology. In addition, Calypso laid at anchor off the coast of China for 1 month before dry docking. During this month, the hull was exposed to a very high risk of hard marine fouling.

When the ship was taken to dry dock and inspected in February 2021, after 63 months of operation, there was no growth of barnacles.



When the ship was inspected in a dry dock in February 2021, after 63 months of operation, the hull's paint showed a normal amount of wear but there was no growth of barnacles.

Powered by **selektope®**

SOLUTION ENABLER

Formulate with Selektope®

Selektope is a small molecule characterised by its high efficacy at extremely low concentrations as it stimulates the octopamine receptor at the barnacle larvae. This unique level of power can be brought into most coating formulations.

Powered by **selektope®**

i

I-Tech are dedicated to make Selektope® easy to use and to provide as much advice as possible on formulation concepts to give the best possible start in exploring the full range of benefits. With the completely unique and innovative Selektope solution and I-Tech's expertise, a great deal of trust has been built with customers and shipowners. We invest in staying one step ahead of understanding formulation challenges and opportunities. On the market today there are formulations in which biocide loadings have been substantially reduced as the hard-fouling spectra of fouling is fully in hands of Selektope. As this requires a different platform to start off from, the vast majority of coatings on the market use Selektope® as a booster next to existing ingredients and biocides. The way of formulating is fully up to the R&D team.

Solution enabler

How to mix antifouling paint to achieve the best possible benefit from Selektope can pose major challenges for paint manufacturers. In recent years, I-Tech has built up a team with extensive experience and expertise with the aim to further develop the company's commitment to customers' product development work, to achieve an increased integration of Selektope in the end products. By utilising the knowledge that exists in the company, conceptual paint formulations can be developed that contribute to making the paint manufacturers' development work easier.

Compatibility is key

Selektope® is used in ultra-low concentrations and can therefore coexist with all existing biocides and other ingredients.

It is powerful enough to replace actives and it's flexible enough to boost existing formulations. Selektope® enables new ways of formulation as well as giving formulators the tools to improve the performance against algae and slime. Selektope® can be used in most coating formulations where other biocides are used today and does not give rise to any extra application procedures. The ability to overcoat, drying times or weather conditions during application are not affected by Selektope.

