

WEBINAR

Coatings' key role in shipping decarbonisation

Tuesday 26 November • 10:00-11:00 GMT

Brought to you by

**marine
propulsion**
& auxiliary machinery

Sponsored by



PANELLISTS



Carl Barnes

Head of Marine Consulting
Safinah Group

**Coatings' key role in
shipping decarbonisation**

Sponsored by



Brought to you by





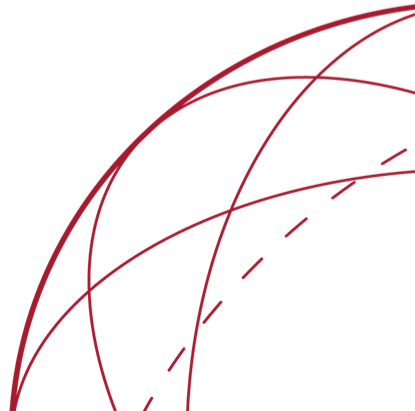
Safinah Group

360° Coating & Engineering Experts

Riviera Marine Coatings Webinar Week: Coating's Key Role in Shipping Decarbonisation

Carl Barnes

carl.barnes@safinah.com



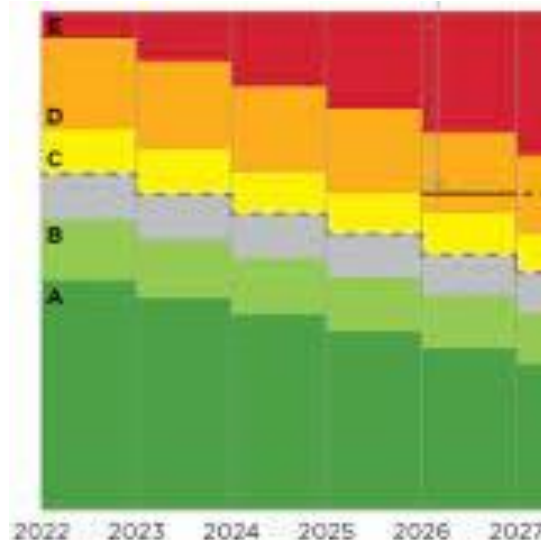
Impact of hull fouling

Consequences of biofouling

- Excess fuel consumption
- Increased GHG emissions
- Non-native (invasive) species transfer
- EEXI and CII

Hull coatings

- Fouling prevention
- Hull performance



Preliminary results Impact of Ships' Biofouling on Greenhouse Gas Emissions

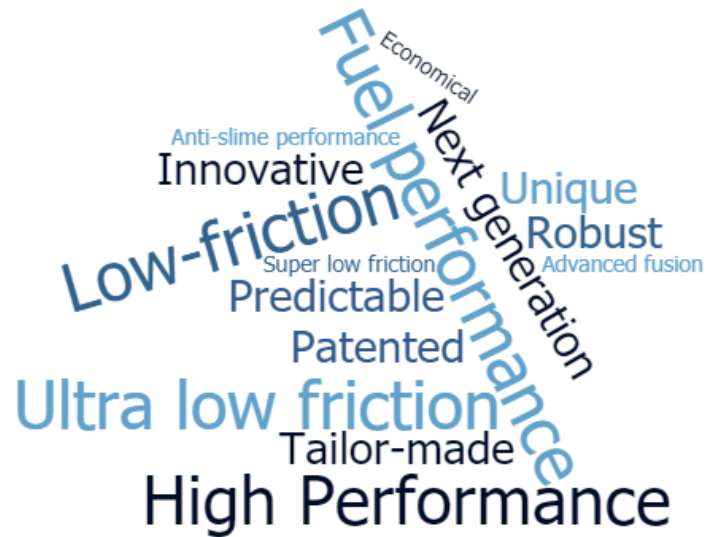


A thin layer of slime (0.5 mm) covering up to 50% of the surface can amount to **20 to 25% increase** in GHG emissions. A light layer of small calcareous growth could lead up to a **55% increase**.

Fouling control coatings

○ Performance and technology claims?

- Significant number of products.
- Can be complex and confusing.
- Does 'high technology level' products lead to improved performance?



