

The Art of Recreating Long Term Marine Exposure

A favorite sundown topic among owners of old boats could be loosely called “bilge discoveries,” the graphic, and often poetic musings on the tools and prized possessions that have disappeared into the bilge, and the mutant life forms they’ve encountered deep in the bowels of their boat.

Re-creating one of the planet’s harshest environments for this test’s torture chamber deserved careful thought. Go too far, and our corrosion test would have no validity. Not far enough, and any results would require the patience of Job. Ultimately, the chosen environment for the tests was an enclosed chamber held at 105 degrees with a layer of sea water in the bottom. The sea water was condensed to have two times the salinity of ordinary sea water (70,000 ppm NaCl as tested). The exposure cycle is as follows:

- Turn heat off. Allow to cool to 70 degrees.
- Gently wet (watering can) with salt water, uncover, and allow samples to dry for 60-84 hours.
- Close chamber and heat to 105 degrees for 12 hours. Because the samples are cooler, condensation will occur.

- Repeat two times each week.

This regimen mimics procedures employed during accelerated corrosion testing of automobile parts and is generally held to compress two years of use into two weeks of testing, depending on the precise variables.

Because the bilge of the boat is already an abusive environment, we believe this testing method will only compress the timeframe perhaps 20 times instead of the 52 times projected for automotive parts. We do know that the wires look as bad as any we have seen in a wet bilge after 20 years of exposure; we credit the high salinity imparted by the drying cycle for most of the acceleration.

Corrosion in a dry cabin environment, of course, is not necessarily much different than corrosion in a humid home or an automobile; the acceleration factor is extreme for this case, and the changes we would see in our environmental chamber within a few weeks will not occur in 100 years. Comparisons and parallels will depend very much upon the individual boat and the location in question.