

Case Calypso

Proven power of Selektope®



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 marine fouling by barnacles, whose larvae find the hull of a ship prime settlement when vessels are at anchor or moving at slow speeds (up to 6 knots).

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. This analysis shows that the average yearly speed loss, while in service protected by a Selektope containing paint, 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. In a performance review of the fleet, Team Tankers compared Team Calypso to 9 of its sister vessels, Team Calypso's speed losses then turned out to be significantly lower than the other tankers. Using Selektope in the coating has therefore brought great financial benefits for the operator.

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, neither mechanically nor with divers. 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, the hull's paint showed a normal amount of wear but 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**[®]

Reliable during operation

1

Painted in Sembcorp Yard, Singapore

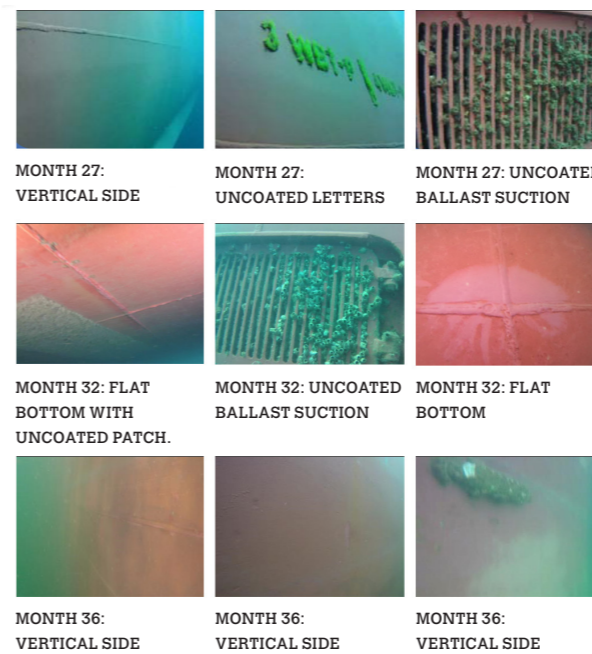
Calypso was painted with the Selektope-containing antifouling coating: SEAFLO NEO CF-PREMIUM from Chugoku Marine Paints.



2

Ongoing inspections during operation

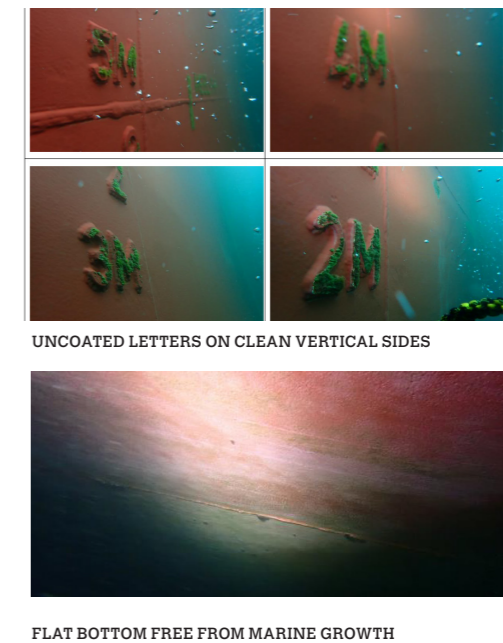
Inspections and vessel performance proves the efficiency of the Selektope-containing antifouling coating.



3

58 months - underwater inspection

Satisfying results during the last underwater inspection prior to the dry dock, After 58 months of operation - the hull was free from barnacles.



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. 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.

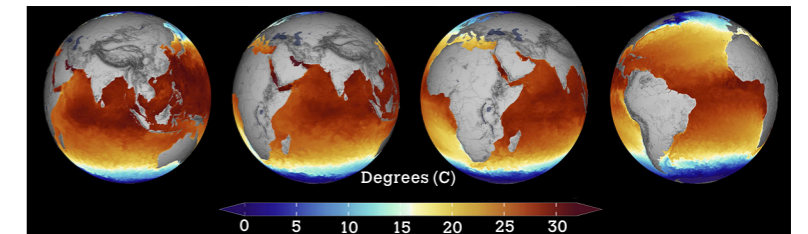
Marine biofouling and its consequences are an age-old problem. The problem has existed for thousands of years. Over 1,700 species pose a fouling risk in all global waters. Marine fouling is normally divided into two main categories:

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.

