Antifouling paints, biocides and marine pollution

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Antifoulings paints : brief presentation

- Used to coat the bottoms of ships to prevent sealife such as algae and molluscs attaching themselves to the hull
  - Algea and molluscs can slow down the ship and inscrease the fuel consumption (20%)

- The most efficient substances to prevent fouling are the biocides
  - Action of biocides : slowly "leach" into the sea water, killing barnacles and other marine life that have attached to the ship

- The impact on the environment can be important so some regulations exist :
  - IMO International Convention on the Control of Harmful Anti-fouling Systems on Ships
  - EU regulation on the use of biocidal products (11 biocides autorised in antifouling paints)

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Biocides issues

- Negative impacts on the marine environment :
  - abnormalities
  - Imposex
  - Mortality

- Negative impacts on human health :
  - Toxic
  - Carcinogenic

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Biocides issues

- We try to tackle two environmental issues :
  - Marine pollution due to biocides leaching
  - Pollution due to bad practices :
    - Refit in inappropriate areas (beaches…)
    - Use of inappropriate or illegal products (TBT, pesticdes with paints...)

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French action

- Programme of Measures of the Marine Strategy Framework Directive (metropolitan France):
  - Identify careening areas in marinas with biocides treatment system

- Broader action : find alternatives to antifouling paints with biocides
  - 2 reasons :
    - Biocide treatment systems : expensive
    - Prevent biocide leaching to the marine environment

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Alternatives to antifouling paints with biocides

- 25 alternatives found in a report (not all environmental friendly)

- What we need regional/bilateral cooperation to :
  - Identify best environmental pratices (refit, paints…)
  - Identify the biocidal products authorised in the Caribbean region in order to have a common approach on this subject

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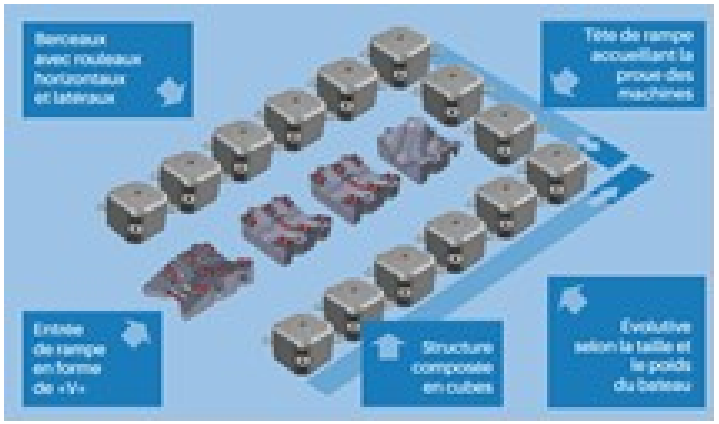
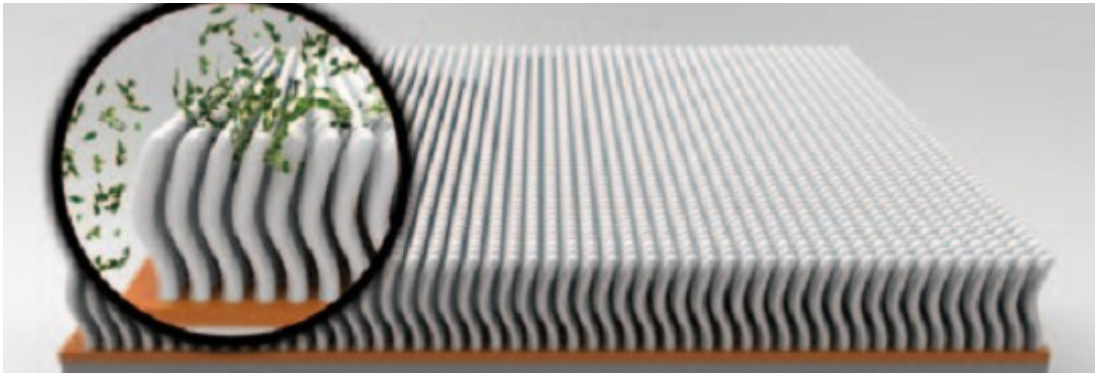
Potential recommandations

Floating boat docks



Self-adhesive film of microfibres.



floating hydraulic boat lift

boat lift

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Recommandations.

Boat bag

wash station

Wax

Alternatives to antifouling paints with biocides

Antifouling action based on physical principal Ultrasonic vibration techniques. Protective bag for the hull. UV light-emitting diodes in a protective coating.* Electrolysis of sea water.* The direct transfer of electrons between an electrode and the microbial cells.*	**Preventative methods** Robot cleaning equipment. Dockside hull wash station. Portable boat wash station. Steam cleaner. Cryogenic cleaner. Dry docks (boat lift, floating hydraulic boat lift, boat docks, dry port) Short-stay in freshwater
Biocide-free coatings Ultra-smooth coatings. Silicone antifouling adhesive film. Bio-repellent (medetomidine). Hydro viscose coating. Self-adhesive film of spikey microfibres. Wax. Nanorepellent coatings.* Hybrid coatings.*	**In the future :** - Biomimicry. - Antifouling enzymes and polymer film * under development

FIN

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