

Electric Vehicle Battery Environmental Fact Sheet

**Division of Waste Management
Department for Environmental Protection**

Get the Facts:

Lithium-ion (Li-ion) batteries are used in many products, from everyday household electronics, toys, cell phones and power tools, and increasingly in electric vehicles and for energy storage systems. Proper management at the end of their useful life is necessary to prevent harm to human health and the environment.

The design and chemistry for li-ion batteries can vary considerably. Batteries commonly are made of materials such as aluminum, graphite, cobalt, nickel, and lithium (critical minerals) and many other assorted materials including plastics and electrolyte solvents. Critical minerals are raw materials that are an economic and strategic importance to both the nation and industry worldwide. Therefore, recycling or reclamation of these materials is vitally important.

EPA's Office of Resource Conservation and Recovery recently released additional information ([per memo 5/24/23](#)) clarifying how the hazardous waste regulations for universal waste and recycling apply to li-ion batteries. Per this guidance, EPA has identified that most li-ion batteries are likely hazardous waste ([per 40 CFR Part 261 Subpart C](#) as established in 401 KAR 39:060) at end of life due to their ignitability (D001) and reactivity (D003) characteristics, and can be managed under the universal waste standards until they reach a destination facility for final disposal or reclamation/recycling. Source: [EPA Ion- Battery website](#).

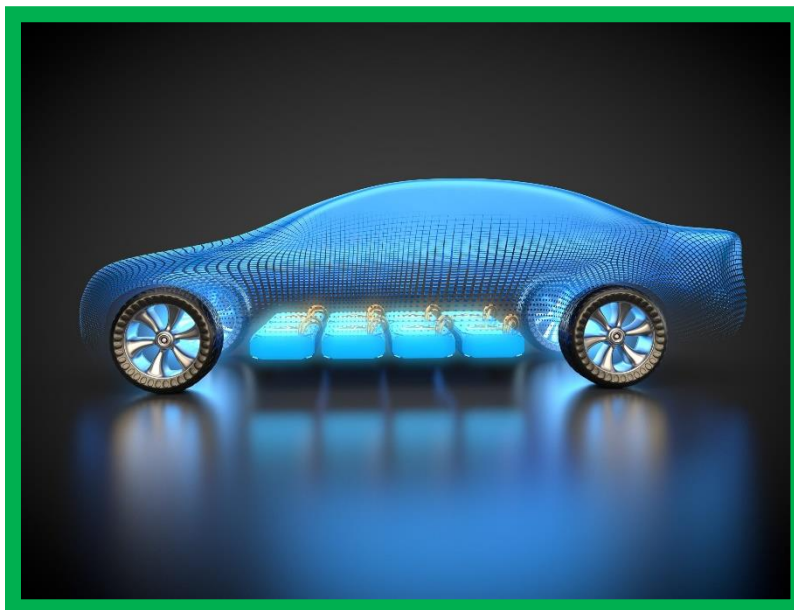


Image Source: thenextavenue.com

Lithium Cell Structure



Image Source: <https://www.autoblog.com/2007/03/14/general-motors-sfs-about-battery-development/>

Information for Businesses: Lithium-Ion Battery Management:

Lithium-ion batteries that are generated/produced by businesses are considered hazardous waste. Since the type and makeup of these batteries can vary greatly, EPA recommends all li-ion batteries be managed as hazardous waste under the federal "universal waste" regulations in [40 CFR 273](#). Therefore, these facilities may be a hazardous waste generator and must comply with the [applicable](#) requirements of their generator status per 401 KAR 39:080 and [40 CFR 262](#). Businesses in this category may be required to obtain a Hazardous Waste Generator Registration from the Kentucky Division of Waste Management.

Facilities that generate/process off-specification, used or unused Electrical Vehicle (EV) batteries will need to make a waste determination on the next life-cycle use of the battery. Typically, the next use involves one of three categories: disposal, recycling, or reclamation.

