



Leading the way in micromobility safety



Lithium-ion battery fires: What fuels the fire?

In 2021 and 2022, the U.S. Consumer Product Safety Commission (CPSC) received reports from 39 states of at least 208 fires for overheating events that caused a reported 19 fatalities.

Overheating events of lithium-ion batteries, also known by the scientific term, Thermal Runaway, are typically caused by five factors which could result in an explosion and potentially ignite a fire:

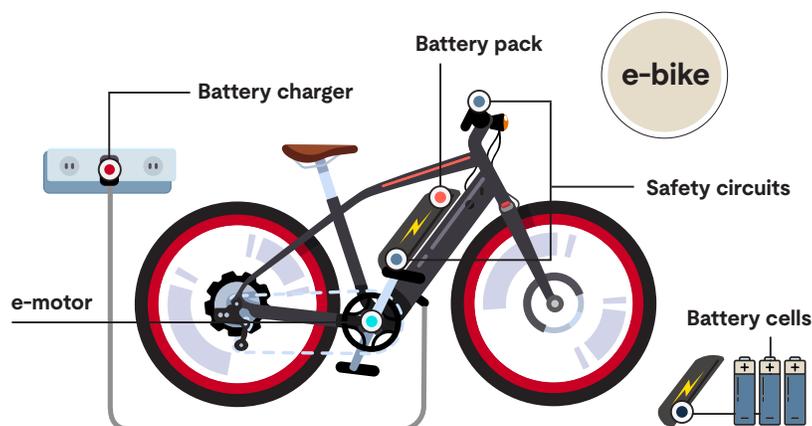
- **Environment** – Accounting for exposure to extreme temperatures (hot or cold), water and other chemicals
- **Mechanics** – Factoring in the shock and impact from daily e-bike use on the streets
- **Age** – Ensuring the battery remains safe to use each day and after each charge
- **Design** – Confirming the electrical and mechanical parts are well-assembled and reliable
- **Electrical** – Testing that charge and discharge performance remains safe and as designed



> Watch live testing of a battery experiencing Thermal Runaway.

Certifying beyond the battery: a systems approach to safety to reduce risk

UL 2849 addresses more than just the battery: The standard takes a holistic electrical systems approach to safety (see components outlined in the e-bike illustration below).



● Battery cell

- Electrical or environmental susceptibility
- Mechanical integrity

● Battery pack

- Prevention of fire propagation
- Battery management system functional safety

● Electric motor (e-motor)

- Material and electrical safety
- Control system functional safety

● Battery charger

- No electric shock or fire hazard
- Compatible to power requirement of the hose

● Electric bicycle (e-bike)

- Charge and discharging within battery limits
- Temperature within battery limits
- Susceptible to adverse conditions from application and environment
- Interrupt charging when error with host or charger

Other important micromobility-related standards:

UL 2272: personal e-mobility electrical system safety

UL 2271: battery for use in light electric vehicles applications

Learn more at www.UL.com/Contact-Us