How to formulate with Selektope

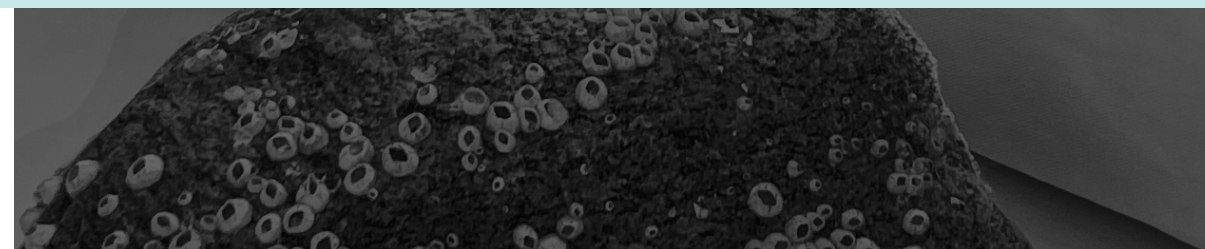
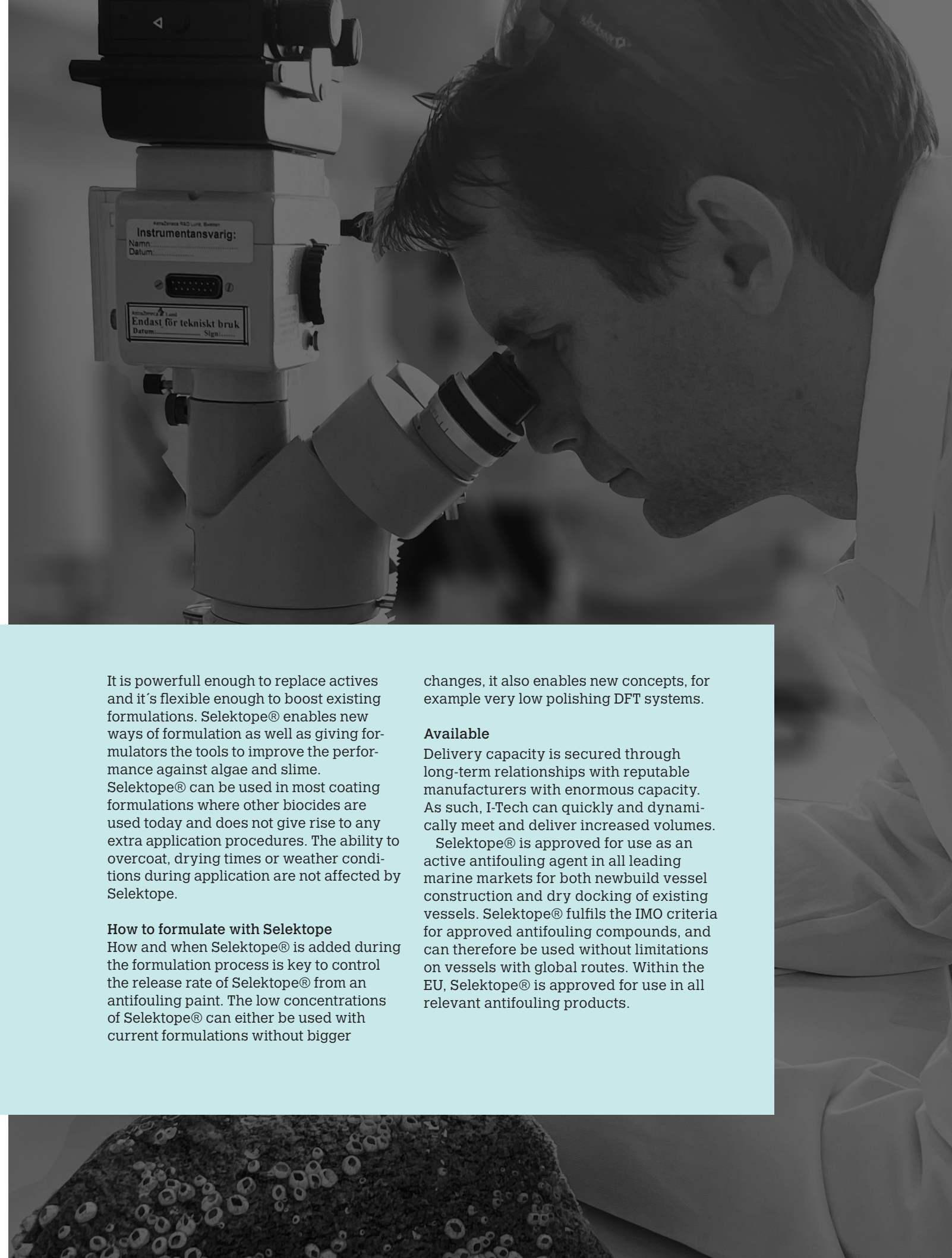
How and when Selektope® is added during the formulation process is key to control the release rate of Selektope® from an antifouling paint. The low concentrations of Selektope® can either be used with current formulations without bigger

changes, it also enables new concepts, for example very low polishing DFT systems.

Available

Delivery capacity is secured through long-term relationships with reputable manufacturers with enormous capacity. As such, I-Tech can quickly and dynamically meet and deliver increased volumes.

Selektope® is approved for use as an active antifouling agent in all leading marine markets for both newbuild vessel construction and dry docking of existing vessels. Selektope® fulfils the IMO criteria for approved antifouling compounds, and can therefore be used without limitations on vessels with global routes. Within the EU, Selektope® is approved for use in all relevant antifouling products.



