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# ECOLOCK® ultra long-lasting protection for offshore hulls



**E**colock is designed to protect offshore vessels for decades without the need for drydocking. Increasingly, offshore units such as FPSOs, FSOs, FLRSUs and others used for offshore oil and gas exploration, drilling, storage and transport need to stay out of drydock for 15, 25 even 40 years.

The challenge has been to protect the underwater hull from corrosion and to provide a cleanable surface so that the biofouling that accumulates can be removed successfully and safely for UWILD and to reduce weight. Ecolock is the answer to that challenge.

Ecolock is an extremely tough and durable coating designed to remain

in excellent condition for 15 - 25 years without drydocking, repair or replacement. Ecolock can be cleaned underwater as often as needed to meet the UWILD and weight requirements of FPSOs, drill ships and other offshore vessels. Ecolock is the result of continual R&D on offshore hull coatings since the 1990s.

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# Promising results of Ecoshield test in hopper of Dutra's TSHD *Stuyvesant*

**T**esting of Ecoshield on the Dutra Trailing Suction Hopper Dredger *Stuyvesant* shows that the coating promises to be a viable solution for protecting the hopper of a dredger.

## Dutra and the *Stuyvesant*

The Dutra Group is a leading US heavy civil and marine contractor headquartered in San Rafael, California. Its three divisions, Dutra Dredging, Construction, and Materials, work together to strengthen the US infrastructure through sustainable dredging and marine construction. The TSHD *Stuyvesant* plays a major role in the Group's ability to dredge long and wide waterways.



*The Trailing Suction Hopper Dredger Stuyvesant is an important element of Dutra Group's fleet.*

The *Stuyvesant* is a 113 meter, 8,432 GRT dredger, US-built by Avondale Shipyard in 1981 and converted in 1994. The dredger can operate in

both tropical and arctic conditions, has deep dredging capabilities and is suitable for working in coastal waters. The hopper has a capacity of 8,520 cubic meters and the vertical hopper walls guarantee fast and effective dumping of sticky materials.

## Abrasion, wear and Ecoshield

Dredgers generally experience high wear as a result of their normal activities. In the case of the *Stuyvesant*, this occurs mainly on the flat bottom and inside the hopper.

In general, the hopper of a dredger is not coated, as the usual protective coatings will not be able to withstand the abrasion of the constant flow of sand and dredged material and will simply turn tail and vanish, leaving the steel to face the elements unprotected. Then, when the dredger



*After grit blasting the inside of the hopper, the pitting and weld seams show need of repair.*



*Ecofix, a filler compatible with Ecoshield, is used to repair the welds and pitting.*



*The first coat of Ecoshield applied.*



*Second coat of Ecoshield.*

arrives for its routine drydocking, it is a matter of estimating how much steel has been lost and repairing or replacing it. The idea of applying a highly abrasion-resistant coating was therefore novel.

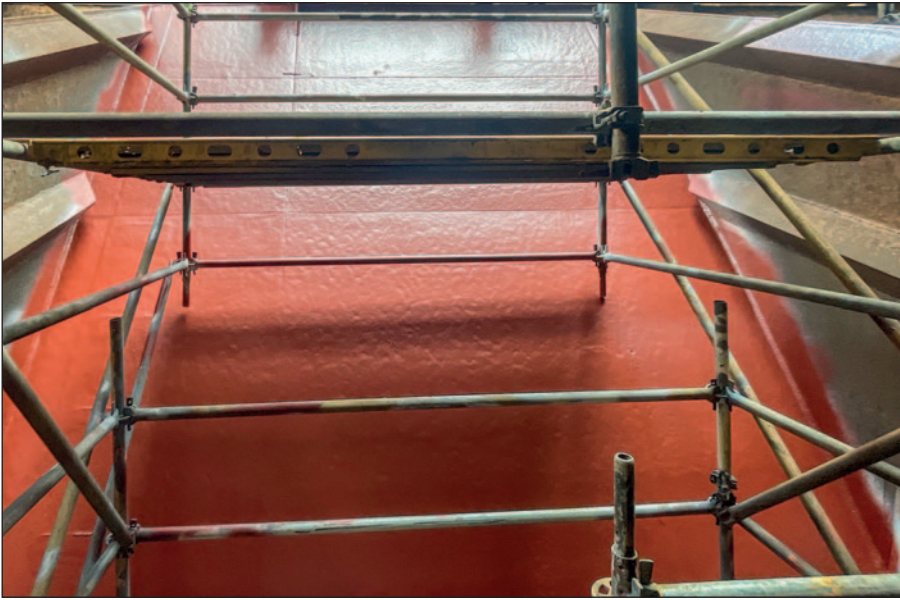
To try to mitigate some of the wear and reduce the need for steel replacement and repair, in August 2022 Dutra Fleet Manager Iain Searle decided to run tests of Ecoshield on parts of the *Stuyvesant* that were particularly prone to abrasion damage. A test patch of Ecoshield was applied to the bottom and another test patch inside the hopper.

Ecoshield has a long, proven track record as the most durable protective coating for rudders and running gear available. But there has not been such a long track record of protecting the inside of dredger hoppers. This is a new application for Ecoshield, and the results so far are very promising.

### **Hopper preparation and Ecoshield application**

A section of the interior slope of hoppers port and starboard were chosen for the test. Preparation of the area to be coated consisted of grit blasting to SA 2.5 and a roughness of 124  $\mu\text{m}$  average (75 $\mu\text{m}$  minimum roughness is required). Pitted areas and welds were then repaired with Ecofix, a sister product to Ecoshield. Ecofix is a compatible filler for pitting and surface damage which is often used prior to the application of Ecoshield.