Commercially available AFCs

Segment	Products
Marine	>150*

*Product name, further regional variations will be available



Dry Dock Data

○ Sample Definition:

- Data from coating supervision projects at drydock
- 800+ projects
- 200+ projects annually



Fouling control coatings

Selection and Performance

Coating Selection Trends:

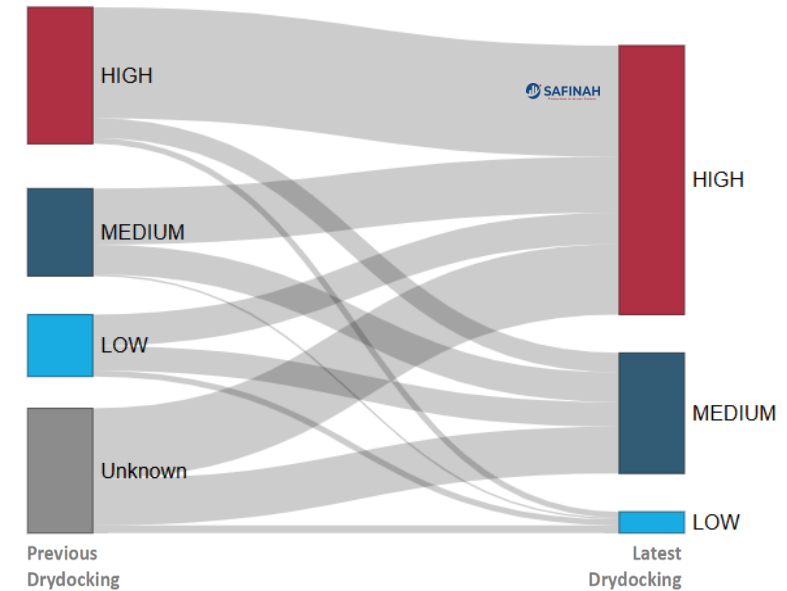
- Increase in a move to perceived 'high technology level' products.

Coating Performance Trends

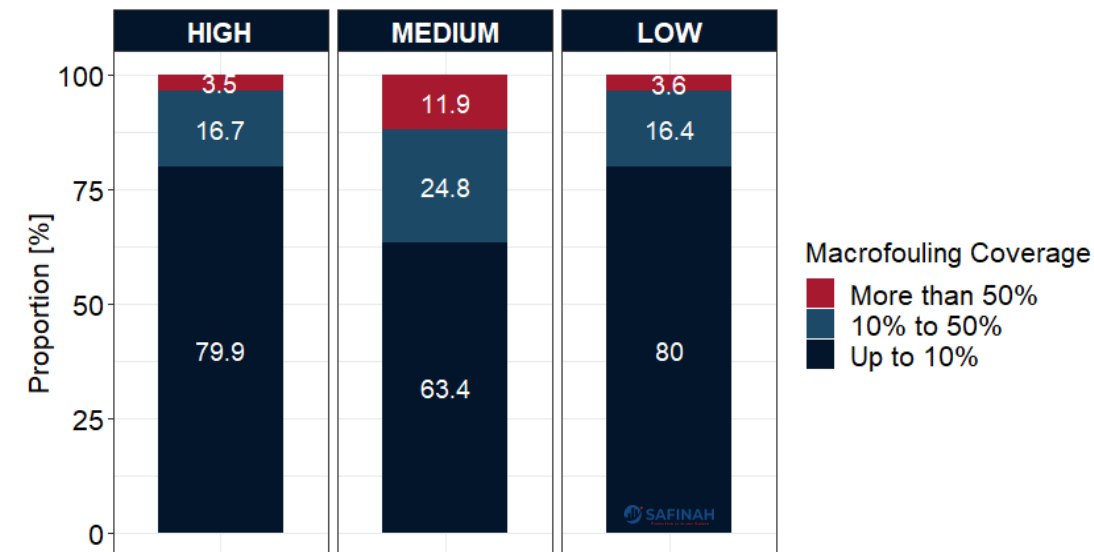
- Do high technology products offer more reliable performance?
- Is product positioning accurate?
- Contributing factors?

- **High/Low - No difference in terms of in-service performance?**
- **Ship-specific approach to specification and selection required.**

