



TECHNICAL STATEMENT

Can Lithium-ion batteries be used in Self-contained Emergency Luminaires?

Lithium-ion (sometimes abbreviated Li-ion) is a secondary (rechargeable) battery where the lithium is only present in an ionic form in the electrolyte. Also included within the category of lithium-ion batteries are lithium polymer batteries. Lithium-ion batteries are most commonly used to power devices such as mobile telephones, laptop computers, tablets, power tools and e-bikes. Li-ion batteries are increasingly being used in self-contained emergency luminaires.

Can Li-ion batteries be used according to BS EN 60598-2-22:2014/A1:2016?

Yes, according to the emergency lighting standard, Annex A of BS EN 60598-2-22:2014/A1 covers some battery chemistry types but also allows for other battery types to be considered if they comply with their relevant safety and performance standards.

Following detailed discussions amongst experts in IEC SC34C JWG3 & SC34D JWG2*, it has been agreed that the most appropriate standards for the safety and performance of Li-ion batteries are IEC 62133 and IEC 62620 given below as the British standard equivalent:

Safety – BS EN 62133-2:2017 - Secondary cells and batteries containing alkaline or other non-acid electrolytes – Safety requirements for portable sealed secondary cells, and for batteries made from them, for use in portable applications. Lithium systems

Performance – BS EN 62620:2015 - Secondary cells and batteries containing alkaline or other non-acid electrolytes. Secondary lithium cells and batteries for use in industrial applications.

BS EN 62620:2015 contains test requirements closer to those conditions expected in an emergency luminaire condition such as elevated operating conditions and permanent charge life.

The battery should also meet the other requirements as given in BS EN 61347-2-7:2012 and BS EN 60598-2-22:2014/A1.

The IEC SC34C JWG3 & SC34D JWG2 committee is currently reviewing a proposal for additional requirements for Li-ion to be included in the next revision of IEC 60598-1 and IEC 61347-2-7. The new standards are expected to be published in 2021.

*IEC SC34C JWG3 & SC34D JWG2 is a joint working group between the control gear and the luminaire IEC standardisation committees looking solely after the maintenance and revision of the emergency luminaire and control gear standards (IEC 60598-2-22 & IEC 61347-2-7)



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Can Li-ion batteries meet the 4-year design life requirement?

This is based on the battery manufacturers' performance data. The emergency luminaire manufacturer should verify that the Li-ion battery has been tested to IEC/BS EN 62620:2015 at the expected operating temperature of the luminaire with a minimum of 40°C. The most suitable battery type/capacity should be chosen based on the discharge life cycle, battery capacity expected at 4 years and operating conditions, to meet the requirements of BS EN 60598-2-22.

It is to be noted that unlike the battery standards for NiCd and NiMH (IEC 61951-1 & IEC 61951-2) which have an accelerated ageing test to simulate 4 years of permanent charge operation at an elevated temperature, this is not explicit in the Lithium standard (IEC 62620). The emergency lighting manufacturer should check with the battery manufacturer that the Li-ion battery has been additionally tested for permanent charge life and have evidence of the 4 year life at an elevated temperature (+40°C or higher).

Are Li-ion batteries replaceable?

They can be a replaceable component of the emergency luminaire, dependent on the luminaire design, and the same labelling requirements of BS EN 60598-2-22 applies to ensure the correct type shall be used and is approved by the original manufacturer for use as a replacement.

Note that the battery chemistries are not interchangeable. Emergency luminaires designed for use with NiCd, NiMH or Li-ion batteries cannot simply be fitted with a battery of a different chemistry without a complete overhaul of the luminaire (including controlgear) and retesting to the relevant standards.