

Lithium-ion battery fires are happening more often. Here's how to prevent them



By Samantha Murphy Kelly, CNN Business

(CNN) — Lithium-ion batteries, found in many popular consumer products, are under scrutiny again following a massive fire this week in New York City thought to be caused by the battery that powered an electric scooter.

At least seven people have been injured in a five-alarm fire in the Bronx which required the attention of 200 firefighters. Officials believe the incident stemmed from a lithium-ion battery of a scooter found on the roof of an apartment building. In 2022, the the New York City Fire Department responded to more than 200 e-scooter and e-bike fires, which resulted in six fatalities.

"In all of these fires, these lithium-ion fires, it is not a slow burn; there's not a small amount of fire, it literally explodes," FDNY Commissioner Laura Kavanagh told reporters. "It's a tremendous volume of fire as soon as it happens, and it's very difficult to extinguish and so it's particularly dangerous."

A residential fire earlier this week in Carlsbad, California, was suspected to be caused by an e-scooter lithium battery. On Tuesday, an alarming video surfaced of a Canadian homeowner running downstairs to find his electric bike battery exploding into flames. A fire at a multi-family home in Massachusetts last month is also under investigation for similar issues.

These incidents are becoming more common for a number of reasons. For starters, lithium-ion batteries are now in numerous consumer tech products, powering laptops, cameras, smartphones and more. They allow companies to squeeze hours of battery life into increasingly slim devices. But a combination of manufacturer issues, misuse and aging batteries can heighten the risk from the batteries, which use flammable materials.

"Lithium batteries are generally safe and unlikely to fail, but only so long as there are no defects and the batteries are not damaged or mistreated," said Steve Kerber, vice president and executive director of Underwriters Laboratory's (UL) Fire Safety Research Institute (FSRI). "The more batteries that surround us the more incidents we will see."

In 2016, Samsung issued a global recall of the Galaxy Note 7 in 2016, citing "battery cell issues" that caused the device to catch fire and at times explode. HP and Sony later recalled lithium computer batteries for fire hazards, and about 500,000 hoverboards were recalled due to a risk of "catching fire and/or exploding," according to the U.S. Consumer Product Safety Commission.

In 2020, the Federal Aviation Administration banned uninstalled lithium-ion metal batteries from being checked in luggage and said they must remain with a passenger in their carry-on baggage, if approved by the airline and between 101-160 watt hours. "Smoke and fire incidents involving lithium batteries can be mitigated by the cabin crew and passengers inside the aircraft cabin," the FAA said.

Despite the concerns, lithium-ion batteries continue to be prevalent in many of today's most popular gadgets. Some tech companies point to their abilities to charge faster, last longer and pack more power into a lighter package.

But not all lithium batteries are the same.

The problem with lithium batteries

Dylan Khoo, an analyst at tech intelligence firm ABI Research, said electric bikes and scooters use batteries which can be around 50 times larger than the one in a smartphone. "So when a fire does happen, it's much more dangerous," Khoo said.

All lithium-ion batteries use flammable materials, and incidents such as the one in the Bronx are likely the result of "thermal runaway," a chain reaction which can lead to a fire or catastrophic explosion, according to Khoo.

"This process can be triggered by a battery overheating, being punctured, or an electrical fault like a short circuit," Khoo said. "In cases where fires occur spontaneously while charging, it is likely due to manufacturing defects."

According to Kerber, the number of lithium-ion battery-based fires is growing with enormous frequency both in the United States and internationally, particularly when it

comes to e-bikes and e-scooters, due to an uptick in purchases of these products during the pandemic.

"After Covid started, scooter use went dramatically up, especially in places like New York City, for deliveries," Kerber said. "People started to get overcharged for them and turned to manufacturers which happened to have lower quality control with the battery systems. The quality manufacturers are not having issues."

"It will continue to happen until there are regulations around the quality of these devices," Kerber said.

What consumers can do

Kerber recommends people buy UL-certified electric bikes and scooters from reputable retailers; online marketplaces often make it hard for customers to tell where products are actually coming from. If a fire occurs, he advised people to evacuate and call 911 immediately rather than trying to put it out themselves.

"The fire spreads incredibly fast and a fire extinguisher is not effective," he said.

Beyond scooters and e-bikes, experts warn anyone with a lithium-ion battery should follow proper charging and battery usage guidelines. According to researchers at the University of Michigan, any device with this kind of battery should be charged and stored in a cool, dry place, and not left charging for too long or while you're asleep — a recommendation likely at odds with how many consumers handle their devices.

"Elevated temperatures can accelerate degradation of almost every battery component and can lead to significant safety risks, including fire or explosion," the researchers said. "If a laptop or cellphone is noticeably hot while it's charging, unplug it. Minimize exposure to low temperatures, especially when charging."

Batteries should also be routinely inspected to make sure there is no cracking, bulging or leaking, and people should always use the charger that came with the device or use one from a reputable supplier. When charging an electric scooter or bike, Kerber said it should never block a fire escape or exit route.

Although some battery chemistries are safer than others, we are still a few years away from adoption of a better, safer lithium-ion alternative, according to Sridhar Srinivasan, a senior director at market research firm Gartner.

For example, LFP (lithium iron phosphate) batteries don't overheat as much as other types of lithium-ion batteries. Future battery technologies in development, such as sodium-ion or solid state batteries, are also expected to address some of the safety issues of lithium ion.