Perceived Technology Level - Transitions



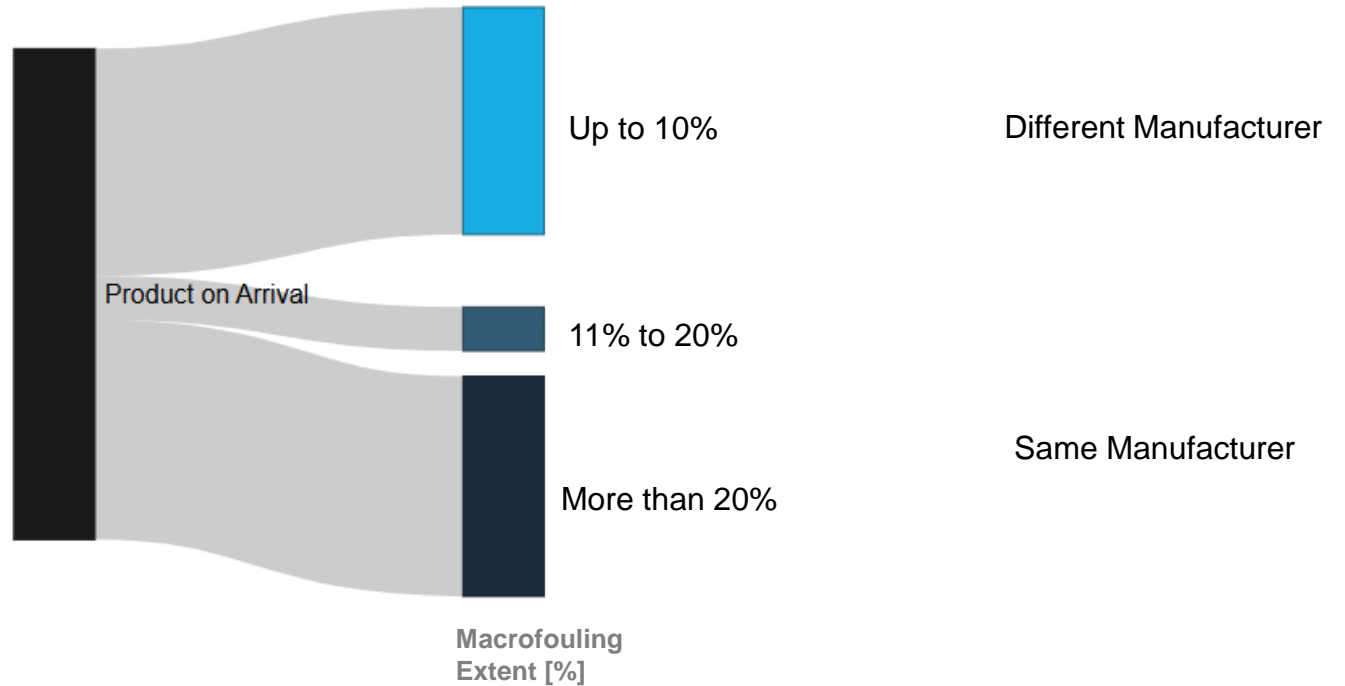
Macrofouling Coverage by Perceived Technology Level



Fouling control coatings

Selection and Performance

Coating Selection Trends



Some highlights:

- On average >1,300m² per vessel covered in hard macrofouling (vertical sides).
- 20% of vessels have less than 100m² of hard macrofouling on arrival in drydock (total area).

More than half of the ships with **>20% macrofouling** on arrival in drydock opted for the **same manufacturer** and often the **same product**.

>> Lack of systematic review of fleet coating performance and effective pre-planning.

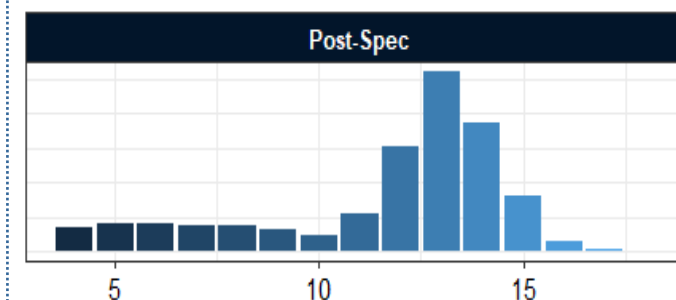
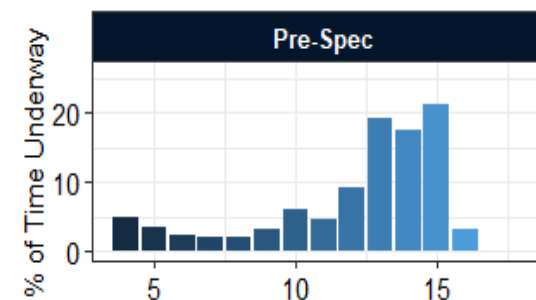
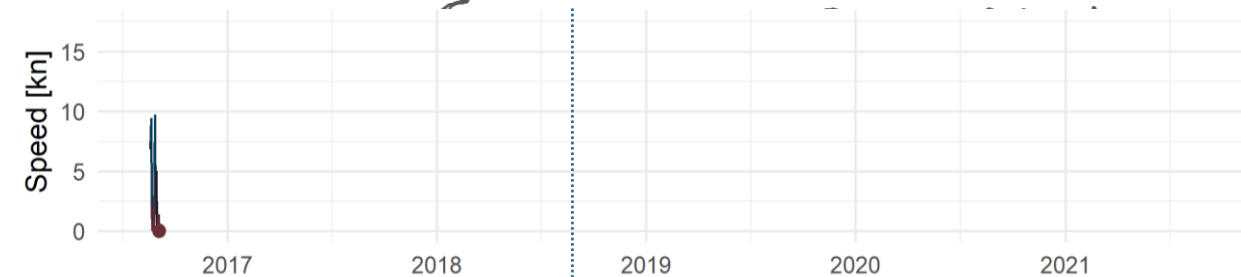
Case Study

- **Highlights**
 - Coating manufacturers consulted during planning stage
 - Premium fouling control product applied

- **Outcome**
 - Poor in-service performance (biosecurity risks, elevated GHG, costs, delay)
 - Severe early polish through (to tie coat)

- **Potential reasons/contributing factors**
 - Inappropriate specification:
 - Environmental / operational parameters not ship-specific (generic parameters used)
 - Around 2020 significant change in trading route
 - In-water cleaning events – at least one known IWC

- **Prevention**
 - Extensive pre-planning prior to dry-docking



Historical or current specification did not match the operational profile of the ship.