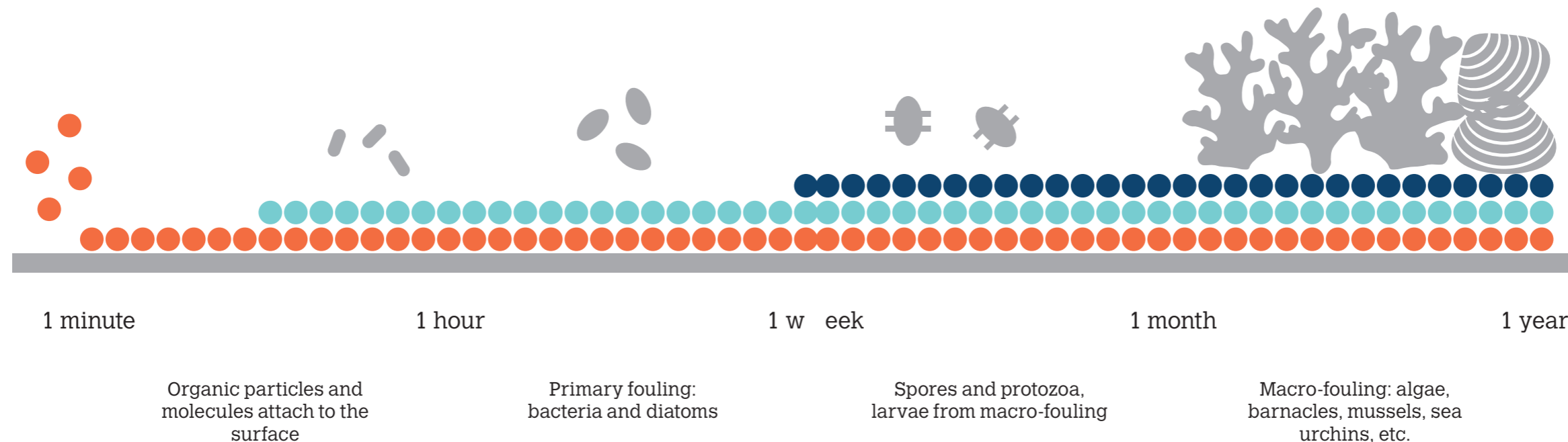
Biofouling hot-spots

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. Water temperatures of above 25 degrees are often classed as biofouling "hot-spots". Ships exposed to longer periods at anchor face a larger risk of fouling than those that are moving. With global ocean temperatures rising, biofouling hotspots become more widescale, so more ships could be finding themselves in one of these regions, facing a new, higher risk of barnacle fouling.



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.



63 months of operation and protection from the power of Selektope®

The savings from effective antifouling systems are estimated at more than 100 million tonnes of carbon dioxide for the entire shipping industry annually. Calypso has been reaping great benefits from using the active antifouling agent Selektope.

M/T Calypso performed with minimal speed loss.

When analysing the speed loss of Calypso during the time period of December 2015 to January 2021, when Calypso was operating with a Selektope containing paint, the conclusion is that friction and speed loss are significantly lower than industry average and the hull performance is exceptionally good. The low speed loss indicates a smooth, non-fouled hull with low friction between hull and water.

Data shows an average speed loss of less than 0.5% (0.06 kn) per year. The analysis was performed using Molflow's AI-ship modelling tool "Slipstream", the aim of the ship data model is to predict the vessel's true speed over ground at any loading condition in any weather condition by training multiple Neural Network models to describe the vessel's behaviour at certain points in time and comparing their predictions for calm atmospheric and oceanic conditions.

The performance degradation of M/T Calypso was evaluated to be comparable to the in-service performance indicator of ISO 19030 (see figure). The average speedloss of Calypso, of less than 0.5%, is significantly smaller than what is commonly known within the industry as a benchmark for average speed loss, set to around 6%.

In addition, the performance of Calypso exceeds the best speed loss guarantees of premium coating systems by far, which are set at around 1.2 % speed loss.

