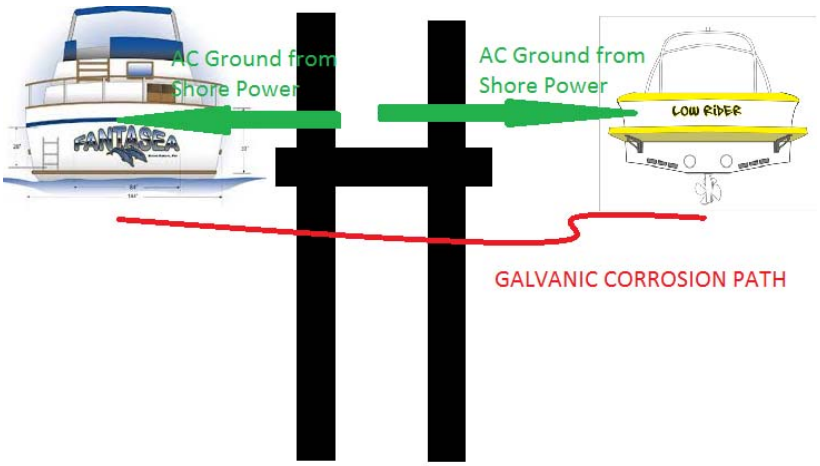
SITKA HARBORS & *GALVANIC CORROSION*



You Need a Galvanic Isolator -

Even though you are "persistent" and annually replace your zinc anodes you may find that they disintegrate too quickly or that you have other significant corrosion occurring. If this is occurring then you likely need to install a **GALVANIC ISOLATOR** in your boat. These galvanic isolators are installed in SERIES with your green ground wire on the 120 VAC connection to the dock power where they limit the amount of stray current flow.

Some Manufacturers are: Pro Mariner 30 amp pro-safe fail-safe, Guest 30 Amp Fail Safe Galvanic Isolator

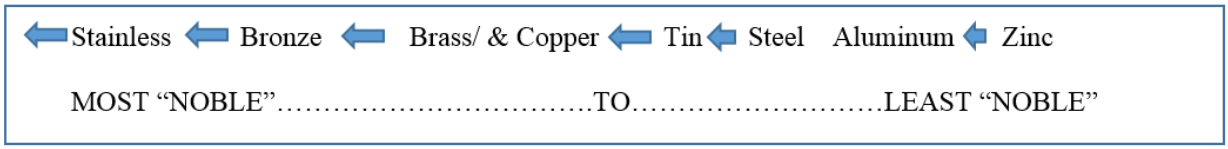
Note: Larger boats and aluminum boats are often protected with an isolation transformer. These are much more expensive.

THE PROBLEM:

A boat owner in a slip CONNECTED TO SHORE POWER needs to know that an aluminum outdrive on one boat and the bronze propellers on the next boat (dissimilar metals below the waterline) in saltwater (an electrolyte) creates a direct current like a DC battery (which creates migrating electrons) and this is the ROOT of galvanic corrosion. Saltwater is a WAY more effective electrolyte than freshwater. Even if you have zincs on your boat, the more dissimilar the metals are between you and your neighbor's boat, the more likely galvanic corrosion will occur (and if you have the less "noble" metals on your boat, then you are likely to see more problems than you neighbor who doesn't, see below).

It gets even worse when two or more boats are connected to SHORE POWER. To get galvanic corrosion REALLY going you need to complete the two sides of the circuit. One side of the circuit is provided by the AC **green grounding** wire from the shore power which is effectively **SHARED** with your neighbor's boat (and all the boats PLUGGED in within the harbor). That green AC ground wire on your boat is normally connected to your boat grounding system which includes your engine and likely all of your underwater hardware. **The other side of the circuit** is the seawater between your neighbors bronze propeller and your aluminum outdrive. Galvanic

current WILL FLOW and WILL CORRODE the least noble metal between the two (aluminum or ZINC or IRON, see the chart below).



An imbalance of metals among the boats is the cause of galvanic corrosion dissolving the least noble metal (the circuit path likely completed by both the ground wire on your shore power and the saltwater between your boat and your neighbors). Equipment on your neighbor's boat that is not protected will be protected by the anodes of OTHER boats…like yours! When this happens, you will find your anodes (or parts of your boat) dissolving quicker.

Few of us want to lose the benefit of shore power. However you can fix it by "interrupting" the circuit by cutting the green grounding wire on your boat but you CAN NOT DO THIS BECAUSE YOUR AC SYSTEM WILL NO LONGER BE GROUNDED and anyone in the water near your boat runs the **risk of being electrocuted by stray AC current**.

SOLUTIONS:

YOU MAY NEED MORE THAN JUST ZINCs

A great way to reliably interrupt the galvanic corrosion circuit is to **install a galvanic isolator in SERIES on your AC Shore Power Green Ground Wire**. These Galvanic isolators limit galvanic current flow (up to the value of the diode inside the galvanic isolator "box" which can be 0.6 to 1.2 volts) between your boat and your neighbors boat while allowing dangerous AC current to safely pass through to the ground on shore. If you purchase and install a galvanic isolator on your boat it needs to be rated AT OR ABOVE the circuit breaker feeding your boat. In our harbors, the most common is a 30 amp circuit however 50 amp, 60 amp, 70 amp and larger are available. The nicest ones include a **MONITOR because if the galvanic isolator fails, it could mean that your AC ground has failed and you have a serious safety issue for yourself and others.** We would recommend a "fail-safe" galvanic isolator with a monitor for that reason (see the pic, we don't recommend any particular manufacturer or supplier this is just an example).

In Summary,

These are only the most common sources of galvanic corrosion. Others do exist. Be Safe…make sure your Green AC ground works!

Thanks

Sitka Electric Department