

Solid State Lighting Product Safety Compliance in Australia and New Zealand

Solid state lighting (SSL) products, more commonly known as LEDs, are gaining wide acceptance due to their advantages of long life, robust construction, instant light and the promise of energy savings. However LEDs, like all other electrical products, must comply with the appropriate safety, electromagnetic compatibility (EMC), energy efficiency and trade practices requirements.

Background

A light emitting diode, or LED, is a solid state semiconductor diode that emits light. The process is called electroluminescence and the colour of the light produced is dependent on the material used to make the LED and any phosphor coating. Some form of control device is required to limit power to the LED. This device can be incorporated into a luminaire, a retrofit lamp or be a separate unit known as an LED driver, power supply or module. Like all other light sources, the LED, its driver and mounting (luminaire) must be safe. They must also be compatible to ensure claimed values of performance and life are achieved.

LED drivers

A driver is a power supply suitable for electrically operating a compatible LED. Understanding the electrical characteristics of the LED is critical to selecting the LED driver. Drivers can be current or voltage regulated to deliver a constant current/voltage as appropriate for the LED used. A dimming compatible driver is also required to enable an LED to be dimmed.

Almost all LED drivers or modules are considered high-risk electrical items and are known as prescribed items (sometimes called declared articles). As such they must comply with mandatory safety requirements before the product can be offered for sale in Australia.

Prescribed items

Prescribed items include all drivers that are separate modules—that is, standalone and external to a luminaire. An example is an LED driver used in a similar fashion to a power supply (transformer or converter) used with 50W MR 16 halogen lamps.

The formal prescribing definition used by electrical regulators is:

Power supply

An electrical device that—

- (a) provides an output not exceeding 50V a.c. or 120V ripple free d.c.; and
- (b) is a type to provide supply to separate luminaires

Class specification:

Power supply for lighting purposes—

Electronic types:

LED driver—IEC 61347.2.13 and AS/NZS 61347.1

Non-prescribed drivers include drivers that are incorporated in or an inherent part of a luminaire. The driver may be external to the luminaire. However it must be non-detachable—that is, connected by permanent means.

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Lighting Council Australia member companies have agreed to abide by a Code of Conduct. This Code includes a provision that the products they offer meet all necessary product compliance requirements.

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In the case of a driver incorporated within a luminaire, the driver must be assessed against both its own component standard and also be assessed to the relevant requirements of the standard to ensure safety of the complete system.

In all cases both the driver and luminaire must comply with the applicable safety standards. It is only the requirement for certification that marks the difference between prescribed and non-prescribed items.

The current standard for safety of LED drivers is IEC 61347.1 and IEC 61347-2-13. In addition the luminaire must be compliant to the product specific part 2 of AS/NZS 60598 and with Part 1 'General requirements'.

The standards for LED products are evolving rapidly. Some are new but many are based on long-existing requirements. Where standards are lacking, suppliers need to ensure they can demonstrate their product is compliant to safety, electromagnetic compatibility and any other requirements for their product. How to achieve this is shown in AS/NZS 3820.

Australia's SSL Quality Scheme

The rapid development in SSL technology has resulted in an increasing number of new products on the Australian market. While there are some excellent products available, the Australian market is also being subjected to underperforming product that does not live up to its supplier's claims. As a result Lighting Council Australia has introduced a certification program for companies supplying LED products. A minimum set of critical parameters are reported by participating suppliers to accurately reflect the performance of their products. Scheme participants provide test reports or other evidence to Lighting Council Australia verifying their claims. Lighting Council Australia registers the product on a database on its website (www.lightingcouncil.com.au) and authorises use of a label owned by Lighting Council indicating conformance to the parameters. The Scheme is based on a similar program introduced by the Department of Energy in the US.

The critical parameters appearing on the SSL Quality Scheme Label are:

- Luminaire efficacy
- Light output of the luminaire
- Measured input power
- Test voltage
- Correlated colour temperature
- Colour rendering index

Sample SSL Quality Label

