



The test setup with the LED lights on the left and the incandescents on the right.

LED Lowdown

Changing to LED could save you money.

Mark Corke explains the differences between LED and incandescent lights

LEDs—light-emitting diodes—work completely differently than standard bulbs. In a standard light bulb, a filament of very fine wire burns in an inert gas, which prevents the bulb from burning out and glows white-hot. Most of the energy created is given off as heat; only 10 percent or less is converted into visible light.

LED clusters are not bulbs in the usual sense, but instead consist of a layer of electron-rich material separated from a layer of electron-deficient material sitting on a semiconductor base. When power is applied, the electrons become excited and emit light photons. No filament is being burned, little heat is given off, and far less electricity is used for the same light output.

When your boat is at anchor, you rely on battery power or the energy produced by the engine or generator. Profligate use of lights could leave you with a dead battery. It goes without saying that reducing the amount of

power you use is beneficial.

To illustrate the difference in power consumption between LED and incandescent bulbs, I built a test setup to simulate the power requirements of two similarly equipped boats, one using LED lights and the other incandescent. I connected each of them through a switch panel equipped with an accurate digital ammeter. Each “boat” had a port and a starboard light, a stern light, a masthead light, and a reading lamp. I used an accurate light meter to check each

LED

PROS

- 50,000 hours-plus useful life
- Little heat produced
- Low power consumption

CONS

- More expensive than traditional bulbs
- Light quality can be unsuitable for interior applications

INCANDESCENT

PROS

- Inexpensive
- Problems can be easier to find
- Replacement bulbs readily available

CONS

- Lots of heat produced
- High power consumption



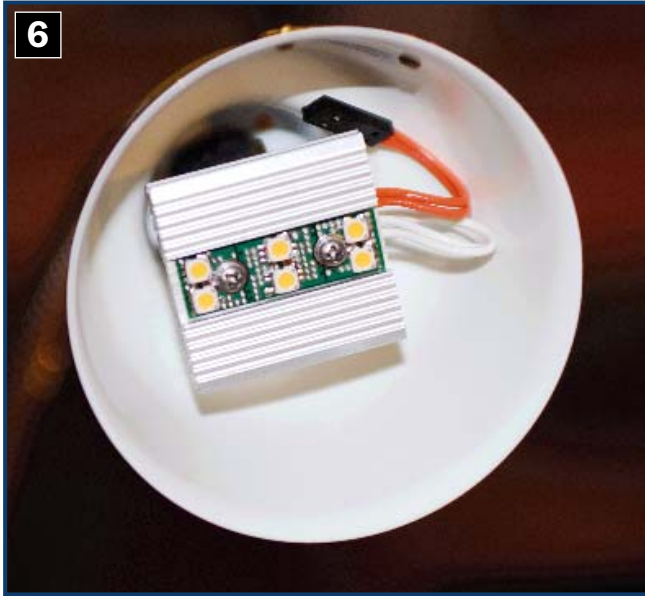
1 The circuits are energized with a fully charged battery.

2 The incandescent bulbs consume almost 5 amps; on a small trailersailer with limited battery-charging capacity this would be a serious amount of energy usage.

3 The same number of lights equipped with LEDs use a third as much power as the incandescent bulbs.

4 A traditional stern light. You can just make out the vertical bulb, which has a long filament and emits a good spread of light.

5 The LED-equivalent stern light. The LED is sealed inside. This makes the light watertight, but if it fails the whole fixture has to be replaced.



lamp's output; LED navigation lamps are USCG-approved and have a visibility of at least 2 miles; they are fully compliant with current standards.

The photos tell the story. You can see that the incandescents use over three times as much power as the LEDs—4.7 watts vs. 1.4.

Is there any reason to use incan-

descent bulbs anywhere on your boat? The answer is yes and no. LED lights save energy and are cheaper to run, but the fixtures are more expensive and the light quality is sometimes unsuitable for interior applications. If you have a powerboat, which probably has electricity to spare, using standard bulbs may be more economic. ■



6 A cabin light with a Sensibulb LED. The light output is nearly identical to the halogen equivalent. The yellow dots are the light-emitting diodes.

7 A lamp similar in size to the one shown in Photo 6, but with a halogen bulb. After 5 minutes with the light on, the shade was almost too hot to touch.