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The issue of coatings

Economically, the growth of organisms on the hull of a ship will mean trouble. Ships move slower through the water, consuming more fuel and thus increase costs for a ship owner. Several companies share their coating products and knowledge with Maritime by Holland Magazine.

Jotun is a leading global producer and distributor of coating systems, delivering to several industries, including marine and offshore. From buildings to bridges to vessels and offshore structures, there are almost no areas that go untouched by Jotun's coatings. Marc Groenewoud, account manager offshore at Jotun, states: "Our scope of products covers a complete range of coating systems offering our clients the right product for each situation. As part of a total solution Jotun employees are helping their clients to protect property during the whole lifecycle of their property."

SeaQuantum and Baltoflake

When asked to mention one of their best-known products, Marc Groenewoud states that their SeaQuantum range is one of the best antifouling available on the market. A good antifouling prevents the growth of organisms on a ship's hull making sure that the ship will maintain its speed and at the same time reduce fuel oil consumption. Marc Groenewoud: "Our SeaQuantum range is an advanced antifouling containing environmentally acceptable biocides. Not only used within the marine industry - e.g. fast sailing container vessels and tankers - but also on static structures in the offshore market, were the coating has a guaranteed stay of at least five years, fouling-free. Another key product in our product scope is Baltoflake, a NORSOK prequalified coating system. This coating gives offshore structures high-end protection against abrasion and corrosion in the most hostile environments, with more than three decades of excellent track record."

The offshore industry is an extremely demanding market, but Jotun has made name for themselves within this industry and their coatings now protect hundreds of offshore structures worldwide.

Self adhesive foil

"Dry-docking could be a thing of the past with Thorn-D", states Eric Pieters, commercial director at Micanti. The fairly young company, located in Amsterdam, the Netherlands, is the producer of Thorn-D, a new and revolutionary antifouling. "Thorn-D can be even placed on the vessel underwater in case of necessity, saving companies time."

"We started in 2005 due to the need for environmentally friendly antifouling technology", states Rik Breur, managing director at Micanti and also the inventor of Thorn-D. "Our product is a patented non-toxic antifouling foil designed to be a physical barrier against bio-fouling. You could compare the product to a kind of grass-carpet, which is applied to the vessel as a foil instead of paint like coating. The 'carpet' has very specific short fibers, around three millimetres long, that makes the surface of your vessel become prickly and very unattractive for organisms who whish to attach themselves." Thorn-D was first tested on fish farming nets. The warmer the water, the more growth is to be expected. Fish farming is done in warm and cold waters and offered Micanti a good place to start the introduction of Thorn-D. The nets are always in the water and the fish are fed every five minutes, making these environments highly susceptible to the growth of organisms on the net.

Good test results

Pieters: "After the initial testing, the Thorn-D now has an excellent track record and has kept the fish farming nets clean for six seasons, which is a good five years. An amazing accomplishment. Plus, we have noted that there is no effect on the defensive system of the Thorn-D, meaning it should be able to last much longer." The product was tested and Micanti felt the test results were very encouraging. Breur: "We also needed to make sure that the product would not let go. Thorn-D was tested on high speed vessels and they have also shown excellent results as well, with test going up to 30 knots. Next to that, we know it has zero maintenance for at least five years. This could be more, but we know five years is a definite measure." The company's focus is now on the fish farming and the shipping industry and they are also looking into the offshore industry. Moreover, Micanti wishes to expand the range in vessel-size. Pieters: "The huge positive fact about D-thorn is that is 100% environmentally friendly. Also, it does not take much time to apply. A standard vessel will be 'foiled-up' in about four hours. Larger or more difficult vessel may take 24 hours. "

Hard coating, low maintenance

Low-maintenance and environmentally friendly are also key factors for Ecospeed, a coating product produced by the Belgian Hydrex company. Manuel Hof, production executive at Hydrex states: "Hard coatings, like Ecospeed, are very durable. They can withstand time and are good substances to use in, mainly, cold waters."

