

Comparing Lead-Acid vs Lithium-Ion Batteries.

The world is changing, and batteries are changing the way we use power as it grows into an increasingly in-demand power source. However, choosing the right battery pack solution for the application of OEMs may feel like unfamiliar territory. There are multiple parameters to consider (including voltage, safety, capacity) that make the process of selecting the best battery a complex task. We're breaking down the main differences between a lead acid battery and a lithium-ion battery for you.

LEAD-ACID



VS

LITHIUM-ION



BATTERY BASICS

- > Very heavy, but can act as a counterweight
- > Rechargeable
- > High surge currents at startup
- > Unsophisticated and simple to function
- > Heat up when charged or discharged, wasting energy
- > Efficiency can drop to as low as 50% during high use
- > Higher self-discharge rate
- > Entire battery must be replaced if 1 cell fails
- > Lower cost, but may not last through entire usage case

- > 5x lighter than lead acid battery
- > Rechargeable
- > No surge current at startup
- > "Smart" –battery management system (BMS) offers temperature monitoring, data on power utilization and voltage, the ability to integrate with Internet of Things (IoT) devices, and more
- > High energy density
- > Up to 93%+ efficiency
- > Low self-discharge rate; holds charge longer
- > Modular, more serviceable design available
- > Battery more likely to last entire life of equipment

SAFETY

- > Plates need to be continuously soaked in a liquid mixture of sulfuric acid and water to operate correctly
- > Dangerous materials; risk of being exposed to acid when watering
- > Acid-resistant PPE required when servicing
- > No safety monitoring
- > No safety backups

- > Maintenance free
- > No exposure to dangerous materials
- > No PPE required to handle battery
- > BMS constantly monitors and measures temperature, charge and discharge currents and voltages of each individual cell bank
- > Safeties in place to reduce potential of thermal runaway, including high temperature shut down

SUSTAINABILITY

- > Recyclable
- > Risk of sulfuric acid and/or lead leakage if damaged or improperly stored
- > Shorter lifecycle
- > Lower IP rating; battery becomes unusable with water intrusion
- > Emissions-free

- > Recyclable + cleaner to produce and consume
- > Particularly environmentally stable and durable
- > Longer lifecycle
- > Higher IP rating: better protection against intrusion, dust, accidental contact, water
- > Emissions-free