

THINK ZINC!



Between 2015 -18 the River Hamble Harbour Authority contributed to funding PhD student Aldous Rees from Southampton Solent University investigating the localised variation in corrosion of sacrificial anodes. Below are extracts from his work.

Findings:

- Some boat owners use the wrong anode type. **Zinc** is designed for seawater. **Aluminium** is for brackish & seawater. Magnesium is for use in fresh water only.
- Some boats have **more anodes than necessary**. This increases cost and adds to the already relatively high levels of dissolved zinc in the Hamble.
- Anode corrosion will be quicker on boats moored in areas of **higher salinities** i.e. 50-60% wear p.a. is typical from Hamble entrance to around Mercury bend. Less wear is expected to zinc anodes around Bursledon due to the lower salinity.
- **Sacrificial anodes** do not corrode quicker in the Hamble than in other estuaries. Salinity and stray currents do cause localised variation in anode decay, and this is seen beyond the Hamble.
 - The **variation in pH** observed in the Hamble is not sufficient to cause varied anode corrosion.
- **Anodes are the biggest contributor of zinc** in the Hamble. 6.95 tonnes/year is released from c3,000 vessels. The highest zinc concentrations occur around Bursledon in areas of higher boat density.

Hints and tips:

- **Replace annually**. Sacrificial anodes are designed to last 1 year with normal wear being 40-60%. The proportion of zinc in anodes may vary so choose your brand carefully.
 - For anodes to protect the cathode they have to **be in physical contact or connected via a wire**.
- Switching to **aluminium anodes** may be of benefit, especially if moored in the mid to upper reaches. They may last 1.5 years instead of zinc's 1 year, and will help to reduce zinc levels in the water.
- **Stray currents due to 'common earth'** wire in marina power supplies may accelerate corrosion. Fit a galvanic isolator to break current flow or unplug when not aboard your vessel.
- **Salinity and stray currents** should not cause complete anode corrosion over the course of a year. If so, seek advice from a marine engineer as there may be an issue with the vessel e.g. wiring.
- If you continue to experience any anode issues **contact an anode supplier for advice** on the type and size of anodes suitable for your vessel.
- **Appropriate use of anodes will help reduce zinc concentrations** in the estuary which are currently very close to the limit allowed under Environment Quality Standards.

