Big data and ISO standard boost coatings benefits for box ships

Coatings are evolving under new standards and the expectations of the container ship industry

The ISO 19030 standard is changing the way the coatings sector operates and delivering potentially huge savings for container ship owners in the process. As a global standard, shipowners and other interested stakeholders can apply this to measure the hull performance of their vessels.

And this is just the start, as the ISO standard, published in 2016, is up for review in November this year.

An important contributor to developing the standard is Jotun's and DNV GL's annual HullPIC (Hull Performance & Insight conferences), which include stakeholders from across the industry. They highlight developments, challenges and advances that could help to further improve vessel performance and look at the role of the standard and how it can be developed.

Jotun A/S global concept director, hull performance solutions Stein Kjølberg tells Container Shipping & Trade "At these conferences, lots of interesting papers are put forward and it is not just paint companies and systems providers, but owners and operators speaking about their own experience."

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Speaking of the upcoming review, he says "I think there are a lot of interesting ideas to put on the table, such as separating the hull and propeller performance and measuring these separately." The standard does not currently differentiate between the two.

Speaking about uptake of the standard among ship operators, the news is positive. Mr Kjølberg says "More and more of our customers are adopting parts of the standard to establish their internal performance methodology. The intention was never to have the standard as 100% for everyone but to use this as a starting point for those who want to understand performance more."

He comments "Owners can develop their own methodology, but hopefully based on the ISO standard. The agreement on certain common principles does not stop innovation but at least means there is common terminology on what it actually means."

And container ship owners are among those who benefit most from the standard. Mr Kjølberg says "My personal opinion is that one of the ship sectors that benefits the most from it are container operators. They burn a lot of fuel and have to be precise as to when they arrive in port – any impact will affect that drastically."

A driver for using the standard among container ship operators is, he says, greater demand from charterers for vessels to meet certain performance criteria and more requests from them to upgrade.

He sums up "There is still a way to go, the market has huge potential to look into hull and propeller performance, learn from it and implement it in the most optimal way. That

is not necessarily to buy the most expensive paint system, but to at least upgrade and look at what kind of trade we have, what kind of charterers we have. A lot of customers do not have a full overview of all trades."

Jotun is looking into market performance and how it is affected by such factors.

Mr Kjølberg says "What we have learned is that our products really work when applied to the right parameters of the ship. We need to understand as much as possible about the ships, and the conditions of their trade routes."

He explains how two paint solutions could be used for one container ship. "We have to look at the sea water conditions to see how to maximise products for container ships. If there is high activity, a high sea temperature and a relatively high speed compared to a more diversified trade, different sea water temperatures and the ships passes between both trades, then this affects decisions on what paint to use.

"We spent some time looking at optimising combination systems and discussing this with owners."

Managing onboard paint

Jotun's chief executive Morten Fon has also spoken about the technological changes brought about by ISO 19030. He noted that Jotun's Hull Performance Solutions (HPS) offering combines premium SeaQuantum anti-fouling coatings with a suite of sensors to measure long-term performance in accordance with ISO 19030.

This provides documented proof of HPS' ability to maintain a clean hull, with a high performance guarantee promising hull speed loss of under 1.5% over standard drydocking periods, delivering increased fuel efficiency and consumption. For shipowners this translates to lower opex and CO2 emissions.

Mr Fon referenced the launch of Jotun's SeaStock Management Solutions in 2018 as a further step forward. This effectively allows Jotun to manage all onboard paint maintenance – including condition surveys, ordering and logistics – to ensure predictability, optimal quality and protection, and hassle-free administration.

He explained "It allows our customers to focus on what they do best, running their fleets, while we focus on what we do best – protecting people and property with world-leading solutions. It is simple, efficient and helps bring us closer, increasing understanding and performance. That is something we can all benefit from."

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That spirit of increased collaboration will be key in the future, Mr Fon believes, both for maritime and the broader ocean space.

"Data is a key issue," he stated. "Access to data will allow us to provide better solutions, while sharing data across relevant platforms will help the industry in general push for optimised performance, efficiency and regulatory compliance. Greater transparency will help give us all the ability to navigate what, in the past, has been an unpredictable industry. That is crucial."

AkzoNobel was also involved in forming the ISO 19030 standard.

