

Forensic Challenges In Lithium-Ion Battery Fire Cases

By **Drew LaFramboise** (July 8, 2025)

June was a busy month for lithium-ion battery fires, with news reports of fires and explosions linked to the batteries powering a lawn mower, a Jeep, an e-bike and a portable generator.[1]

Unfortunately for manufacturers and consumers alike, these incidents are only getting more frequent. But when an incident occurs, who is to blame, and how is that determined?

Lawsuits over these fires and explosions involving Li-ion batteries often center on a core question: Was the battery defective due to a design or manufacturing defect, or did the battery combust due to some other external factor, such as misuse of the product by the consumer or end user?



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Whether attorneys are on the plaintiff or defense side of the dispute, the answer to this question will require a careful forensic examination of the battery and the circumstances surrounding the combustion.

Legal teams for each party in a case about a Li-ion battery should expect to explore the device to discover evidence pertaining to how it was produced and distributed, whether it was exposed to a wide variety of environmental factors, and how it was used. For instance, parties should make themselves aware of the term "thermal runaway" as well as what environmental conditions can increase the likelihood of a fire.

Product liability cases arising from Li-ion batteries have spread with the popularity of the products and devices that rely on these batteries — a list that also includes e-cigarettes and cell phones. The rise in popularity of Li-ion batteries is due in large part to their distinct advantages over alkaline batteries, including their energy capacity and density, life cycle and performance.

But these batteries have come with safety issues. In 2023, the New York Times reported that "over 200 micro-mobility fire or overheating incidents [including in e-bikes and scooters] have been reported from 39 states, resulting in at least 19 fatalities." [2]

In 2024, Chervon North America Inc. recalled over 60,000 Li-ion batteries that were installed in SKIL power tools and electric lawn mowers due to their risk of combustion. [3] Earlier this year, Samsung SDI Co. recalled 180,000 Li-ion battery packs installed in Chrysler, Audi AG and Ford Motor Co. electric vehicles. [4]

A common issue in product liability cases over Li-ion batteries is a phenomenon called thermal runaway — a chain reaction within the body of the battery initiated by a short circuit, which causes a sharp and uncontrolled rise in the battery temperature, destabilizing the battery's inner structures. [5]

The uncontrolled heat generation causes the release of flammable gas, which can in turn cause the battery casing to expand and explode. Certain internal and external conditions can heighten the likelihood of a Li-ion battery short circuit and, consequently, thermal runaway.

Environmental conditions, such as exposure of the battery to extreme hot or cold temperatures or moisture, can destabilize the battery, causing the separator — the porous membrane separating the anode and cathode of the battery — to deteriorate or collapse, and making the product susceptible to a short circuit.[6]

External damage to the battery, such as denting or puncturing, can similarly damage the battery and cause a short circuit between the negative and positive electrodes. If a battery does not contain sufficient external protection, such as adequate wrapping around the canister of the battery, it can short-circuit if it comes in contact with metal objects such as keys or loose pocket change.

Attorneys should forensically interrogate the internal structures and external integrity of the battery to determine whether it was defectively manufactured in a way that made the product susceptible to short circuit. The battery should be closely examined through microscopy to look for signs of wear, tear and harmful environmental exposure.

In the event of litigation arising from a Li-ion battery failure, a plaintiff attorney should fully scrutinize the path the battery took from the manufacturing floor to the end user. This includes where and under what conditions the battery was stored, handled and shipped. These facts may expose the distributor and seller to liability under strict product liability, warranty and negligence theories.[7]

On the other side of the coin, a defense attorney will undoubtedly look for evidence that the end user — often the injured plaintiff — misused or abused the battery in some fashion, or overcharged it beyond the manufacturer's recommended guidelines, causing its destabilization and failure.

In a post-incident forensic investigation, the battery should be subject to imaging and microscopy to determine the composition of the battery. Upon agreement of all parties, a destructive examination can be conducted to analyze the materials used in the product, better understand the construction of the battery and thoroughly interrogate all potential failure modes.