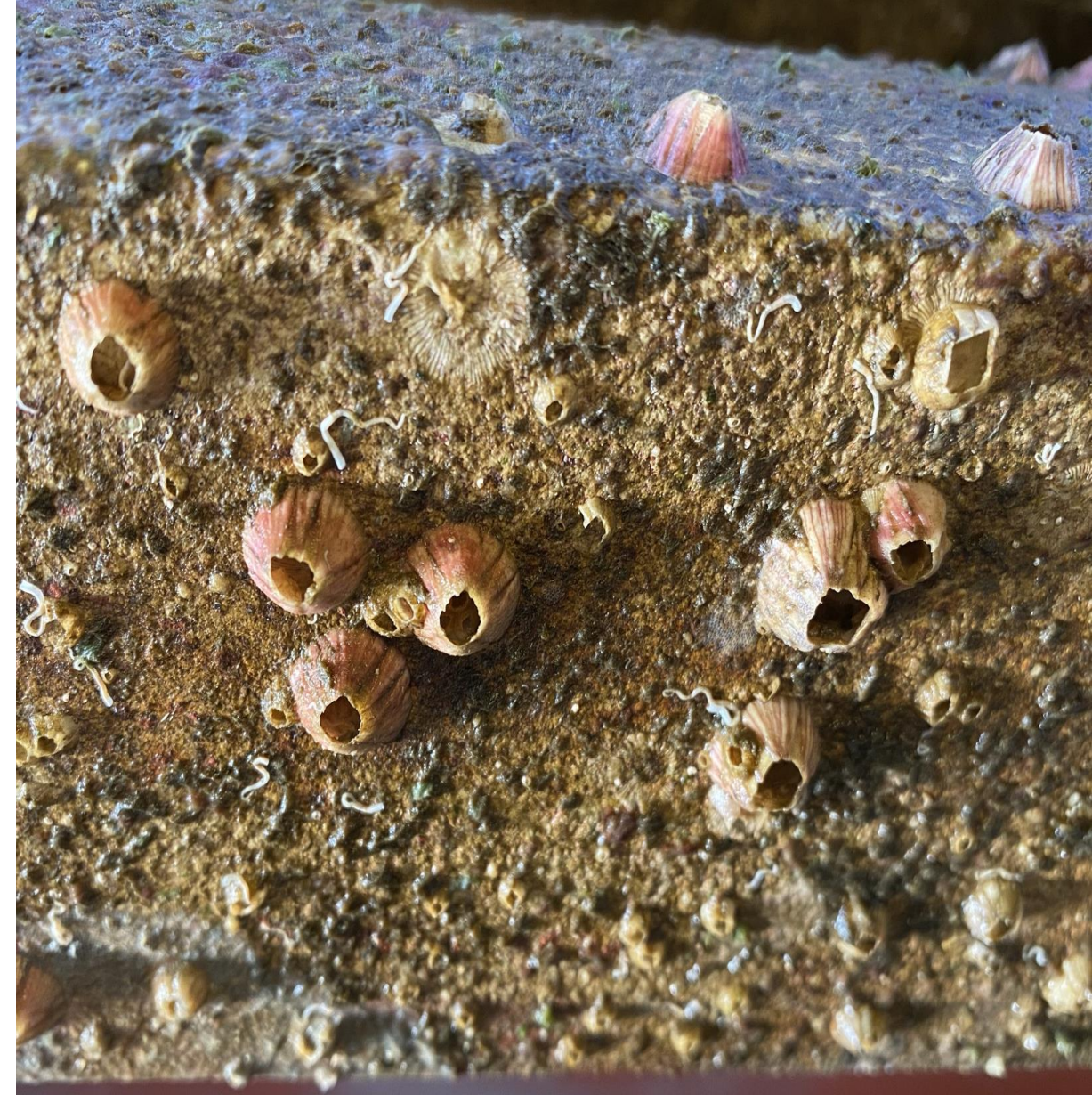
Specification Issues

Root Causes



Examples:

- Incomplete / inaccurate historical vessel data
- Changes to the operating profile not considered
- Errors in tender offers – products, operating profiles, surface preparation, schemes, surface areas
- Budget considerations
- Planned versus actual surface preparation
- Fleet-wide specifications
- Tradition / no diversification
- Lack of structured test patching

