Certifying to UL Standards saves lives

Lithium-ion batteries are only one aspect of micromobility safety. UL Standards, including UL 2849, specifically address the need to evaluate and test safety-critical materials and components, individually and as a collective system, to mitigate risk to the end user. This comprehensive approach helps to ensure that the micromobility equipment can perform safely day-to-day and charge after recharge for the consumer.

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

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

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

What fuels the fire?

Lithium-ion battery fires:

- Electrical or environmental susceptibility
- Mechanical integrity
- Battery pack
  - Prevention of fire propagation
  - Battery management system functional safety
- Battery charger
  - No electric shock or fire hazard
  - Compliant to power requirement of the home
- Electric motor (e-motor)
  - Material and electrical safety
  - Control system functional safety
- 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

UL Solutions’ expertise has guided our 10-year journey to bring our industry-leading safety science to e-bikes, e-scooters and other types of micromobility.

Once a product meets safety certification program requirements—including demonstrating conformity to consensus-based safety standards—it can significantly reduce related fire, explosion, property damage and other risks associated with micromobility equipment.

The UL Mark serves as a recognized symbol of trust in products we use every day and reflects an unwavering commitment to advancing safety science.

Not all certifications are equal. Here’s why UL Solutions is trusted:

- OSHA Nationally Recognized Test Laboratory
- ANAB and SCC accredited for product certification
- OSHA Nationally Recognized Test Laboratory
- Trains U.S. Customs and Border Protection and Department of Homeland Security to identify counterfeit UL Marks
- All applicable requirements, including testing, must be met to earn the holographic UL Mark
- Conducts regular factory visits to confirm continued product compliance
- Evaluates, tests and certifies to a full spectrum of U.S./Canadian micromobility safety standards including UL 2849, UL 2271, UL 2272 and more


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Leading the way in micromobility safety

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