

# LED flicker health concerns

A problem arose recently when a customer of The 12 Volt Shop complained they had an increased frequency of migraine headaches when aboard their boat. In the past the migraine headaches had been triggered by flickering lights. They asked The 12 Volt Shop to investigate the likely-hood of flicker from the LED lights on their vessel as a trigger for the migraines.

Older LED lights powered by DC power were considered not to flicker. However, newer LED lighting has electronics or "drivers" incorporated to cut power consumption of the light. These "drivers" switch the LED light on and off at a rate which is imperceptible to the human eye. This rapid and repeated change over time in the brightness of light is called flicker.

In susceptible people, flicker can result in changes in the brain causing seizures or migraines. Where dimmers are used on LED lights, flicker can be even more of a problem. Examples are shown in the figure below.

There is a wide variation in the flicker produced by LED lights of different types and from different manufacturers. It can be measured with the Flicker Index and Flicker Percentage. This is not provided in

The 12 Volt Shop is an industry leader in supply of low voltage (12 V DC and 24 V DC) equipment. Our expertise covers a full spectrum of services - design, supply, installation and product support. We sell a large range of solar panels, (including Uni-Solar, Sharp, Solarex, Kyocera and BP), inverters (including SEA, Selectronics and Latronics), solar regulators, battery chargers and low voltage

the product information when LED products are purchased. Generally, products with a lower Flicker Index and Flicker Percentage are less likely to cause problems.

In order to find a solution to the customer's problem the LED lights in the boat were changed to high quality Stengel lights incorporating 11watt compact fluorescent tubes. The power consumption was not increased as one fluorescent tube could replace two to three LED lights. As a result of this change the customer's migraine headaches greatly reduced.

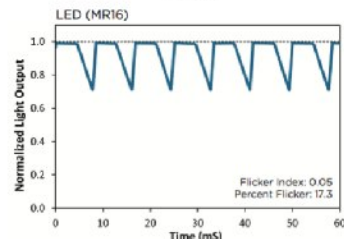
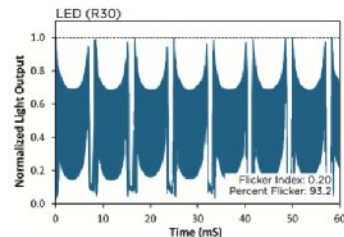
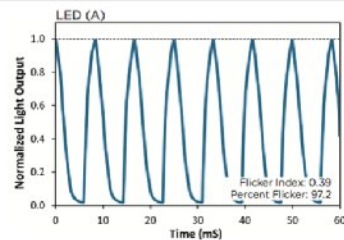
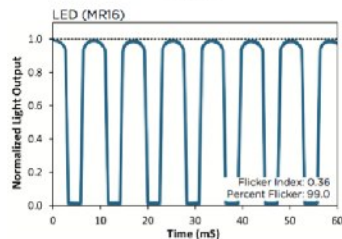
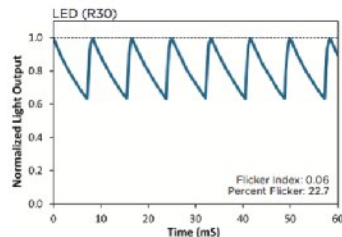
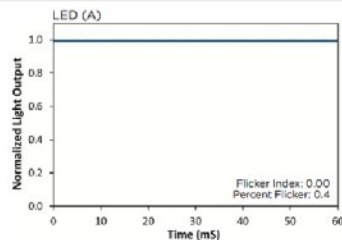
People experiencing unexplained migraine headaches or children that may have unexplained seizures should consider LED flicker as a possible cause. LED television and computer screens can also produce flicker. If the migraine headaches are caused by flicker, improvement will be seen within days of avoiding the flicker source. As with all unexplained headaches, medical opinion should be sought.

More information on LED lighting and flicker can be found via the U.S. Department of Energy website or refer to the IEEE Standard P1789.

***This article was provided for The 12 Volt Shop by Susan Godfrey, B.Sc.Appl.Sc. (Energy Studies).***

appliances (including 12 and 24 V DC lights, refrigerators, pumps and TV and Video recorders and players).

The 12 Volt Shop is a distributor for Honda, Robin and Dunlite generators. We have the largest range of low voltage connectors in Australia, including the new ARRID series of plugs, sockets and low voltage accessories.



***Flicker measurements from LED sources. Examples were chosen to demonstrate variation that can occur.***



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