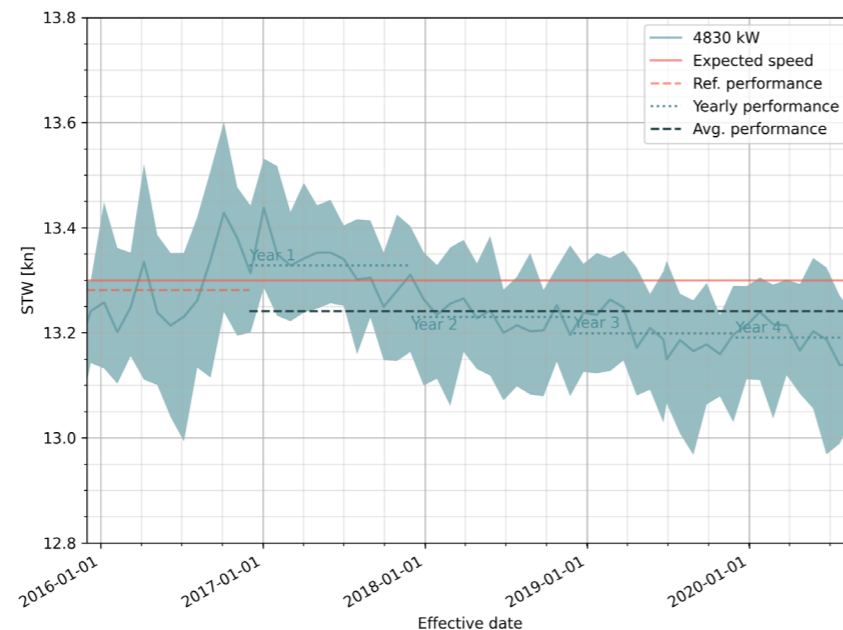
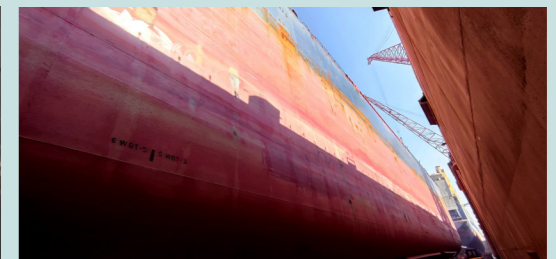
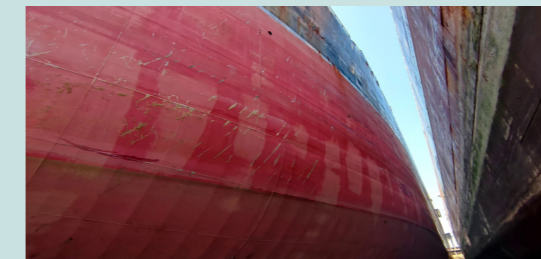


Figure: Speed loss evaluation of M/T Calypso. The speed losses are measured as the difference in knots of each evaluation period to the reference period. The average performance of the first year following the dry-docking was calculated and used as a reference performance. The average performance of each year following the reference period, as well as the average performance of the entire period following the reference period was calculated.

Proven efficiency during the full coating life span

Free from barnacles

During the hull inspection after 63 months of operating and idling in warm waters, the hull showed a normal amount of wear, but was free from barnacles.



Routes and activity

Calypso has been operating and idling in global routes including high risk areas for marine fouling. High water temperatures and long periods at anchor are significantly increasing the risk of marine biofouling.

Based on data provided by Marine Benchmark, the activity and seawater temperatures of Calypso's trading routes has been analysed.

Calypso has sailed in water temperatures of above 25 degrees, also known as biofouling 'hotspots', for about 15% of its operation (between Dec 2015 - Dec 2020).

Calypso has been laid idling for more than 14 days on 5 separate occasions, 3 of these idle periods being in water temperatures of above 25 degrees, exposing the hull to extremely high fouling pressure.

Contact:

Please contact us with any enquires or questions.

Email: info@i-tech.se

Phone: +46 (0)10 30 33 999

Web: www.selektope.com

If you would like an in-person presentation about I-Tech and Selektope, contact us to schedule a meeting.



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.



Selektope is an organic, metal-free active agent added to marine anti-fouling 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.