Disposal:

Generators and/or receivers of hazardous waste for disposal fall under requirements for **Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)**. Typically, some materials from recycled batteries cannot be reused and the recycler must make their own waste determination and comply with requirements according to their generator status based on requirements found in 401 KAR 39:080 and [40 CFR 262](#). TSDFs are required to obtain a RCRA Hazardous Waste Permit by 401 KAR 39:060 and 39:090 that incorporates [40 CFR 270](#).

When transferring or transporting li-ion batteries for disposal, businesses should use a licensed hazardous waste transporter to a permitted treatment, storage, and disposal facility.

Reclamation:

A battery that is removed from one device or application and is legitimately reused in another similar device or repurposed into another application is not a solid waste under the use/reuse exemption in section [261.2\(e\)\(1\)\(ii\)](#). In addition, as EPA has stated for electronics in general and for cathode ray tubes specifically, repairing electronics before resale is not considered reclamation, and such repair and replacement activities do not constitute waste management ([RCRA Online Document #14668 and 71 FR 42929-30; July 28, 2006](#)). Therefore, electronics from a business are not considered solid wastes when sent to resellers for reuse, repurposing, and/or repair and would not be subject to RCRA requirements. A battery being evaluated for use or reuse becomes a solid waste when a handler determines that it cannot continue to be used or reused and makes the decision to discard it. This determination can be done off site, but there has to be a reasonable expectation of reuse. From the point the decision is made to discard the battery, it must be managed under the universal waste requirements in [part 273](#) or the hazardous waste requirements in parts 262 through 268.

Recycling:

Removal of hazardous waste batteries from devices, sorting, battery discharge, and disassembly of batteries into cells or modules prior to recycling would not require a RCRA hazardous waste treatment permit when performed in preparation for recycling because these activities would be considered part of an exempt recycling process per [261.6\(c\)\(1\)](#). Likewise, shredding of batteries to produce black mass and separate foils and other materials for recycling are also part of an exempt recycling process.

In addition, facilities can choose to follow the **Transfer-based Exclusion** instead of the Universal Waste Destination Facility regulations. The Kentucky Hazardous Waste Program has adopted two exclusions from the definition of solid waste (DSW) (including the **Transfer-based Exclusion**) for **hazardous secondary materials** that are reclaimed.

Lithium batteries can be recycled under the definition of solid waste recycling exclusion at [40 CFR 261.4\(a\)\(24\)](#) and/or [40 CFR 261.4\(a\)\(25\)](#) as long as (1) both the batteries are generated in and recycling takes place in Kentucky or a state that has adopted this exclusion and (2) all of the conditions of the exclusion ([40 CFR 261.4\(a\)\(24\)](#) and/or [40 CFR 261.4\(a\)\(25\)](#)) are being met by all applicable parties.

Note: These requirements have implications for both the recycler and the generators of the batteries. All requirements must be met in order to meet the terms of the exclusion. Absent an exemption or exclusion meeting all the conditions for its use, when managing or treating hazardous waste, or a universal waste, the activity is subject to the requirements of Kentucky's Hazardous Waste Program and the Department of Transportation.

Requests for regulatory determinations to:

Attn: Hazardous Waste Director
Division of Waste Management
300 Sower Blvd., 2nd Floor
Frankfort, KY 40601

This document is to serve as a guide for management of lithium-ion electric vehicle batteries; it does not cover every permit or authorization. It is not a substitute for reading and understanding Kentucky's statutes and regulations governing the applicability and issuance of environmental permits and proper use, reuse, maintenance and disposal for lithium-ion batteries. Regulated entities' are encouraged to contact the Department to ensure that they receive a comprehensive understanding of all of the permits or authorizations that may apply to their unique circumstances. This document is not a substitute for Kentucky's statutes and regulations governing the applicability and issuance of environmental permits.

Additional Resources, Questions or Concerns?

Online: eec.ky.gov
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