REDUCED EMISSIONS

The shipping industry’s climate impact

Increased fuel consumption and associated increased emissions are a growing problem for the global shipping industry. Besides the negative impact on the environment, increased fuel consumption also brings financial stress for shipowners.

Today, the global shipping industry is responsible for approximately 2.3% of total global CO₂ emissions – as much as the aviation industry.

At the same time, the shipping industry accounts for about 85 percent of the world’s transports of commercial goods. If globalisation and consumption continue to increase at the same rate, according to the European

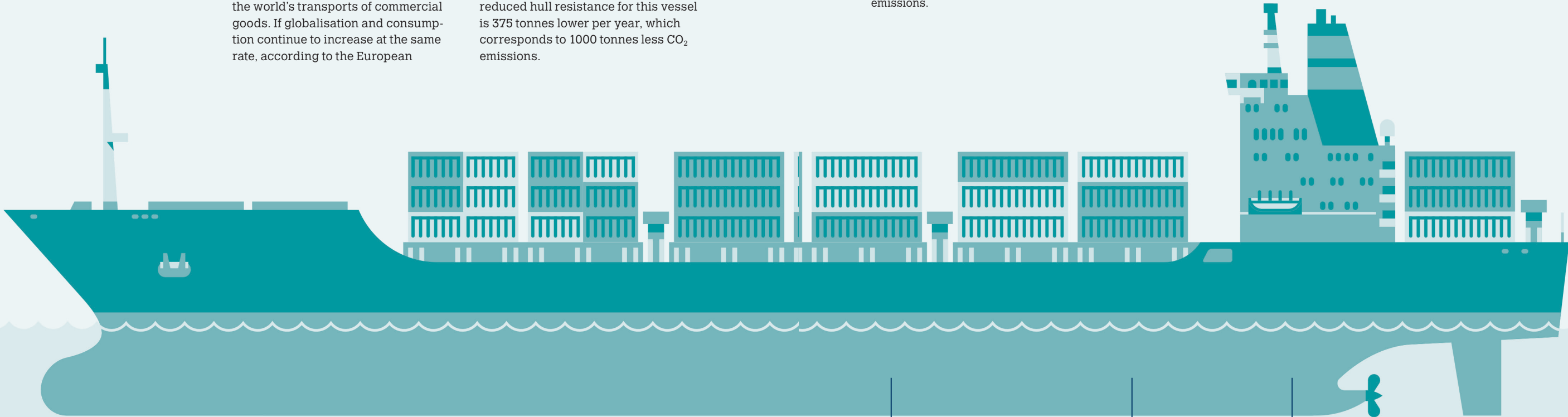
Environment Agency, shipping’s share of global emissions could amount to as much as 17 percent by 2050.

This is how much fuel production can be reduced

Case studies show that, protecting the hull with a Selektope-containing antifouling coating generally leads to lower fuel consumption. The reference vessel in one study halved its hull resistance compared to an equivalent product. Fuel consumption due to the reduced hull resistance for this vessel is 375 tonnes lower per year, which corresponds to 1000 tonnes less CO₂ emissions.

1,000 tonnes less CO₂ emissions

Fuel consumption due to the reduced hull resistance for this vessel is 375 tonnes lower per year, which corresponds to 1000 tonnes less CO₂ emissions.