A potentially complicating factor in pursuing a battery manufacturer under a manufacturing defect theory is that the vast majority of Li-ion batteries are manufactured overseas, primarily in China.[8] China supplies approximately 80% of the world's Li-ion batteries.[9]

The Chinese market, in particular, is largely unregulated, without uniform safety and quality control standards for manufacturers. These batteries are often knock-offs made to resemble a battery manufactured by, for example, LG Corp. or Samsung Electronics Co. Ltd., but actually produced by companies without an American corporate connection — making them hard to find, and even harder to pursue in litigation.

Of course, under most product liability laws, any inability to pursue the direct manufacturer in litigation does not preclude the liability of the seller, the distributor or the company that incorporated the battery into its product under manufacturing defect, negligence or failure-to-warn theories.[10]

Still, litigation arising from Li-ion battery fires and explosions can be long, arduous and expensive. It will be of paramount importance to both plaintiffs' and defendants' legal counsel to secure evidence and promptly conduct forensic investigations, from both engineering and human factors perspectives, to learn as much as possible about the circumstances and causes of a battery failure.

The science behind Li-ion battery short circuits and thermal runaway is dynamic and complex. Attorneys should be sure to have their footing before stepping into this growing area of law.

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[1] <https://www.wnytv.com/2025/06/25/lawn-mower-fire-prompts-warning-about-charging-lithium-ion-batteries/>; <https://wgme.com/news/local/story/lithium-ion-battery-to-blame-for-jeep-fire-in-hollis-maine-moderation-street-state-fire-marshals-office-do-it-yourself-projects>; <https://www.cbc.ca/news/canada/manitoba/winnipeg-north-end-lithium-ion-battery-house-fire-1.7572540>; <https://www.wusa9.com/article/news/community/portable-generator-house-fire-rockville-lithium-ion-battery/65-165792dd-e4d2-46aa-98fb-d1a9f5750c01>.

[2] Winnie Hu, "How E-Bike Battery Fires Became a Deadly Crisis in New York City," The New York Times, June 21, 2023, available at <https://www.nytimes.com/2023/06/21/nyregion/e-bike-lithium-battery-fires-nyc.html>.

[3] U.S. Consumer Product Safety Commission, "Chervon North America Recalls SKIL 40V 5.0Ah Lithium-Ion Batteries for SKIL Lawnmowers and Outdoor Tools Due to Fire and Burn Hazard," Dec. 19, 2024, available at <https://www.cpsc.gov/Recalls/2025/Chervon-North-America-Recalls-SKIL-40V-50Ah-Lithium-Ion-Batteries-for-SKIL-Lawnmowers-and-Outdoor-Tools-Due-to-Fire-and-Burn-Hazard>.

[4] Eric Walz, "Samsung SDI recalls high-voltage batteries installed in 180K vehicles," Yahoo! Finance, Feb. 18, 2025, available at <https://finance.yahoo.com/news/samsung-sdi-recalls-high-voltage-152100667.html>.

[5] Sehan Shahid and Martin Agelin-Chaab, A review of thermal runaway prevention and mitigation strategies for lithium-ion batteries, ScienceDirect, Dec. 2022, Vol. 16.

[6] Ghiji, Mohammadmahdi, et al., A Review of Lithium-Ion Battery Fire Suppression, Energies, Oct. 1, 2020.

[7] Restatement (Third) of Torts, § 1 ("One engaged in the business of selling or otherwise distributing products who sells or distributes a defective product is subject to liability for harm to persons or property caused by the defect").

[8] World Economic Forum, "Charted: Where does the US lithium battery supply come from?" March 15, 2023, available at <https://www.weforum.org/stories/2023/03/charted-where-does-the-us-lithium-battery-supply-come-from/>.

[9] Ellen Wald, "The US wants to end its reliance on Chinese lithium. Its policies are doing the opposite," New Atlanticist, Jan. 23, 2024, available at <https://www.atlanticcouncil.org/blogs/new-atlanticist/the-us-wants-to-end-its-reliance->

on-chinese-lithium-its-policies-are-doing-the-opposite/.

[10] Restatement (Second) of Torts, § 402A, cmt. j. ("In order to prevent the product from being unreasonably dangerous, the seller may be required to give directions or warning, on the container, as to its use").