



RELi³ON[®]

LITHIUM-ION BATTERIES:
Separating Myth and Fact



SEPARATING MYTH AND FACT

What is the first thing you did this morning? Checked your phone or alarm for the time? You put on your watch and turned on the morning news with the remote control? After getting dressed, you started up your car and drove to work? What powered all of these actions? Batteries. In fact, the computer or mobile device you're currently reading this on is probably battery powered.

Because batteries are such an integral part of your day, you want the right ones powering your activities. That's where lithium-ion batteries come in. On the forefront of battery power, lithium is an eco-friendly alternative to the short lifespan of lead acid batteries. So how do lithium batteries differ from the traditional lead acid batteries? The energy density of lithium-ion is typically three times that of the standard lead acid battery. This means there is higher energy density potential. Essentially, it equates to more hours of usage and a lighter weight in the same or smaller sized package. Lithium-ion batteries require no maintenance and are rechargeable.

MYTH VS. FACT - THE TRUTH BEHIND LITHIUM

Lithium-ion batteries have only been on the market for a few decades, and they're changing and improving daily. However, since they're still relatively new, it's important to differentiate what you think you know about lithium versus the truth.

MYTH:
Lithium batteries are only good for powering phones and laptops.

FACT: Advancements in lithium battery technology have taken the battery's usage much further than simple handheld devices. Today, you're able to power nearly all of your adventures with long-lasting lithium-ion batteries. There are lithium batteries on the market for solar, telecom, backup UPS systems, portable power, golf carts, military vehicles, boats, RVs, floor cleaning machines, scissor lifts and electric vehicles. If a vehicle can be powered with lead acid batteries, there is a comparable lithium-ion battery on the market that's more lightweight and durable.

MYTH:
Rechargeable lithium batteries are a fire hazard.

FACT: Lithium-ion batteries are completely safe for use. Battery manufacturers include various safeguards to protect against safety hazards. For example, properly designed lithium batteries comes with a Protection Circuit Module (PCM) or Battery Management System (BMS) that protect against over-voltage, under-voltage, over-current and over-temperature. Lithium Iron Phosphate (LiFePO4) batteries are inherently safe, producing only 5% of the heat generated by other lithium chemistries.

MYTH:

The only way to charge a lithium-ion battery is with a lithium-specific charger

FACT:

With Lithium Iron Phosphate (LiFePO₄) batteries, most chargers will work since the voltage range is within the range of lead-acid batteries. The best part is, that if you under-charge a LiFePO₄ battery it will not cause any damage to the battery, and you can't over-charge a lithium battery with a PCM or BMS, as the PCM or BMS will protect the battery by disconnecting it. With chemistries other than Lithium Iron Phosphate, you may be required to change your charger due to the higher voltage requirements.

MYTH:

There isn't much of a difference in the life span for lead acid batteries and lithium-ion batteries.

FACT:

A single lithium battery lasts 10 times longer than its lead acid counterpart. The life span of batteries is measured in cycles – how many times a battery can be drained and recharged before it needs to be replaced. Flooded lead acid and VRLA batteries offer around 400-500 cycles at 80% DOD (depth of discharge) and lithium offers 5000-10000 cycles at 80% DOD. If you cycled your lithium battery once a day, it would offer more than 14 years of life, while the competition lasts less than two years. The initial cost of lithium is worth the long-term value.

MYTH:

Lithium batteries are too expensive to be practical.

FACT:

While it's true that their upfront cost is higher than that of lead acid batteries, the long-term savings of lithium-ion batteries make them the wisest energy solution. Typically, you'll pay about three times more initially for your lithium battery purchase than you would for a lead acid alternative. However, to truly understand the value of lithium, evaluate the dollar amount per cycle. When you compare cost-per-cycle, lead-acid batteries must be replaced 5-10 times before their lithium alternative would need to be replaced the first time. So, for the initial upfront cost, you receive the life span equivalent of 5-10 traditional batteries.

MYTH:

A lithium battery probably wouldn't fit my vehicle.

FACT:

There are lithium alternatives for nearly every lead acid battery on the market. But, in the off chance there isn't an alternative, custom lithium batteries are available for design and purchase. You have the option to customize everything from the battery casing to the energy output. The right lithium battery provider would offer custom services, an ideal solution for the buyer or product designer who wants to be on the forefront of green energy technology.

MYTH:

All batteries are harmful to the environment, especially when their life span is over and they need to be replaced.

FACT:

Lithium batteries are the perfect green alternative to lead acid batteries. Not only does the long life span of lithium batteries generate less waste than lead acid batteries, which are frequently purchased and thrown away, [but lithium battery parts are also recyclable](#). Some automotive manufacturers, like [Tesla Motors](#), reuse the wires, cooling fluids and even the metal of their lithium-ion batteries. In fact, many lithium ion distributors offer to [properly dispose of batteries for their customers](#).

HOW TO CHOOSE A LITHIUM-ION DISTRIBUTOR

Now that fact is separated from fiction, there are a few tips you should know about buying lithium and choosing the right distributor for your needs.

- **Find a trusted supplier.** Reputation is everything. Select a distributor known for their expertise in lithium-ion batteries. Many battery distributors sell lithium-ion, but lead acid batteries are their focus. Ideally, you should find a distributor that works primarily with lithium.
- **Never settle for second-rate customer service.** There are a lot of battery distributors out there, but you need one that offers the [best customer service on the market](#). Lithium batteries are complex, and you want to know you're getting the best battery for your energy needs. And you want a distributor that will support you after the purchase, should you have questions.
- **If you have a specific need, choose a distributor that provides custom batteries.** This saves you the hassle of trying to find a battery that simply *works* over building a battery that's ideal for your specific usage.
- **Know the questions to ask your lithium-ion distributor.** Do your research and know your energy needs. Your seller should be knowledgeable enough to answer your questions and show you all the reasons lithium is the right choice.

Lithium-ion is the energy source of the future, and the ideal battery for your needs. Let lithium batteries power your next adventure.

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Want to learn even more about lithium-ion batteries? [Click here to contact a RELiON Certified PowerPro](#) and receive guidance on making the switch to lithium-ion.

