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Director
Lithium-ion Batteries Project
Consumer Product Safety Division
Australian Competition & Consumer Commission
GPO Box 3131
Canberra ACT 2601
lithiumbatteries@accc.gov.au

Lighting Council Australia response to the Lithium-ion Batteries Issues Paper

Dear Director

Lighting Council Australia appreciates the opportunity to respond to the Australian Competition & Consumer Commission's Lithium-ion Batteries Issues Paper.

We note the issues paper is primarily aimed at consumer product markets. Lighting Council Australia's response is split into two sections: The emergency & exit lighting market; and the solar lighting market. These two lighting product markets are very different in terms of the products, regulations, installations, customers and standards used. One common feature is the use of lithium batteries.

Lighting Council Australia recommends the ACCC consider these markets and products separately when considering any response in regard to lithium batteries.

304/737 Burwood Road Hawthorn VIC 3123
Tel +61 415 428 731
www.lightingcouncil.com.au
ACN 130 217 613

PO Box 1058, Hawthorn VIC 3122

dcrossley@lightingcouncil.com.au

Emergency and Exit Lighting market

The emergency and exit lighting market[1] comprises lighting products installed primarily in commercial buildings and common areas of multi-unit residential buildings by electrical contractors and that are designed to aid egress in an emergency evacuation scenario.

This market is highly regulated and standardised.

The product used are:

- The green/white 'running man' luminaires that guide occupants to an exit; and
- Battery maintained light fittings that stay on when the main power supply is cut and provide enough light so that occupants can navigate and safely negotiate the various parts of a building during evacuation.

Emergency and exit lights are primarily connected to the main electrical installation and contain a battery to maintain luminaire operation when the main electricity supply is cut.

Lighting Council Australia emergency and exit lighting suppliers report they supply more than 90% of the emergency and exit lighting market in Australia and they use lithium iron phosphate (LFP) battery technology due to its thermal stability properties and venting characteristics – lithium iron phosphate batteries do not vent with flames when they fail.

Emergency and exit lighting market regulations

The following regulations apply to emergency and exit lighting products, their installation and maintenance.

Product safety regulation: State and territory electrical safety regulations require all emergency and exit lighting luminaires to comply with *AS/NZS 3820:2020 Essential safety requirements for electrical equipment*.

The primary way emergency and exit product suppliers show compliance with AS/NZS 3820 is by demonstrating compliance with the emergency and exit lighting product standards. See below for further details regarding the relevant electrical safety and performance standards for emergency and exit luminaires.

Product installation:

- State and territory electrical installation regulations mandate that licensed electricians must install emergency and exit lighting and comply with *AS/NZS*

[1] In this context we are referring only to emergency and exit lighting products that are required to be connected to an electrical installation for their correct operation. We are not referring to photoluminescent (i.e. 'glow-in-the-dark') exit signs that are not connected to an electrical installation.

3000:2018 Wiring Rules. The Wiring Rules further requires electricians to install products as per product installation instructions.

- State and territory building regulations mandate that emergency and exit lighting installed in new buildings must comply with the requirements of the National Construction Code (NCC).

  NCC 2022, part E4 requires emergency and exit lighting systems and products to be designed and installed in compliance with *AS/NZS 2293.1 Emergency lighting and exit signs for buildings System design, installation and operation.*

Emergency and exit lighting system and product maintenance:
State and Territory Workplace Health and Safety regulations require emergency and exit lighting systems installed in commercial buildings to be tested and visually inspected annually and comply with *AS/NZS 2293.2 Emergency lighting and exit signs for buildings Routine service and maintenance.*

Emergency and exit lighting product standards

Emergency and exit lighting products must comply with the following Australian safety standards:

- *AS 60598.2.22:2019 Luminaires Particular requirements - Luminaires for emergency lighting (IEC 60598-2-22 Ed. 4.1 2017 MOD)*
- *AS 61347.2.7:2019 Lamp controlgear Particular requirements for battery supplied electronic controlgear for emergency lighting (self-contained) (IEC 61347-2-7:2017 (ED. 3.1) MOD).*

AS 60598.2.22:2019 Annex A (normative), Part A1 allows the use of lithium-ion batteries provided they conform to their relevant safety and performance standard and the relevant requirements of AS 60598.2.22:2019.

