



# RQA RISK ENGINEERING REPORT

## Lithium Ion Batteries – Recall Data and Product Category Risks



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# Lithium Ion Batteries – Recall Data & Product Category Risks

## 1. Introduction

This report in RQA's series of Lithium ion battery risk engineering reports focuses on product recall data for the period 2017 – 2020. Whilst the focus of the report is product recall reports from the US CPSC, data is also presented from the EU Safety Gate (formerly RAPEX) and Product Safety Australia. Examples of recalls are referenced from national authorities and from the media; the latter to demonstrate how recalls may be presented in the press. This is often a copy of the official press release or recall notice but it may also involve more emotive and eye-catching language.

### 1.1 Causes of Lithium ion Battery Recalls

The causes of recalls involving Lithium ion batteries is not usually clear with the information provided by the US CPSC. Often there is reference in the official reports to “the battery may overheat, leak or discharge posing a fire hazard”. However it does not explicitly state why this may happen.

Possible reasons for Lithium ion battery issues include a fault in the manufacture of the battery, a fault elsewhere in the circuitry that causes overheating in the battery or it may be due to physical damage to the product and battery in the supply chain or once in use with consumers.

The EU Safety Gate recall alerts do provide more details, such as:

- “Due to the lack of battery management system, the cells in the power bank are not protected from temperatures outside their specifications; the product also lacks protection against charging currents outside their specifications.”
- “Under high ambient temperature the lithium ion cells in the power bank may fall into thermal runaway.”
- “An external short circuit can occur in the battery, leading to an internal temperature and pressure increase.”
- “A component on the circuit board may be too close to the li-ion battery”
- “Internal or charging fault could cause the High Voltage (HV) battery pack to vent hot gas.”
- “Certain cells of the high-voltage lithium-ion battery could be defective and the battery management system control software could be faulty.”

## 2. US CPSC Recall Data

A review was carried out of the US CPSC product recall reports related to recalls caused by issues with Lithium ion batteries between 1<sup>st</sup> January 2017 and 31<sup>st</sup> December 2020. In all cases, the hazard is listed as fire hazard or related issues such as risk of burn. Of the 36 recalls listed in the four year period from 2017 – 2020, 32 are for products manufactured in China, one from Korea, one from the USA, one is not listed and one is unknown (counterfeit cell phone batteries)<sup>1</sup>. The recall data is summarised in the following charts.

<sup>1</sup> Fake batteries found in Samsung smartphones. <https://www.securindustry.com/electronics-and-industrial/fake-batteries-found-in-samsung-smartphones-/s105/a5385/#.YBaOG-j7TD4>