



# Standards Supporting the Life Cycle of EV Batteries

An overview

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# Agenda

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EV battery life cycle – Cell safety

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EV battery life cycle – EV safety

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EV battery life cycle - Repurposing

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Standards development

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Questions

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# EV battery life cycle – Cell safety



- **UL 2580**, Standard for Batteries for Use in Electric Vehicles
- **IEC 62660-1**, Secondary lithium-ion cells for the propulsion of electric road vehicles – Part 1: Performance testing
- **IEC 62660-2**, Secondary lithium-ion cells for the propulsion of electric road vehicles – Part 2: Reliability and abuse testing
- **IEC 62660-3**, Secondary lithium-ion cells for the propulsion of electric road vehicles – Part 3: Safety requirements
- **IEC 62619**, Secondary cells and batteries containing alkaline or other non-acid electrolytes – Safety requirements for secondary lithium cells and batteries, for use in industrial applications
- **IEC 62620**, Secondary cells and batteries containing alkaline or other non-acid electrolytes – Secondary lithium cells and batteries for use in industrial applications

# EV battery life cycle – EV safety

- **UL 583**, Standard for Electric-Battery-Powered Industrial Trucks
- **UL 2271**, Standard for Batteries for Use in Light Electric Vehicle (LEV) Applications
- **UL 2272**, Standard for Electrical Systems for Personal E-Mobility Devices
- **UL 2580**, Standard for Batteries for Use in Electric Vehicles
- **UL 2849**, Standard for Electrical Systems for eBikes
- **UL 3030**, the Standard for Unmanned Aircraft Systems
- **UL 3100**, the Standard for Automated Mobile Platforms (AMPs)



# EV battery life cycle – EV safety (cont'd)

- **ISO 6469-1**, Electrically propelled road vehicles – Safety specifications – Part 1: Rechargeable energy storage system (RESS).
- **ISO 6469-2**, Electrically propelled road vehicles – Safety specifications – Part 2: Vehicle operational safety.
- **ISO 6469-3**, Electrically propelled road vehicles – Safety specifications – Part 3: Electrical safety.
- **ISO 6469-4**, Electrically propelled road vehicles – Safety specifications – Part 4: Post-crash electrical safety.
- **ISO 18243**, Electrically propelled mopeds and motorcycles — Test specifications and safety requirements for lithium-ion battery systems.
- **IEC 60335-2-114**, Household and similar electrical appliances - Safety - Part 2-114: Particular requirements for self-balancing personal transport devices incorporating batteries containing alkaline or other non-acid electrolytes
- **IEC 62619**, Secondary cells and batteries containing alkaline or other non-acid electrolytes – Safety requirements for secondary lithium cells and batteries, for use in industrial applications
- **IEC 62620**, Secondary cells and batteries containing alkaline or other non-acid electrolytes – Secondary lithium cells and batteries for use in industrial applications
- **IEC 62485-6**, Safety requirements for secondary batteries and battery installations – Part 6: Safe operation of lithium-ion batteries in traction applications

# EV battery life cycle - Repurposing

- **UL 1974**, Evaluation for Repurposing Batteries
- **IEC 63330**, Requirements for reuse of secondary batteries (*under development*)
- **IEC 63338**, General guidance on reuse and repurposing of secondary cells and batteries (*under development*)



# Standards development

- ❖ Standards play a critical role in ensuring safety of products.
- ❖ Organizations such as UL Standards & Engagement, the IEC, ISO and others play a critical role in the development of consensus standards.
- ❖ The committees developing the standards consist of a variety of stakeholders with expertise in the area covered by the standard.
- ❖ These standards can be used to evaluate EV batteries for an accepted level of safety.
- ❖ UL Standards typically cover both the USA and Canada, and are generally acceptable globally
- ❖ The IEC and ISO standards are international standards that can be adopted by countries and regions.





Thank you

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