Note: The international standards for emergency luminaires and controlgear have recently been revised to incorporate requirements for lithium batteries. Standards Australia is in the process of updating the above Australian Standards to incorporate the same lithium battery requirements.

The relevant safety and performance standards for lithium batteries contained in emergency luminaires are:

- *IEC 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 - Part 2: Lithium systems.*
- *IEC 62620:2014 Secondary cells and batteries containing alkaline or other non-acid electrolytes - Secondary lithium cells and batteries for use in industrial applications.*

The following Australian standards are also relevant to the design, installation, maintenance and performance of emergency and exit lighting luminaires and installations:

- *AS/NZS 2293.1:2018 - Emergency lighting and exit signs for buildings, Part 1: System design, installation and operation*
- *AS/NZS 2293.2:2019 - Emergency lighting and exit signs for buildings, Part 2: Routine service and maintenance*
- *AS/NZS 2293.3:2018 - Emergency lighting and exit signs for buildings, Part 3: Emergency luminaires and exit signs*

Recommendation regarding the emergency and exit lighting market

Lighting Council Australia recommends no further regulatory, standards or industry code developments for the emergency and exit lighting market due to the considerable regulatory (i.e. safety and performance) and standard (i.e. safety and performance) provisions already in place for these products including lithium batteries.

Solar lighting market

Solar lights contain a photovoltaic array, battery system and luminaire to capture and store solar energy and produce light at night.

This market includes residential, commercial, industrial and public street lighting products. Lighting Council Australia members supply products into all market categories. Lighting Council Australia has published a commercial solar lighting guide[2] that provides guidance regarding lighting requirements, solar panel sizing, batteries, charge controllers and system sizing.

Solar lighting products operate at extra-low voltage (typically 12V DC or 24V DC) so are not included within the majority of state and territory electrical safety regulations.

There are currently no Australian or international standards for solar lighting products. However, *AS/NZS 4509.1:2009 Stand-alone power systems Safety and installation (Reconfirmed 2017)* is a relevant reference to use when specifying battery systems in commercial solar lighting systems.

Lighting Council Australia members in this market report they predominantly use Lithium Iron Phosphate (LiFePO or LFP) battery technology. Lithium Nickel Manganese Cobalt Oxide (Li NMC) and lead acid batteries (typically gel type) are also used in commercial solar lighting.

Lighting Council Australia members highlight the importance of system design:

- Providing system contingencies – That is, coordinating the appropriate sizing of solar panels, lighting and batteries, including spare capacity (e.g. if the sun does not shine for a few days). This minimises deep discharge of the batteries. Battery life is extended and reliability is improved.
- Battery management systems including thermal protection – The charge and discharge of batteries must be managed by a well-designed battery management system that is rated for the current that will flow into and out of the battery – This will ensure the safe operation and long life of batteries. Thermal protection (i.e. a circuit breaker) ensures the system is protected in high temperature situations and will re-start when the temperature is within safe limits.

Lighting Council Australia members report no known incidents occurring with their solar lighting products that have caused any risk to safety.

[2] https://www.lightingcouncil.com.au/wp-content/uploads/2020/04/LCA-Commercial-Solar-Lighting-Guide-2020-1.pdf

Recommendation regarding the solar lighting market

If the Australian Competition and Consumer Commission recommends the development of any measures for the solar lighting market then Lighting Council Australia recommends that it be involved in any such developments. Lighting Council Australia has good experience and demonstrated results regarding the development of industry guidance and codes.

About Lighting Council Australia

Lighting Council Australia is the peak body for Australia's lighting industry. Lighting Council's goal is to encourage the use of quality, environmentally appropriate, energy efficient lighting systems.

Yours faithfully

David Crossley

National Technical Manager
Lighting Council Australia
dcrossley@lightingcouncil.com.au