

Lithium Ion / Polymer Batteries

Lithium ion (Li-ion) battery technologies offer increased performance over nickel and lead-based battery packs and battery assemblies. Li-ion and lithium polymer batteries can provide up to twice as much energy density as NiCD (nickel cadmium) batteries, and are capable of high discharge currents. Li-ion and lithium polymer batteries have relatively low self-discharge rates and generally have long shelf lives and life cycles.

Cornerstone offers a wide range of lithium ion and lithium polymer batteries, from mil-spec compliant rechargeable cells for military radios to ruggedized, IP67-rated li-ion batteries for portable electronics to high energy lithium-ion cells for hybrid and electric vehicles. With our huge inventory of sizes, configurations, and li-ion and lithium polymer chemistries, it's easy to find the right battery for your unique application.

Li-ion and lithium polymer cells are only sold as parts of battery pack assemblies, and are not available individually. Single cells are only available with protection circuitry installed.

If you can't find a battery that meets your requirements on this page, please visit our [custom lithium ion/lithium polymer battery pack page](#), or [contact us](#) to learn more about our custom battery packs.

[Request a quote](#) for lithium ion or lithium polymer batteries for your application, or contact Cornerstone for more information.

Lithium Iron Phosphate

Lithium iron phosphate (LFP) batteries are a variety of rechargeable lithium-ion battery. These batteries use LiFePO₄ as their cathode material, instead of the LiCoO₂ design

more common to battery packs in consumer electronic devices. LFP batteries are different than other lithium-ion batteries in several ways, and offer several distinct advantages.

Although lithium iron phosphate batteries have lower energy density than other lithium-ion chemistries, they provide better power density and longer life cycles. LFP batteries also have higher current (peak-power) ratings than LiCoO₂ batteries, and a lower self-discharge rate than LiCoO₂. LFP batteries experience a slower rate of capacity loss than other lithium-ions when not in use.

LFP batteries' LiFePO₄ cathodes also offer the safety advantage of having more thermal and chemical stability than LiCoO₂ cathodes. Because of stronger chemical bonds between the elements involved, oxygen atoms are not as readily removed from LFP cathodes due to abuse (overheating, short circuiting, etc.). In similar circumstances, LiCoO₂ batteries undergo non-linear expansion that affects the structural integrity of the cell. Oxygen loss in LiCoO₂ cells also leads to exothermic reactions which can in turn lead to ignition in the event of mishandling.

Lithium Primary Batteries

Lithium primary batteries exist in a number of different chemistries, using many varieties of cathodes and electrolytes. Lithium primary cells are a widely used consumer-grade battery and are used in many portable consumer electronic devices.

Lithium's negative potential for battery packs is higher than that of any other metal. Batteries and battery packs based on lithium chemistries have the highest specific energy (energy per unit weight) and energy density (energy per unit volume) of all battery types. Lithium cells generally have OCVs (open circuit voltages) of between 1.8

and 3.9 V. Lithium batteries maintain higher voltage for longer periods than alkaline cells in similar applications.

Though they can be more expensive than batteries using different chemistries, lithium batteries offer longer life due to their high charge density, which can offset the higher initial cost. Many lithium cells do, however, have a relatively high internal impedance which can limit them to mostly low drain applications. Special high rate lithium primary cells are available that typically have less capacity or run time than their low drain counterparts in the same size packages.

Lithium primary batteries are found in a range of sizes and formats, from small button cells to AAAs to 9-volts and completely custom battery pack designs. Small lithium cells are commonly used to power small, portable electronic devices like watches, digital cameras, calculators and remote car locks. Larger lithium cells and battery assemblies are found in many medical, defense, and industrial applications.

Please visit our custom lithium primary battery pack page for information on custom battery packs and assemblies.