Two coats of Ecoshield were then applied, first coat white, second coat red. Ecoshield can be applied just one hour after Ecofix has been used to repair the damage. The second coat of Ecoshield can be sprayed on



*Completed hopper with two coats of Ecoshield.*



*The hopper Ecoshield test patch after 10 months of active duty is in excellent condition.*

three hours after the first coat, and there is no maximum overcoat time. DFT for the hopper test patch averaged 1477  $\mu\text{m}$  with a minimum of 920  $\mu\text{m}$  and a maximum of 1994  $\mu\text{m}$ . The required DFT is at least 1000  $\mu\text{m}$ .

### **Ten months later**

Inspection of the hopper was carried out in mid-June 2023 which is 10 months after application. The dredger had been in normal use during that period. The bottom photo on this page is of the inside of the hopper. The Ecoshield test patch is the red section.

The photo shows the state of the coating after 10 months. Some mechanical damage to the coating is visible on one side, probably caused by stones or a metal chain or tube. It is important to note that such damage to the coating can very easily be repaired without loss of quality of the coating. In other words, repaired spots are as strong as the original layers. Overall, the coating is all in place and looking surprisingly good, considering the constant barrage of dredged material to which it is subjected. Clearly since the coating is intact, no damage to the steel has occurred and there has been no erosion or corrosion.

Dutra Fleet Manager Iain Searle was very pleased with the results. "To be honest," he said, "I was expecting it to be gone in a few weeks, so I am surprised it is holding up at all."

Based on the success of the initial testing, Dutra is now considering applying our coatings to the entire hopper at the next drydocking. ■

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# Ecoshield ideally suited for thruster tunnel protection

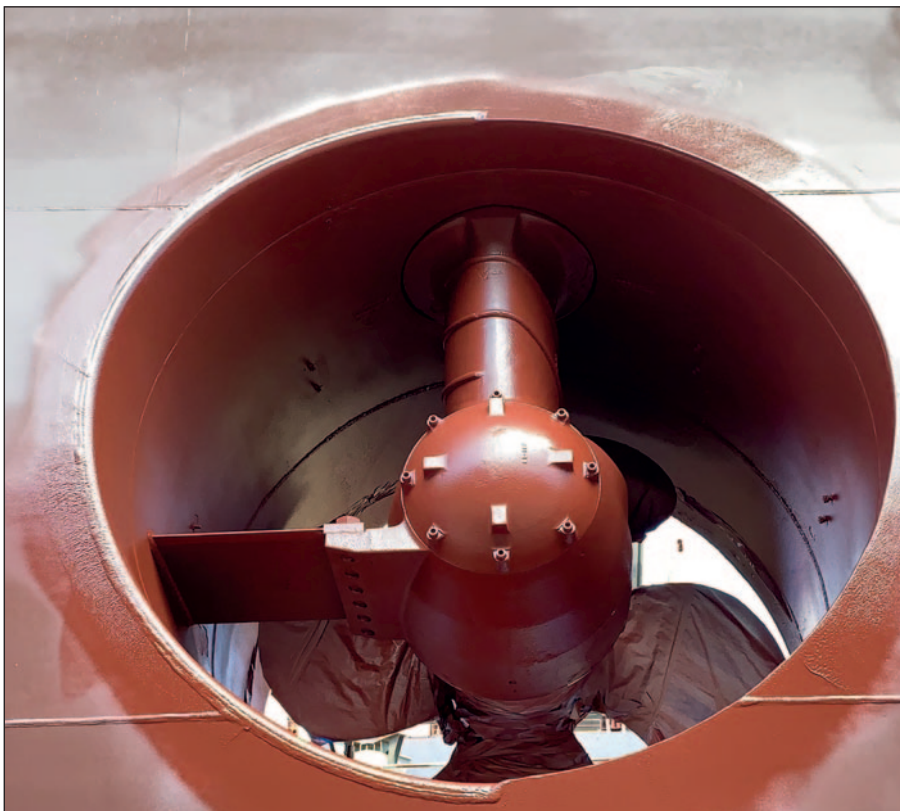
**B**esides offering rudder protection, Ecoshield is also suitable for all underwater ship gear which needs special protection from corrosion. The extra strength coating protects these areas for the service life of the ship. Good examples of this are the many thruster tunnels which have been coated with Ecoshield with great success.

In most cases companies begin by coating one rudder experimentally, only to go on and order Ecoshield for all the running gear in their fleet after seeing the results in service.

Grit blasting, and application of the two layers is always done in the presence of one of our inspectors. The timing is geared to the schedule



*Ecoshield application on thruster tunnel. No repaint will be required during future drydockings.*



*All running gear can be given lasting protection against cavitation and corrosion damage with our Ecoshield coating.*

of the yard. This flexibility can be easily achieved with Ecoshield because the coating has a minimum overcoating time of only three hours, and no maximum. This allows for the possibility of applying either of the two required layers at any time during the building process.

Ecoshield has been tested on running gear since 2002 with extraordinary results. Ships that were experiencing heavy cavitation damage to their running gear have seen no further cavitation damage erosion. Some of them have been sailing for well over 15 years after application with no sign that the coating will need replacement. ■



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# SUBSEA

PROTECTION AND PERFORMANCE



**S**ubsea Industries NV, was founded in 1983 specifically to take care of the design, development and marketing of what has become an evolving line of underwater hull and propeller

cleaning equipment as well as the line of hard hull coating systems.

All products produced by Subsea Industries have the same goal in

mind: To keep the underwater part of your vessel in the best possible condition for its entire lifetime at the best possible performance.

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