Commenting on the value of the standard, AkzoNobel marine coatings business channel manager Michael Hindmarsh previously told CST "The standard was originally developed to try and harmonise the way ship performance is monitored. It draws a very good line in the sand. But it is just a start, and already people are talking about making it more accurate and improving it."

AkzoNobel sees a huge opportunity in applying big data to fouling control coating selection and using the ISO 19030 standard to prove the benefits. To this end, it launched its Intertrac Vision system in 2015; this is a predictive tool designed to help ship operators assess the return on investment resulting from a coating specification.

The iPad-based system processes individual vessel data and operational parameters that trained IP personnel enter during a free consultation. Multiple proprietary algorithms and models are then used to provide an accurate assessment of the impact of each potential fouling control coating choice over a ship's specified in-service period. Outputs include a vessel's powering requirement, fuel consumption, fuel cost, CO_2 emissions predictions and a full cost-benefit analysis, comparing different coating options and surface preparation options.

In 2019, Hempel launched a powerful biocide package and proven binder system. Atlantic+ is said to ensure progressive and controlled self-polishing from the moment the hull hits the water and for up to 60 months thereafter. The new coating is reinforced with Hempel's patented

microfibre technology at a higher level of the company's strongest cargo hold coating – Hempadur Ultra Strength Fibre.

Hempel said the science behind the microfibre technology involves introducing an internal skeleton of fibres into the paint to enhance its mechanical strength – in the same way that steel rods can be inserted into concrete to reinforce a physical structure. Strengthening the antifouling coating in this way means ensuring protection from fouling on areas exposed to impact and abrasion; improving overcoatability; reducing the areas to blast; and ultimately decreasing the costs for the ship's drydocking.

Coatings for ice-class

A physically more resistant hull coating is required for ice-class ships. PPG Protective and Marine Coatings has been working with the commercial shipping fleet, including crude oil and gas tankers working in the Russian Arctic. PPG has produced a solution that can be applied locally and is resilient enough for severe ice conditions.

PPG's Sigmashield 1200 coating provides protection from the impact of ice abrasion and accretion. Based on a very hard filler composition, the coating's anti-abrasion properties are built on a highly cross-linked phenolic epoxy technology, further extending the service life of the coating by increasing 'creep resistance'. This coating can also be applied by cold, single-feed airless spray equipment.

PPG said "It has a track record in protecting ice-going vessels, offering easy application as well as maximum abrasion resistance and damage propagation control against ice hazards on the hull's outer shell coating."

A subsequent diving survey of the ice-class commercial vessels after operation in ice-going conditions showed there was no damage on the coated vertical sides of the hulls as a result of ice impact.

I-Tech of Sweden holds the IP rights to Selektope, which is an anti-fouling paint ingredient. In a move that builds on the company's green credentials, I-Tech has developed a new 'drop-in, dust-free' dissolvable packaging system to enhance the way the antifouling active agent Selektope is added to marine coatings during the manufacturing process.

The expanded polystyrene (EPS) container, which can be added to paint without being opened, fully dissolves almost instantaneously without leaving any traces in the coating system.

This innovative packaging therefore allows for the dust-free charging of 100% Selektope powder material to a liquid paint batch, eliminating dust formation completely. It also allows the paint manufacturer to make optimal use of available Selektope and improves safety in the paint processing plant.

Each EPS container is supplied within a CurTec HDPE screw lid jar with a locking mechanism making it durable with improved impact resistance for transport.

The complete EPS container system can hold 300-800 g of medetomidine (the chemical name for Selektope) as a dry powder within an18-g EPS container.

The formal launch of the EPS container at SMM 2018 followed extensive testing with the packaging qualified for use during the manufacturing process without compromising paint performance.

I-Tech chief executive Philip Chaabane says "This latest innovation from I-Tech supports our customers in the safe use of Selektope and is a game-changer for the addition of biocides during the paint manufacturing process. In recent years, I-Tech has been successful in scaling up the production of its unique technology from quantities measured in kilos to a robust manufacturing platform producing at multiple tonnes scale." CST

ABOVE: Hempel's new Atlantic+ strengthens antifouling coating by ensuring protection from fouling on areas exposed to impact and abrasion