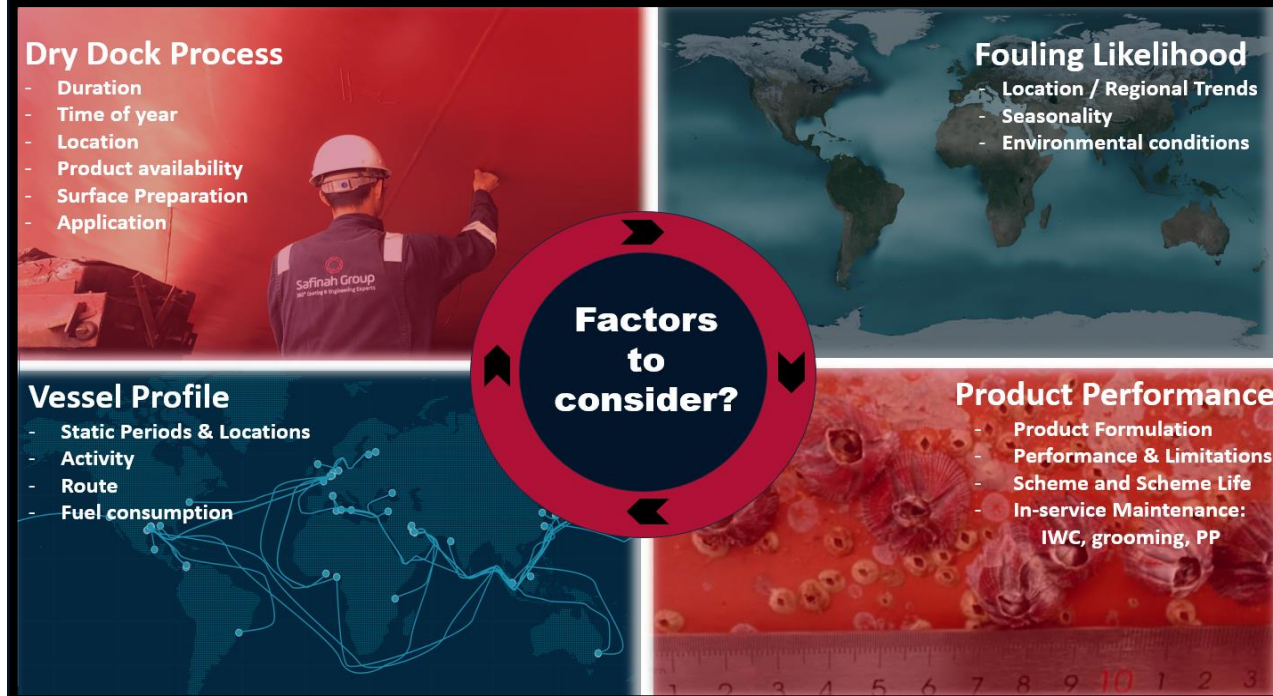
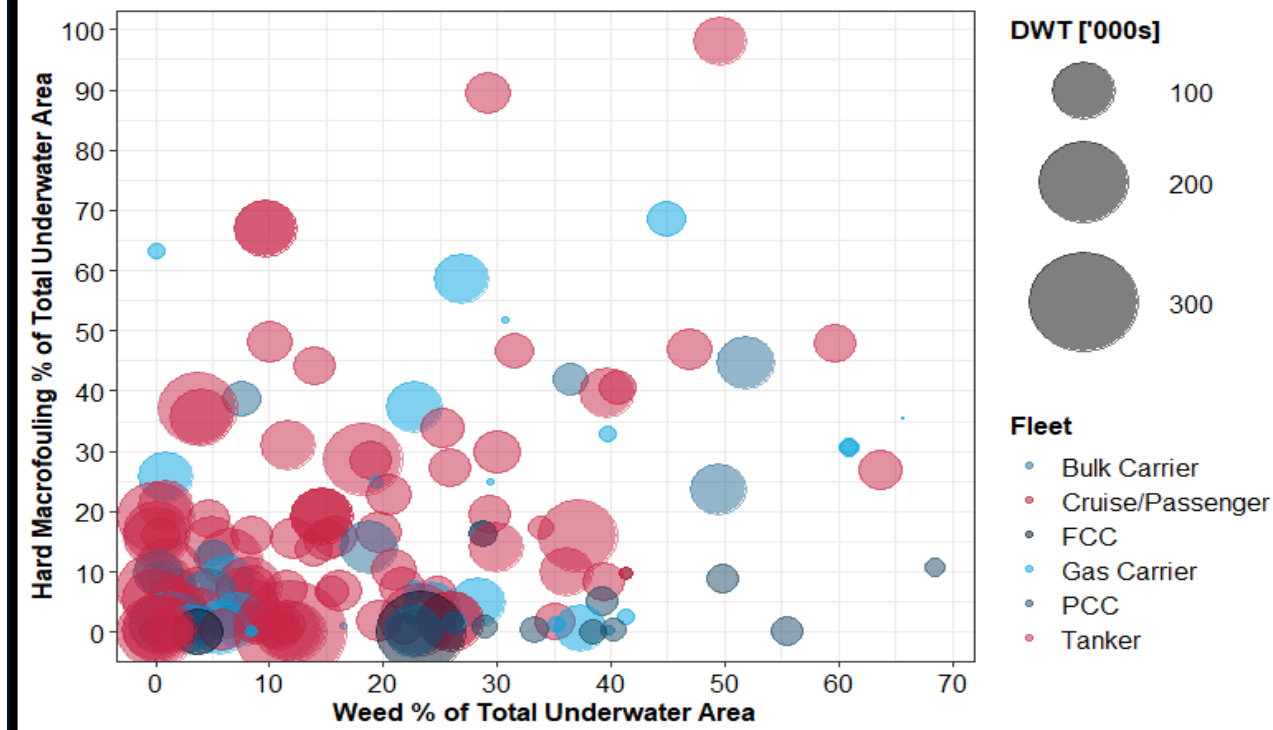


