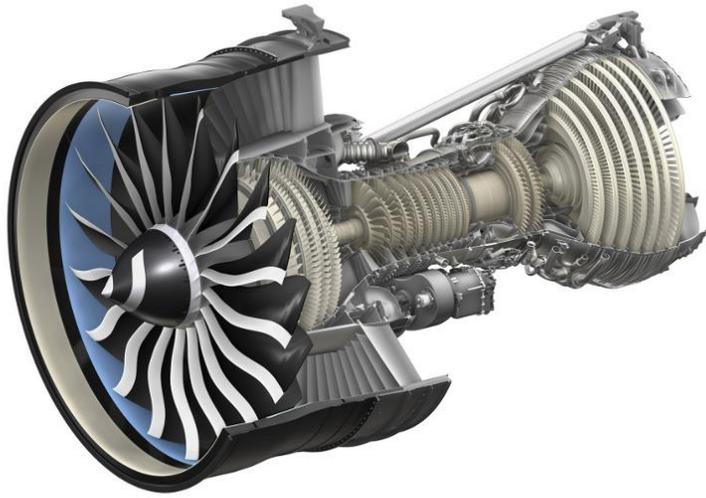




Philip Chaabane, CEO I-Tech AB

Biofouling: The next big environmental battle
An Uncertain Future Conference, London. February 14, 2019

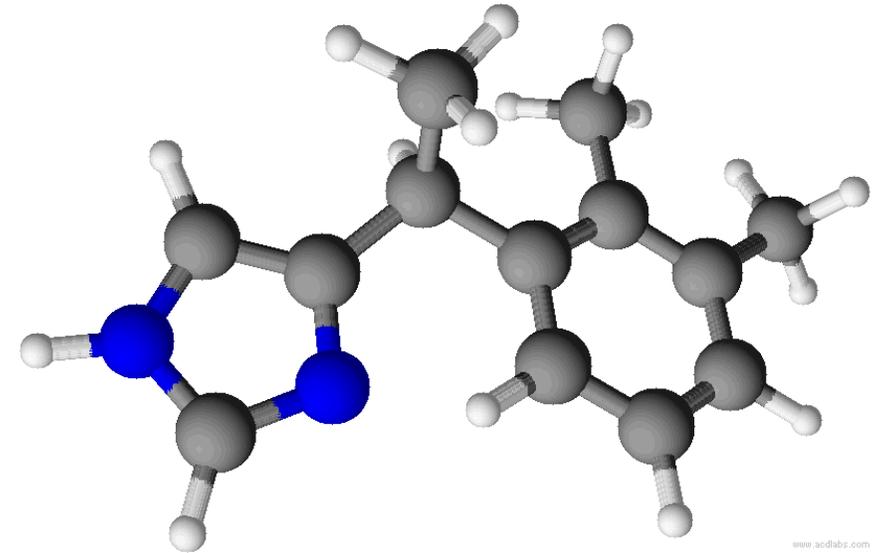
Why me? Isn't there someone with a better haircut?



New jet-engines with 20% improved fuel savings. Modular design for higher engine serviceability. Power by the hour concepts



Fuelcell systems and batteries brings new competition based on new technology (Tesla and Nikola etc)



Selektope® can lower biocidal loadings by up to 90% still contributing to improving hull performance

Bridging tech-experience from other fields into the marine industry

Biofouling – obvious need for improvement

Why are we still having this debate, even though the problem has been around for 2500 years?

Biological impact

- Hull biofouling identified as key IAS vector. Risk: 1700 species, comprising over 4,000 organisms.
- Known port refusals of fouled ships hints that regulation will kick-in on local levels.

Economic impact

- Acknowledged fuel saving potential of 10% by using optimized AF coatings across the global fleet.
- Adoption of optimized AF coatings would save approx. 35 million tonnes of fuel to a value of 14 billion USD (assuming 400USD/ton bunker fuel cost and 350bn tonnes per year use).

Environmental impact

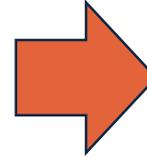
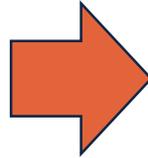
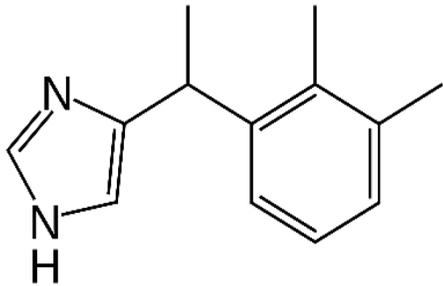
- >100 million tonnes of CO2 emissions saving
- 40+ active substances reduced to <10 due to shift to pharma-grade regulatory system that approved only those with a much better environmental profile, including Selektope.



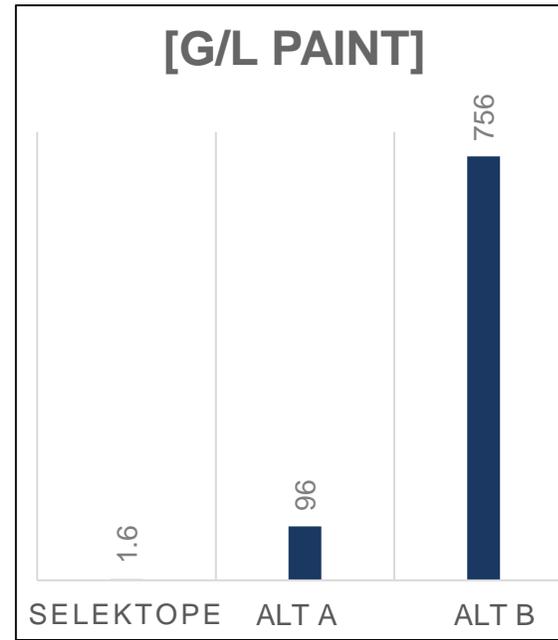
<u>Fouling Type</u>	<u>Increase in Resistance</u>	<u>Source</u>
Slime	5%	Conn <i>et al.</i> (1953)
	8 – 14%	Watanabe <i>et al.</i> (1969)
	18%	Lewkowisz & Das (1986)
	10 – 20%	Loeb <i>et al.</i> (1984)
	25%	Lewthwaite <i>et al.</i> (1985)
	8 – 18%	Bohlander (1991)
Shell & Weed	85% (extreme case)	Kempf (1937)

Think outside of the bucket, but still make sure you're in it

selektope®



Source: Chugoku Marine Paints



Considerations for the panel debate

- Why isn't the willingness to take risk for adopting state-of-the-art antifouling coatings and technologies higher when an upside of saving 10-15 billion USD worth of fuel is on offer?
- How can we come to a point where each coating decision for every ship is considered to be an investment rather than a cost?
- With the wide range of complex technologies and services available, how should business models change to take full advantage of those and give the hull the same "attention" as the tiers of a race car?





i-tech