

Antifouling Types, Leaching Rates and In-Water cleaning

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Antifouling Types

- There are three main antifouling technologies used on Yachts:
 - SPC (Self-Polishing Copolymer)
 - Ablative (Eroding, Self-Polishing, Soft)
 - Hard
- These work by slowly releasing biocides (most are based on Copper) from the coating surface.
- They differ in the mechanism of biocide release.

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Antifouling Biocide Release Mechanisms

- Sea water is alkaline (pH ~ 8.2) and antifouling works by having an **acid binder** component that can dissolve in sea water to release the biocides.



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Antifouling Biocide Release Mechanisms

- There are two main "soluble acids" used to enable biocide release in sea water:
 1. **Rosin** – Obtained from trees (~ 90% Abietic Acid)
 - High Rosin content => **Ablative / Soft**
 - Low Rosin content => **Hard**
 2. **SPC (Self-Polishing Copolymer) Acrylics** - Synthetic

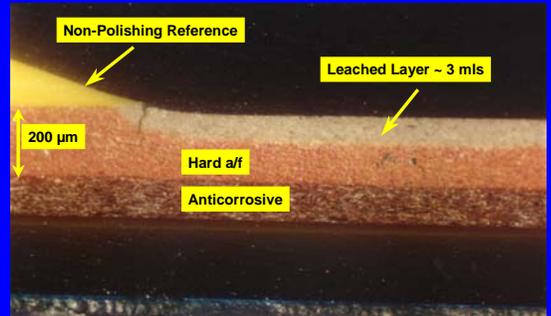
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Antifouling Biocide Release

- The release of biocides is controlled by the **type** and **amount** of the acid resin, and not by the quantity of biocide in the paint.
- The acid resin controls the thickness of the **Leached Layer** on the surface of the antifouling.
- SPC and Ablative antifoulings exhibit a thinner leached layer than do the Hard antifoulings.
- A thin leached layer gives a more efficient release of Biocides than does a thick leached layer.

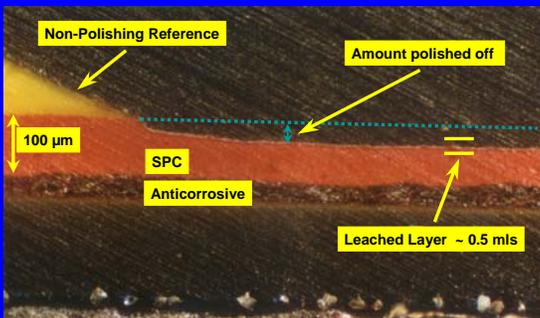
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Typical Hard Antifouling Leached Layer



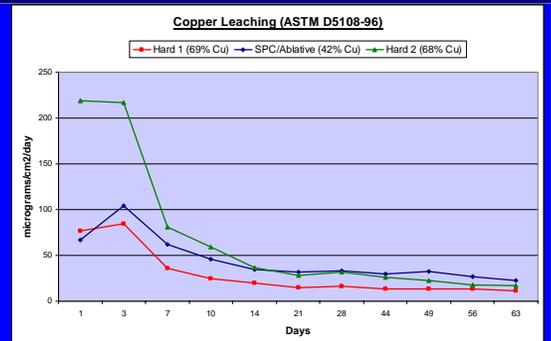
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Typical SPC/Ablative Antifouling Leached Layer



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Antifouling Biocide Release



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Antifouling Biocide Release Mechanisms

- High Copper content does not always mean high performance.
- Ablative paints generally show better performance compared to Hard paints, and so do not need to be in-water cleaned.
- In-water cleaning removes the leached layer and leads to increased copper release.
- In-water cleaning is not needed if the correct antifouling is used.

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Copper Antifouling Regulatory Status

- USEPA Re-registration
- EU Biocide Products Directive
- EPA-U.S. Navy UNDS Decision
- EU Countries - Status

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THANK YOU

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