

TECH Q&A

How long do exit signs last?

Whenever property managers make the switch from conventional, box-style, illuminated (LED) exit signs to slimline photoluminescent exit signage from Ecoglo International, it's clear that Ecoglo's generous 10–30-year warranty* on all devices offers great peace of mind. Nevertheless, when comparing Ecoglo devices with older technologies, many customers remain confused about the so-called life expectancies of traditional illuminated exit signs – it is quite common for manufacturers of these products to quote a lamp life of 50,000 hours (5.7 years), or even 100,000 hours (11.4 years)!

What do these claims really mean, and how reliable are they? Let's start with the example of an LED-fitted traditional exit sign with a claimed 50,000-hour life expectancy.

It is important to note at the outset that this so-called life expectancy is usually limited to the LED component of the device, and not the associated circuitry, housing or driver. In other words, a conventional exit sign may expire long before the actual LED reaches its end of life.

That said, even if the associated hardware is of good quality, there are many reasons why a claimed 50,000-hour life expectancy of a traditional exit sign should be regarded as a highly variable and subjective estimate.

LEDs tend not to expire suddenly (though such random failures are a possibility with any hardware); rather, most LEDs suffer a gradual decline in brightness over time, so when a manufacturer refers to a life expectancy of 50,000 hours, what they really mean is that the LED is likely to exhibit a gradual drop in brightness every year until, after approximately 50,000 hours, it ceases to perform as rated.

The lower performance threshold for standard LED lighting is generally accepted as 70% of the luminance level that existed when the product was new. However, the relevant standard for exit signs (AS/NZS 2293.3) does not mandate this benchmark. Indeed, some manufacturers base their products' life expectancies on the time taken to reach just 30% of initial brightness, resulting in unrealistic life expectancy claims.



Ecoglo Hybrid PL Exit Sign

Estimating by Extrapolation

Another variable affecting the claimed life expectancies of traditional exit signs involves the practice of 'estimate by extrapolation', which is the basis for all lifetime claims.

It is not feasible to subject a sample of LEDs to 50,000 or 100,000 hours of continuous testing to demonstrate the actual life expectancy of the component. Instead, small samples of LEDs (perhaps just 10-20 units) are subjected to testing over a shorter timeframe, typically nine months, and the results are then extrapolated in accordance with Standard AS/NZS 2293.3 to produce a guideline life expectancy.

NB: quoted life expectancies need to be considered within the context of many variables:

(1) Electricity supply fluctuations and cuts – these can seriously shorten the life of LED electronics.

(2) LED test failure rates – protocols can allow for a 50% failure rate of samples over the nine-month test period, without affecting subsequent claims of life expectancy.

(3) Erratic rates of decline in performance – luminance levels of LEDs don't necessarily decline at an even rate, which means that test procedures spanning the initial six or nine months operation of a device might not be reliable predictors of future 'troughs and plateaus' in performance. A rapid decline in brightness, for instance, might be a trend that only becomes apparent later in the life of the product.

(4) While the internationally recognized IES TM-21 stipulates a maximum extrapolation of six times the duration of the laboratory test, AS/NZS 2293.3 has removed this restriction for exit signs. So, a nine-month lab test can be used to claim a life of 100,000 hours or more – this is an extrapolation of 15 times the test period!