Summary



Tools:

- **Data** on coating performance across ship types, operational profiles, coating technologies, and specific products is critical for optimal product selection
- A **systematic approach to coating selection and specification via**
 - Functional specifications
 - Periodic fleet reviews
- Are **key to robust evidence-based biofouling management strategies**





Safinah Group

360° Coating & Engineering Experts

Carl Barnes

Head of Marine Consultancy

carl.barnes@safinah.com



4 The Staithes, The Watermark,
Gateshead, Tyne & Wear,
NE11 9SN, UK

T: +44 (0)1670 519900

[Safinah Group on LinkedIn](#)

PANELLISTS



Markus Hoffmann

Director, R&D

I-Tech

**Coatings' key role in
shipping decarbonisation**

Sponsored by



Brought to you by





selektope[®]

Marine Coatings Webinar

26 November 2024

Dr. Markus Hoffmann



Impact of Fouling

Barnacle growth on the hull causes friction and increased emissions impacting CII

Scale up of results –
Fouling on a destroyer

Barnacle Coverage (%)	ΔSP (%) at 15 kts	ΔSP (%) at 30 kts
10	36	23
17	44	27
39	54	33
48	57	35
57	54	33
63	55	34
70	53	33
79	52	32
Light**	31	20
Medium**	47	30
Heavy**	76	47

** values from Schultz *et al.* (2011)

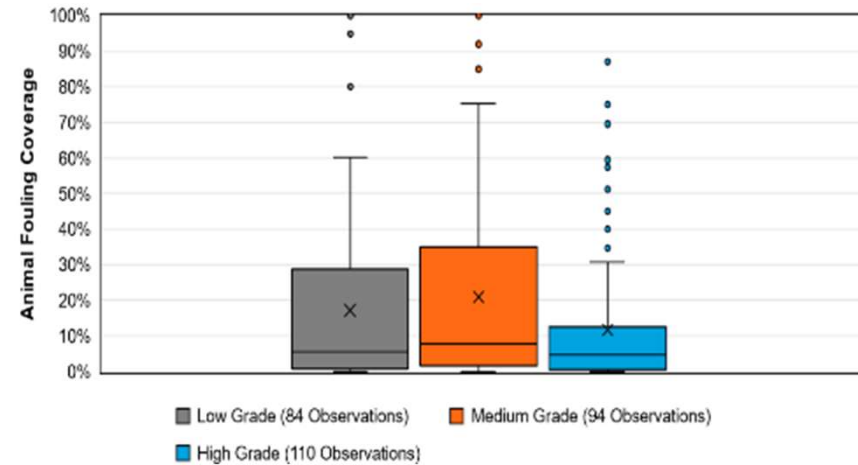
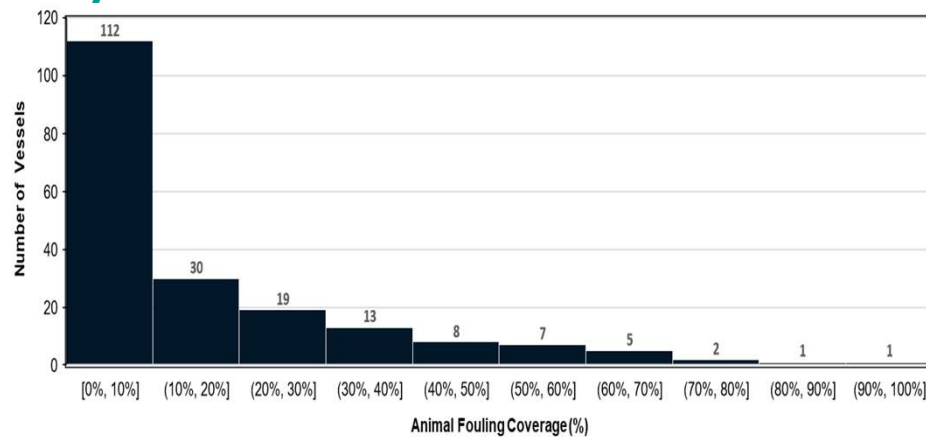
*Changes in shaft power are calculated with respect to a smooth hull surface

