Understanding the product performance of Fouling Control Coatings

Biofouling is the unwanted accumulation of organisms, like seaweed and barnacles, on immersed surfaces, such as ship's hulls. Biofouling is proven to slow down a vessel by as much as 40%. Controlling the growth of organisms and maintaining a smooth, clean hull minimizes drag and helps to deliver on the intended operational performance of a vessels. Without effective control, the industry would potentially have to spend an extra $35 billion* per year on fuel and the environment would have to absorb another 400 million tons of CO2 emissions. There are numerous ways to mitigate biofouling, but the use of an appropriate fouling control coating is considered an industry standard.

There are many products and technologies to choose from, as well as a variety of factors that influence performance such as vessel trading route and vessel activity (speed and operation) – these are important considerations in selecting the right fouling control coating.

At AkzoNobel, we have been collecting data on the in-service performance of our coatings for >40 years and we use this information to provide advice to our customers. However, synthesising such a complex dataset into actionable outcomes is not easy.

Objectives:

- Analysis of the product performance dataset using the performance metric to understand the performance of each product aggregated by route and separated by vessel activity profile
    - Quantitative analysis for understanding absolute performance
    - Qualitative assessment or relative ranking of products against one another
- Use statistical interpolation to gap-fill the dataset where there is limited data to enable us to have confidence in the performance (qualitative, quantitative and ranked) of the products
    - Interpolation by vessel route (gap filling based on similar routes)
    - Interpolation by product type (gap filling based on products with similar technologies)
- Any additional interesting approaches to analysis from the dataset

Understanding the dataset

- Unique Identifier = UID for internal use
- Vessel Group = information on the vessel type that the product was applied
- Scheme = how long (in months) the scheme was specified to last on a vessel
- Scheme Group = how long (in months) the scheme was specified to last on a vessel grouped to 0-36, 37-60
- In Serv= time (in months) the vessel was in operation before assessing the performance
- UW Cleaned = Yes or No indicating whether the vessel has been cleaned or not
- Route Number.1 = Identifies the route a vessel has operated on (1-9)
- % Activity = how active a vessel has been as a percentage of the in-service time
- Activity Group = how active a vessel has been, grouped to 0-30, 31- 60, 61-100
- PerformanceMetric = a performance metric 0-100 scale, 0 = best, 100 = worst
- Pass = binary, 1 = pass, 0 = fail

- FoulingType1 = % of a fouling type
- FoulingType2 = % of a fouling type
- FoulingType3 = % of a fouling type
- productref = Unique reference number for each unique product (1-20)

*IMO GHG Study