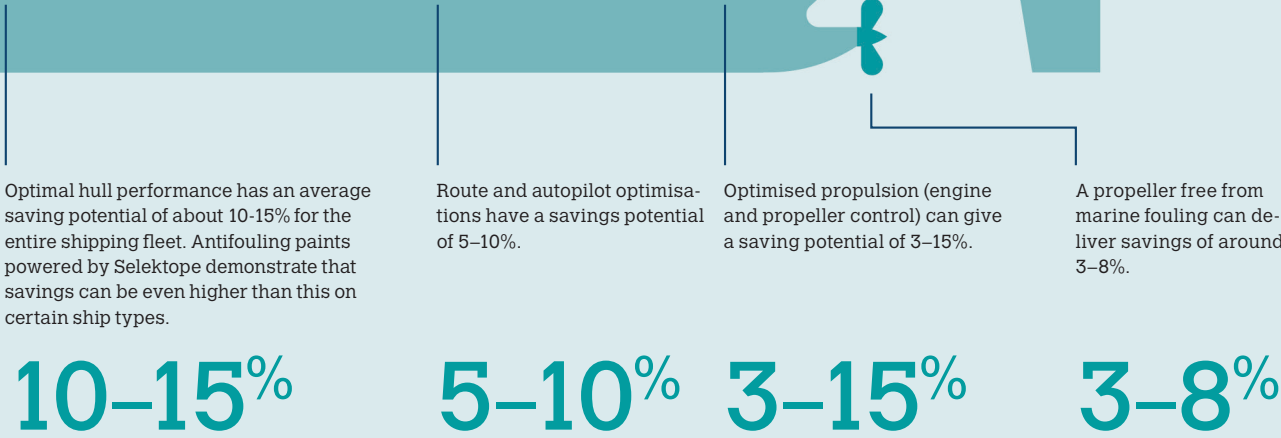


• The shipping industry must, through mandatory rules adopted by the IMO in 2018, decrease their emissions of greenhouse gases by 50 percent compared to 2008 levels by 2050. This provides a strong incentive for shipowners to invest in measures which have a positive effect on the environment and reducing fuel consumption.

• Since January 1, 2020, IMO has introduced global requirements for lower sulphur emissions in the shipping industry. This means that shipowners must use a larger proportion of low-sulphur fuel, which demands a higher cost. Optimal hull performance will therefore contribute to an even greater financial savings potential.

• The commercial shipping fleet has several possible options for improvements, with a low investment barrier and a short repayment period (see illustration).

• Other efficiency measures that can be applied, depending on operating conditions are a new bulbous bow, upgrading of propellers, a new rudder, sail/wind rotors, waste heat recycling systems, alternative fuels, etc.



Sustainability challenges for marine transports

1

High fuel consumption leads to high emission levels

Each year, the shipping industry consumes 350 million tonnes of bunker fuel oil. The industry accounts for, on average, roughly 2.3 percent of the world's global CO₂ emissions – about the same amount as the aviation industry.

Marine fouling on the hull increases friction against the water. To compensate for the friction and maintain the desired speed, fuel consumption increases. As little as 10% coverage of hard marine fouling, such as barnacles, requires a 36% increase in shaft power to maintain the same speed thru water and about the same increase in fuel consumption.

Opportunity

Hull performance can be optimised using effective antifouling paint containing Selektope. With the right antifouling paint on all cargo ships, CO₂ emissions could decrease by 100 million tonnes each year, and the total financial savings potential could reach USD 20 billion per year.

2

Increase in invasive species – a threat to biodiversity

In recent years, the spread of invasive aquatic species has become an increasing threat to biodiversity. Failure to protect a ship and its hull against marine fouling increases the risk of invasive aquatic species attaching to the hull. When ships carrying biological hitchhikers arrive at new ports, these species, for example: invasive crabs, oysters, etc. negatively disrupt the animal life and existing ecosystems at the destination.

Opportunity

Stricter fouling restrictions have been introduced regionally in ports, with fines or refusals as a consequence to reduce the spread of invasive species. By using an effective anti-fouling paint, for example containing Selektope, the hull is kept clean and the problem of the spread of invasive aquatic species can be curbed.

3

Leakage from antifouling paints has an environmental impact

Traditional antifouling generally uses active biocides, which make up anything from a few percent to more than half the weight of the paint. These biocides gradually leak into marine environments.

Opportunity

Unlike traditional ingredients in antifouling paints, Selektope has a specific effect that enables it to be used in uniquely small concentrations. The use of Selektope-containing anti-fouling paint can therefore significantly reduce biocide emissions into the sea. On top of being efficient in low concentrations, Selektope is also biodegradable over time.



