What is a lithium-ion battery?

Identifying the tools that power our lives

Underwriters Laboratories is at the forefront of electrochemical safety science. At a time when potentially risky energy storage technologies can be found in everything from consumer products to transportation and grid storage, Underwriters Laboratories helps to lay the groundwork for energy storage designs that are safe and reliable.

What it is

Lithium-ion is the most popular rechargeable battery chemistry used today. Lithium-ion batteries consist of single or multiple lithium-ion cells, along with a protective circuit board. They are referred to as batteries once the cell, or cells, are installed inside a device with the protective circuit board.

How it works

In a lithium-ion battery, lithium ions (Li+) move between the cathode and anode internally. Electrons move in the opposite direction in the external circuit. This migration is the reason the battery powers the device—because it creates the electrical current.

While the battery is discharging, the anode releases lithium ions to the cathode, generating a flow of electrons that helps to power the relevant device.

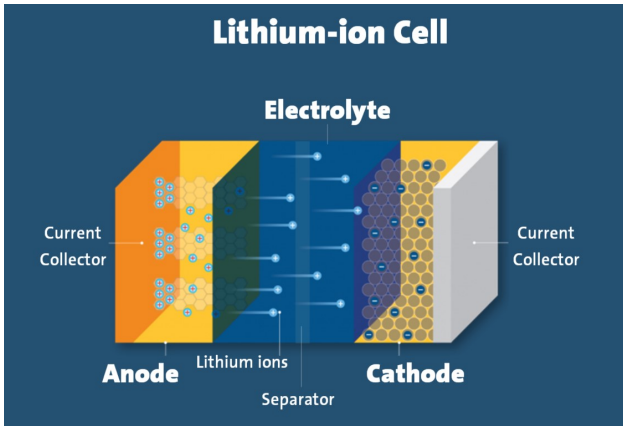
When the battery is charging, the opposite occurs: lithium ions are released by the cathode and received by the anode.

Where are lithium-ion batteries?

Lithium-ion batteries empower us to be flexible with energy storage. They make it easier to use on-the-go energy in portable products. They also enable us to store more energy from renewable sources, including wind and solar power.

Examples of devices that use lithium-ion batteries include:

- Mobile phones
- Electric vehicles
- Drones
- Wearable tech
- Headphones
- Hoverboards
- Laptops
- Power banks
- Public transit
- Satellites



UNDERWRITERS LABORATORIES®