

## Sacrifice Is the Best Defense

Sacrificial zinc anodes are the critical frontline in protecting metal running gear and engines from costly damage due to galvanic corrosion. They are not cheap, but compared to the cost of the damage they prevent, they're a bargain. Even the best anodes will not provide full protection if they're not installed correctly and replaced in a timely fashion. Anodes require solid contact with their host device in order to work effectively. The mounting surface of the device and the corresponding back surface of the anode must be as clean and free of corrosion as possible. The use of medium-grit emery cloth on an orbital palm sander is a very efficient way to remove corrosion from flat surfaces such as hulls and rudders. The exposed surface of the anode should be free of substances that might insulate it from contact with metal or water.

Most manufacturers recommend that anodes be replaced when they appear to have lost half their mass, but there are other considerations. Even an anode that appears to have retained most of its original size and shape may have developed an insulating layer of corrosion between it and its host surface, which reduces its effectiveness. It may be possible to get more life out of it by cleaning the mating surfaces, but replacement is a more reliable option.

Properly sized anodes should provide protection for a full season under most conditions. An anode that has disappeared completely during a six-month period was probably too small to offer the needed protection in that situation. It should be replaced with a larger one or supplemented with additional smaller units mounted to the same piece of gear. At the other end of the spectrum, an anode that looks like new after six months in the water may be lacking a good electrical connection, in which case it provided no protection at all.

Most marine engines are equipped with internal anodes to protect their cooling systems from damage. The condition of these anodes, which are often part of a plug or in the shape of a rod, is more critical than exterior anodes because flakes or chunks of a deteriorating anode can be carried through the system and clog critical components such as heat exchangers. Internal anodes should be inspected more often than external ones.

Replacing the anodes on propeller shafts of inboard engines requires some special consideration. The shaft should be thoroughly cleaned before installing the anodes; a narrow strip of emery cloth drawn back and forth around the shaft does a good job. Proper placement of the anode on the shaft is also important to avoid future problems. There must be enough room between the anode and the cutlass bearing, whether it's in a strut or a keel, to allow water to flow into and lubricate the bearing.