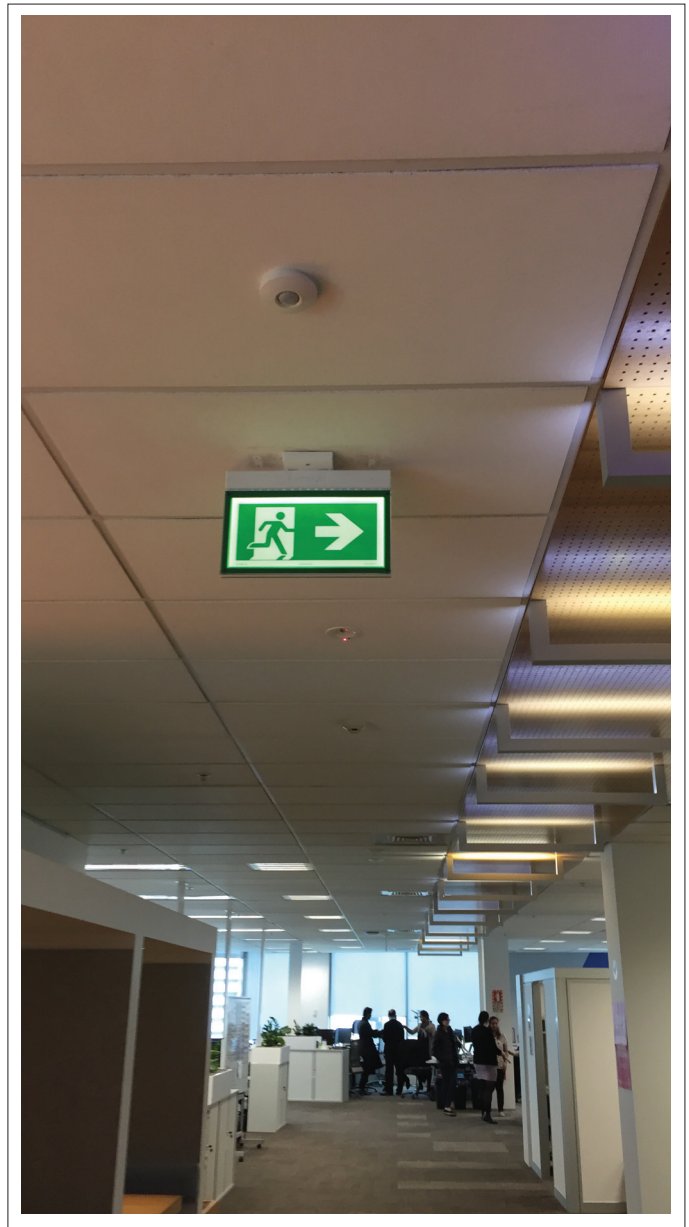
(5) Production quality and design – as mentioned above, even if a sample of LEDs performs well under test conditions, associated fittings like luminaire housings and drivers might fail long before the actual LED reaches its end of life.

Be vigilant

Claims regarding LED life expectancy and performance, therefore, need to be treated with a pinch of salt.

Products that perform poorly (or fail long before their expiry guidelines) are not just an inconvenience; they are often extremely dangerous in applications where devices must meet or exceed a specific level of brightness to ensure human safety, as is the case when a conventional illuminated LED exit sign doubles as an emergency lighting source. This can happen after only 2–3 years despite a claimed operating life of 50,000 or even 100,000 hours.

Given that facility managers are only required to check the performance levels of luminaires upon the expiry of their claimed life expectancies of 50,000 or 100,000 hours, there is a real danger



Ecoglo Hybrid PL Exit Sign in use

that prematurely non-compliant products will go unnoticed, possibly leading to litigation in the event of an accident caused by dim lighting. Needless to say, ongoing performance checks can be a costly and repetitive way of ensuring compliance.

To sum up:

(1) Always treat claimed life expectancies of box-style, illuminated, LED-based exit signs as approximate or 'guideline' estimates.

(2) Be aware that LED brightness can decline at uneven rates over the life of the device, potentially leading to the non-compliance of conventional signs at any stage of their claimed operating life.

(3) Remember that the housing, circuitry or drivers of conventional exit signs can fail long before LED components lose their effectiveness.

(4) Use alternative technologies like photoluminescent exit signs to overcome the deficiencies of conventional, box-style exit signage.

* Ecoglo exit sign warranties: 10 years (next-gen. hybrid); 30 years (passive). See at www.ecoglo.com