As little as 10% barnacle coverage on the hull requires 36% extra shaft power to keep the same speed with an impact on CII



Investing in hull performance pays off

Quantifying the scale of the barnacle fouling problem on the global shipping fleet – Research take aways



Animal fouling condition on underwater hull

Barnacle fouling

- 44% of 249 vessels surveyed had >10% barnacle coverage on the hull.
- Niche areas are exposed to high fouling risk, 74% of observations found barnacle fouling in sea chests.
- Barnacle fouling increases on vessels with lower activity.

High grade VS. Low grade coatings

Investing in antifouling coatings

- Barnacle fouling reduces with coating quality.
- 37% of observed animal fouling was found on vessels with medium range coatings.
- Only 12% of the barnacle fouling was found on hulls coated with high range antifoulings.

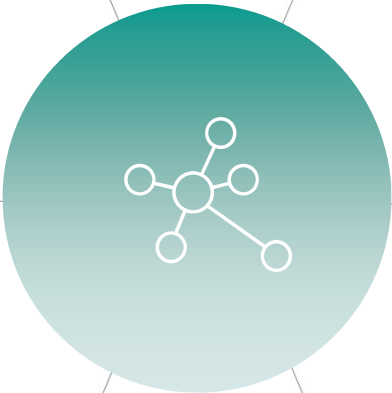
The limited toolbox for Antifouling Coatings

innovation and paint development

<10 available biocides
Regulations has brought 40+ actives down to less than 10.

Few options
Restricted use for some of the available biocides.

Regulations
Limiting innovation.



Biocide-free Options
Facing challenges for high fouling regions, activity and for 5 year docking intervals, FRCs, hard coatings....

Raw materials
Solvents/VOC
Binders/Microplastics
Nanoparticles

Selektope®
Key to future antifouling coatings with the more stringent restrictions on biocidal loadings.

Alternatives/Complementary technologies to Antifouling coatings

Emerging Technologies

Technology	Working mechanism
Ultrasound	Sound waves
Electro Chemical	In situ generated biocides (eg ozone, hypochlorite)
UV Light	Physical deterrent of organisms
Biofouling resistant material	Structured surfaces
Air Lubrication	
Cleaning (proactive & reactive)	Divers or ROW

Summary and outlook

- Hard fouling is still a significant issue for shipping
- A premium Antifouling is needed to obtain a good CII Rating
- Biocides are still key to protect the environment by reducing GHG-emissions as well as mitigate transfer of invasive species that can alter and destroy ecosystems
- Fouling is a complex challenge, there is no golden bullet to eliminate fouling, it is always the combination of different factors to successful protect a hull from biofouling
- Selektope is an essential piece in the toolbox for Antifouling



Tested and approved

- In more than 20 commercial products.
- By 6 of 9 of the biggest paint companies.
- Globally available

