



Lithium battery problems today

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When the battery was first invented in the 1800s, its energy storage capabilities unlocked innovation in unimaginable ways. From discs of copper and zinc held together by old-school electrolytes, the battery has evolved to the point wherein it's an essential part of everyday life. Since its inception, several types of batteries have been released into the market, such as alkaline, nickel metal hydride (NiMH), and lithium.

In addition, some uses for lithium-ion batteries, such as EVs, have external factors, such as charging rates, weather conditions, and charging practices, that affect their overall lifespan. Newark Electronics confirms that it's even possible for lithium-ion batteries to age, even without any use, due to continuous discharge. Lithium batteries can also degrade to issues beyond your control, such as due to manufacturing defects, which could lead to deadly consequences.

Typically, battery swelling is a symptom of a variety of problems. For example, this could be due to something as simple as usage, such as overcharging or using the wrong voltage. Or, the bloating could be due to something beyond your control, such as manufacturing defects like damaged membranes. Aside from the obvious cosmetic issues this brings, such as bulging cases, it can also be potentially dangerous.

New Jersey residents filed a class-action suit against Apple in 2019 due to a battery swelling problem with the Apple Watch. Considered a safety hazard, the plaintiffs claimed that the battery swelling problem was said to physically pop off or break the Apple Watch screen.

In 2021, another class action lawsuit filed in California claimed every model produced lacked any "thermal or other solution to prevent and/or mitigate the danger of a detached, shattered, or cracked Watch screen resulting from the insufficient space allocated within the device for the rectangular shaped, electromagnetically charged lithium cobalt oxide battery."

Although Court House News shares that parts of this case were dismissed, it doesn't negate the risk of personal injury that was confirmed. Aside from Apple, many other electronics companies which use lithium-ion batteries suffer from the same issue.

Because of their energy efficiency and lightweight nature, lithium-ion batteries are the top choice for many of today's electric vehicle manufacturers. Although they're relatively less prone to overheating, lithium-ion batteries can still catch fire, most commonly due to thermal runaway or uncontrollable heating. In fact, over 240 lithium-ion battery fires broke out across 64 municipal waste facilities from 2013 to 2020 in the United States (via the Environmental Protection Agency).

In 2016, Samsung permanently discontinued its Galaxy Note 7 line due to a design flaw that caused units to not just overheat but quite literally explode. This came after several users reported their Galaxy Note 7 devices

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exploding, including the replacement models. A few months after production was stopped, CNBC shared that Samsung pointed to issues with welding defects and short-circuiting lithium-ion batteries. Since then, the U.S. Consumer Product Safety Commission recall has covered 1.9 million Galaxy Note 7 phones in the United States.

While some people get away with throwing AA batteries in the trash, the EPA recommends that lithium-ion batteries should never be included in household garbage or ordinary recycling bins. Because lithium-ion batteries are prone to fire, they can cause trouble from the transport process, such as in the trucks, to the actual landfill.

Therefore, it's vital to bring your unusable lithium-ion batteries to the appropriate waste collection and recycling facilities. In addition, the EPA also recommends taping terminals and keeping them in plastic bags. However, it cautions that it's best to check specific battery manufacturers for the appropriate disposal practices.

Although there has been a newly discovered method for recycling lithium, the reality is the proper disposal of household battery items takes a lot of effort. Not everyone has the time and energy to go to certified electronics recyclers.

According to EPEC, lithium batteries clock in as the most expensive out of all the types of battery chemistries, with prices for lithium batteries ranging around \$132 per kWh in 2021. However, because they're more efficient, the cost is often justified by how long they are used.

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