



Degradation of a zinc anode shows it's working to protect other metals on a boat



This shaft anode has been doing its job

# Time for a rethink on zinc?

So common is the use of zinc in anodes that Americans simply call them 'zincs'. But that could be about to change, Rob Melotti reports

**T**he rising price of zinc has led anode manufacturers and corrosion experts to advise coastal and offshore boat owners to fit aluminium anodes instead.

MGDuff, the market leader in supplying anodes to the UK and Europe, has announced that due to commodity prices, aluminium anodes are now 20% cheaper than the zinc alternatives.

A spokesperson for the Italian firm Tecnoseal agreed with the assessment as does Nigel Calder, author of *Boatowner's Mechanical and Electrical Guide*. "Given the opportunity I advise people to switch to aluminium," he said.

"Aluminium anodes have been on the market for the last 30 years or more, but since the price of zinc has doubled in the last two years, aluminium is now cheaper," says MG Duff commercial director James Beale. "And it's the better anode material: it has a higher driving voltage so, unlike zinc, it works in salt water and brackish – and has a higher amp-hour per kg rate meaning it lasts longer too. Another plus is that aluminium anodes are more environmentally friendly as, unlike zincs, they don't contain cadmium."

## Wider usage

Princess Yachts has been using aluminium for a number of years, but according to Beale, Sunseeker switched to aluminium recently as well.

The three most common anode materials are zinc, aluminium and magnesium. For fresh water, which is the least conductive medium, the most reactive metal, magnesium, is required. Aluminium is the next most reactive and was always specified for brackish water and often for commercial applications in salt water. Zinc was always the cheapest material and effective enough for sea water, however recent price increases have changed the equation.



Aluminium anodes are likely to be more widely used

"For the vast majority of our zinc anodes we make an aluminium equivalent," says MGDuff sales director Toby Biddlecombe. "The only reason people have been using zinc in the past is the price. In the commercial world we've been using aluminium in sea water for over 30 years. We've spent a lot of time talking to distributors explaining the aluminium option and it is slowly feeding down to the chandleries. The latest catalogue will include plenty of additional aluminium models, especially in the shaft anode ranges where there hasn't previously been the demand. There will be a portion of the market that sticks with zinc and a portion that is open to change and

understands why we are offering aluminium now. For mail-order chandleries, shipping aluminium is much cheaper than zinc because it's so much lighter."

## WOODEN-BOAT WARNING

Take extra care mounting anodes to wooden hulls as the electro-chemical reaction can damage the boards. Wherever possible mount anodes directly on the metal item that needs protecting, although hanging anodes are also a possible solution.

## WHAT IS CATHODIC PROTECTION?

Water conducts electrical current, which enables different metals in close proximity to create a circuit.

On a typical leisure vessel the area under the stern features a prop shaft, a propeller, a rudder post and perhaps metal through-hull components all within a small area and linked electrically through the medium of sea water. It's the equivalent to a low-power battery, which would be unremarkable apart from the fact that the electric charge gradually and almost imperceptibly corrodes the various terminals – ie your boat's expensive metal fittings.

The solution lies in applied chemistry: install a sacrificial chunk of the correct metal (an anode) wired to the vulnerable metallic items and the circuit will corrode the anode, leaving the more valuable bronze and stainless steel items unaffected.

I asked whether aluminium anodes in high salinity conditions could actually over-protect the metal components under the water. Both representatives of MGDuff were adamant that it could not happen and Nigel Calder agreed: "I haven't heard of that being an issue. The voltage is almost identical to zinc. If you get over-protection on a fibreglass boat all it'll do is lift a little bit of the paint off the cathode, so it's not going to do any physical damage."

"The key thing is you can't mix zinc and aluminium in the same system... although you can have zincs in the engine (in the water-cooling system for example) and aluminium on the hull because from a corrosion perspective it's two different bodies of water."