PANELLISTS



Nikolaj Malmberg

Head of Business Development, Marine Hempel

Coatings' key role in shipping decarbonisation

Sponsored by



Brought to you by



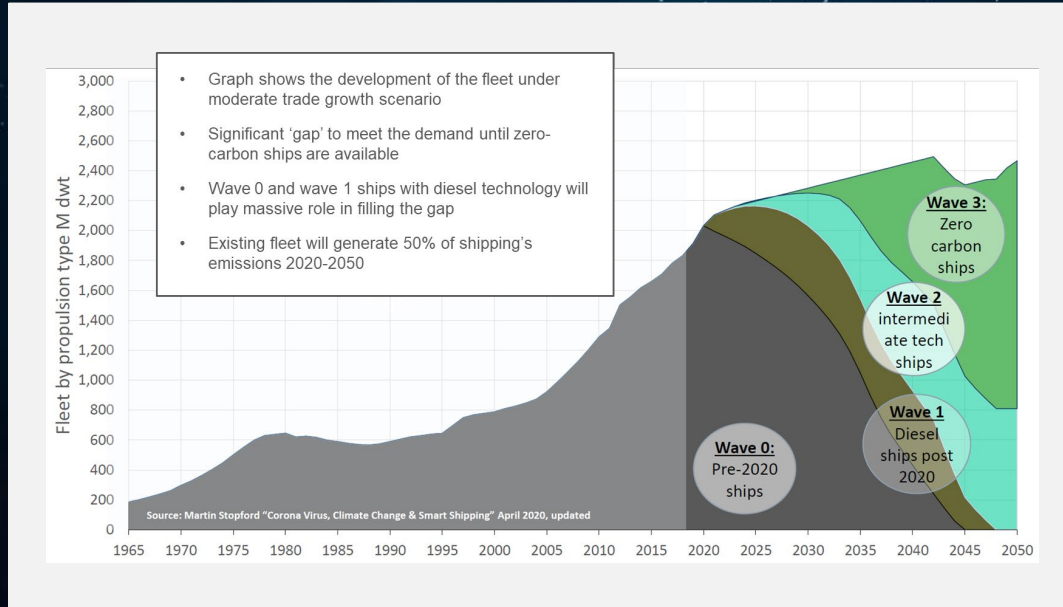


Nikolaj Malmberg

Head of Business Development, Marine
Hempel A/S

We need to use less energy

- now and in the future





Why are hull coatings important to shipping?

40% of your vessel spends most of its life underwater, it is susceptible to wear, deterioration and biofouling.

Biofouling on ship hulls significantly increases both fuel consumption and greenhouse gas emissions.

Considerations when selecting hull coatings



Silicone coatings

The low-hanging fruit of energy efficiency

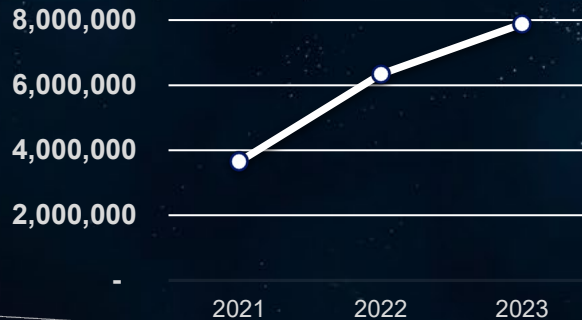
DNV verified
performance



4,500+
applications

6% fuel saving /
CII
improvement vs
top-tier coating
solutions

>100% increase in m2's
coated in 2023 vs 2021



Industry dilemma: How do we balance antifouling coating performance with environmental impact?



Antifouling coating performance

- Reduce fuel consumption
- Prevent the transfer of invasive species



Environmental impact

- VOC emissions in shipyards during application
- Polishing polymers and biocides
- In-water hull cleaning waste material

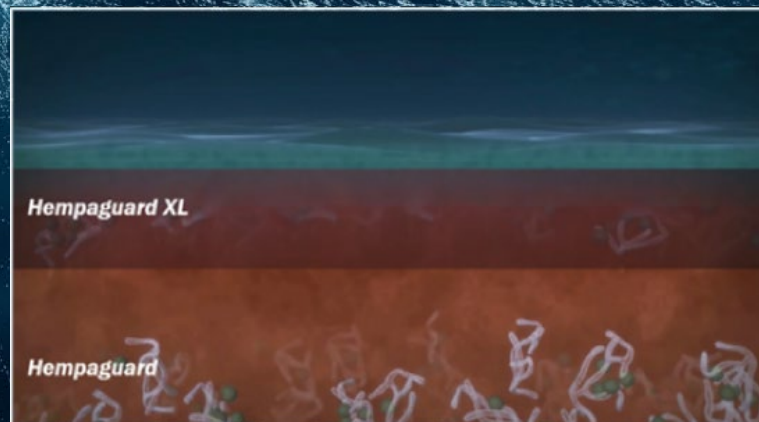
Synergy in layers providing superiority in performance!

2

Hempaguard XL is designed to maintain the smoothness

1

Hempaguard is optimised as reservoir for hydrogel and biocide



UPCOMING EVENTS

**MARITIME
DECARBONIZATION
CONFERENCE AMERICAS**



marine propulsion

WEBINAR

**Driving Operational
Excellence in Maritime:
Challenges and Innovations**

riviera))) In association with ORCA AI deepsea

**OFFSHORE SUPPORT
JOURNAL CONFERENCE
MIDDLE EAST**



osj offshore support journal

**Maritime Regulations
Webinar Week**

riviera)))

**OFFSHORE SUPPORT
JOURNAL SUBSEA
CONFERENCE**



osj offshore support journal

**OFFSHORE
WIND JOURNAL
CONFERENCE**



Offshore Wind

**ANNUAL OFFSHORE
SUPPORT JOURNAL
CONFERENCE | AWARDS | EXHIBITION**



osj offshore support journal

**INTERNATIONAL CHEMICAL
& PRODUCT TANKER
CONFERENCE**



TANKER

SCAN HERE TO SEE THE FULL EVENTS SCHEDULE



The holidays are coming... The holidays are coming!

Order YOUR copy today! 🛒