Ecospeed is a system which combines a non-toxic durable hard coating and regular underwater cleaning. The Ecospeed coating will be affected by marine growth after a while. The frequency required to clean the hull depends on certain factors, such as water temperature and the vessel's trading area. Colder waters mean less growth of organisms on a vessel due to lower temperatures. Ecospeed is therefore very suitable for ice-going vessels where less cleaning is required. The Ecospeed coating is not an antifouling like the conventional systems that leach biocides into the aquatic environment polluting the oceans. Hof: "Ecospeed has an expected lifetime of 25 years, making intermediate dry-docking periods easy for maintenance. Only touch-ups from mechanical damage are required. Extensive spot repair or repainting of the hull is therefore not necessary. Ecospeed is a system based on easy maintenance and full benefit for the owner because of its strength and durability. By implementing and monitoring cleaning operations the owner obtains predictable fuel consumption for the following years. Thanks to the fact that Ecospeed contains no toxic particles, the cleaning can be done under water while the vessel is waiting in the port. Dutch authorities have conducted stringent tests and concluded that no toxic or harmful material is released during cleaning the Ecospeed surface. As a result the law regarding underwater cleanings in the Netherlands was changed specifically for Hydrex. Ecospeed is the only coating that may be cleaned in Dutch ports as no toxic material is released into the water. This was a major breakthrough, especially when you consider that there was a total ban on underwater cleaning in the ports of the Netherlands for almost 20 years. The only maintenance required for Ecospeed is cleaning and some very minor repairs during intermediate dry-dockings."

Ecospeed is much used in the cruise industry because of the recurrent trading schedule of cruise vessels, making it easy to schedule and carry out in-water cleaning. Hof: "Somewhere around four cleaning sessions a year is standard. We evaluate the cleaning needs at least once a year in order to ensure the best cleaning schedule and frequency. This may result in alternating a full hull cleaning with cleaning of only the vertical sides. Our goal is to offer the client the most efficient maintenance schedule with maximum benefit. An underwater cleaning with a double team of the entire underwater surface of a 200 metre vessel can be done in a reasonably short time. We aim for the carwash-feel, less dry-dock time.

Ballast water tank coatings

As mentioned, bio-fouling is not the only problem for vessels. Corrosion is another phenomenon that can have severe consequences. Corrosion is not something that is solely attributed to the outside of vessels. Did you know ballast water tanks cover 40% of a vessel's surface, meaning that the coating that prevents corrosion within the tank is of utmost importance? TNO was approached by the Holland Shipbuilding Association as some Dutch shipyards voiced concerns about the coatings in their ballast water tanks. In 2012 IMO's performance standard for Protective Coatings (PSPC), stipulating a coating and the manner in which it is applied must meet strict requirements. TNO tested ballast water tanks on their sensitivity to corrosion in relation to the application method of the coating and if the ballast water management systems may harm the coatings within the tank. Part of the equation is the ballast water treatment system, which we have talked about on page 18, the other part is protecting the tank when it is filled with stagnant water. The PSPC demands that the coating in the ballast water tank offer 15 years of protection and requires the minimum of maintenance. Sibo Buter, project manager at TNO explains: "We tested the coatings and the application method in our laboratory and on board of vessels. The results were very positive and showed that not only was the coating and application thereof up to standard, but it even exceeded the requirements."

Fuel efficient hull coatings

TNO at its Maritime Material Performance Centre in Den Helder has a long standing tradition in antifouling research. With current emphasis on emission reduction and lowering of fuel costs, key aspect in the research programme is drag performance of hull coatings. Lab-based tests with the friction disk machine can be used to unravel added drag properties of various degrees of fouling on different types of coatings and surfaces. In combination with ageing studies also long-term drag performance of coatings can be investigated. This way relevant information on fuel efficiency of hull coatings can be obtained.

Whatever suits the vessel, there are many kinds of coating to be found. It all depends on where your priorities lie and what is economically viable. Standing still is not an option or the growth might get you.

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