Selektope® paves the way for large environmental benefits

The savings from effective antifouling systems are estimated at more than 100 million tonnes of carbon dioxide for the entire shipping industry annually. As such, Selektope has enormous potential to contribute to sustainable development at sea. Sustainability is an obvious part of I-Tech's business model that strives to work in an ethically, socially and environmentally responsible manner, and to ensure sustainable innovation

How Selektope can assist in reaching the UN's global development goals



9 Sustainable industry, innovation and infrastructure
Technological development and innovation are crucial for creating sustainable solutions to the world's economic and environmental challenges as well as contributing to more efficient use of resources. For I-Tech, developers of Selektope, it is obvious to focus on a sustainable industry where research, more environmentally friendly technology and innovation are fundamental components.



12 Responsible consumption and production
Sustainable consumption and production is necessary to reduce the negative impact on the climate, environment, and on people's health. This includes using resources efficiently, taking account of ecosystems, and reducing negative impact of chemicals. I-Tech has a high focus on a safe production chain and has developed a desolving package for safe use in the paint making process. For shipping, using Selektope is beneficial to protect marine ecosystems both by reducing the transfer of invasive species and also by making it possible to reduce biocidal leakage from hull paint by more than 90%.



13 Climate action
Climate change is one of the greatest challenges of our time. If greenhouse gas emissions continue, climate change will cause serious consequences for ecosystems, food production, water supply, human safety and health, while increasing the risk of natural disasters. Through I-Tech's innovation, Selektope, emissions of greenhouse gases are reduced, one vessel at a time.



14 Life below water
Protection and restoration of coastal and marine areas are key measures to preserve biodiversity and fishery resources, and also to strengthen resilience to climate change. 70 percent of the planet is covered by oceans and how they are managed is crucial in the fight to balance the effects of climate change. Selektope can contribute to the protection of marine ecosystems by reducing the transfer of invasive species on fouled hull, as well as by reducing biocidal leakage from antifouling paints to marine environments.

Three sustainable focus areas

1

Sustainable innovation

Selektope was developed with sustainability in focus within a research project specifically designed to develop marine fouling protection for the future. I-Tech has since continued to work in the same spirit and further refined its knowledge. Together with customers, Selektope has opened up possibilities to create more effective antifouling products. I-Tech integrates good business practice, legal commitments and protection of people and the environment in all strategic decisions and in day-to-day work.

Among other things, I-Tech is investing in exploring the possibilities to minimise leakage of Selektope without affecting the antifouling effect. As large resources have been invested in Selektope, in terms of knowledge and also in terms of production, an expansion of the areas of use is also an important part of the sustainability strategy.



2

Sustainable production

Since 2017, Selektope has been manufactured by two large capacity producers in Asia. With a majority of Selektope-containing paints being manufactured in Asia, logistics have thereby been streamlined. The manufacturers, who also supply products to some of the world's largest pharmaceutical companies, have been selected after extensive evaluation processes. They work systematically with quality, environment, work environment and subcontracting requirements, and are certified according to ISO 9001, ISO 14001 and ISO 45001/OHSAS 18001.



An important part of I-Tech's sustainability strategy concerns emissions from the production of Selektope. I-Tech works continuously to minimise the emissions generated during the process, from raw material production and energy supply to waste incineration.

For safe handling of Selektope, a special soluble container has been developed for the paint making process.

3

Sustainable environment



Using Selektope to power up the antifouling coating is environmentally beneficial in several ways.

Compared to other biocides used in traditional antifouling paints, Selektope provides a unique, repellent mode of action with non-fatal effect on barnacles.

With a clean hull, resistance between the ship and water reduces, leading to less fuel consumption and greenhouse gas emissions. To reach the global emission targets set out for the shipping industry, a clean hull is key.

In recent years, the spread of alien, so-called invasive species, that hitchhikes on fouled ship hulls have become an all greater threat to biodiversity. Using an effective antifouling paint containing Selektope contributes in reducing the spread of invasive species.

Selektope also works beneficial to the marine ecosystems by reducing biocidal leakage from painted hulls. Since Selektope has a powerful effect on barnacles in ultra-low concentrations, biocodes can be significantly reduced in the paint formulation.

CASE

Hospital ship protected by Selektope

Mercy Ships is a global charitable organisation whose volunteers provide medical treatment and undertake urgent operations onboard hospital ships docked at local ports in some of the poorest countries in the world. The charity, which has helped people in need for over 40 years, operates onboard the converted passenger ship, Africa Mercy. During 2021, a new, purpose-built hospital ship, Global Mercy, will enter into active service and more than double their capacity to provide help those in need.

GLOBAL MERCY:

Type:
Passenger ship
Name:
GLOBAL MERCY
(IMO: 9726499)
Size:
36 600 GR Ton, 174m
Built: 2020
Painted with:
Antifouling paint
containing Selektope:
2020
Shipyard:
Tianjin Xingang,
China

The proliferation of COVID-19 has put a heavy strain on the already fragile healthcare system in Africa, making Mercy Ship's mission to strengthen healthcare systems more important than ever.

"We not only carry out surgical operations and rehabilitation on board, but we are also an important player through our healthcare education initiatives where local doctors and surgeons receive training in new technologies, new methods and routines for increased safety," explains Tomas Fransson who is Sweden Manager for Mercy Ships.

The new purpose-built hospital ship, Global Mercy, is a unique vessel equipped with 6 operating rooms, 102 emergency care beds and 90 self-care beds. Onboard there are also state-of-the-art training facilities, including a VR and AR-supported simulation laboratory for surgeons. The ship accommodates a crew of up to 641 volunteers and treats around 2,500 patients during a ten-month period in port.

Protected with Selektope

The contract to build Global Mercy was awarded to the Xingang shipyard in Tianjin, China in 2014, with Stena RoRo appointed by Mercy Ships as project manager. When considering the hull coating for the Global Mercy, Stena RoRo selected an anti-fouling coating containing Selektope® that would protect the hull from hard fouling during extensive static periods. In support of the charity's vital work, I-Tech AB has donated the required volumes of Selektope® to Mercy Ships.

For any ship spending time at anchor for extended periods, the risk of barnacle colonisation on the hull is very high. The nature of the voluntary aid Mercy Ships provides means that its hospital ships are often stationary in port for up to 10 months. This means that barnacle fouling could be a costly nuisance for Mercy Ships, both due to increased fuel costs when the hospital ship is sailing between ports due to increased frictional resistance on the hull, in addition to costs associated with drydocking the ship to mechanically remove hard fouling, if required.

"Mercy Ships has, of course, an extensive sustainability profile, and I-Tech's donation in support of our assignment further contributes to being able to carry out our work in a more sustainable way," says Tomas Fransson. He continues, "The use of the latest technological innovations to protect Global Mercy against fouling during static conditions is of great importance to us. It's also a fun story that the active ingredient in Selektope is a molecule that is also used in the pharmaceutical industry. Medetomidine is used as a sedative for veterinary purposes and one of the ingredients, dex-medetomidine, is widely used by our anaesthetists on board.



Stena RoRo decided to use an antifouling paint containing Selektope to protect the hull from hard fouling during the long static periods when Global Mercy stays in port.

Powered by **selektope®**



selektope®

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Selektope®

Selektope is an organic, metal-free active agent added to marine antifouling paints to prevent barnacles from settling on coated surfaces by temporarily activating the swimming behaviour of barnacle larvae. This bio-repellent effect makes Selektope the only type of technology of its kind available to the marine paint manufacturers.

I-Tech

I-Tech is a global biotechnology company operating in the marine paint industry. The company has developed and commercialised the product, Selektope. With Selektope, I-Tech is uniquely the first company to ever apply principles from biotechnology research in the marine paint industry to keep ship hulls free from marine fouling.