

# Custom Lithium Iron Phosphate Batteries & Battery Packs

Lithium iron phosphate ( $\text{LiFePO}_4$ ), also called LFP, is one of the more recently-developed chemistries for rechargeable batteries, and is a variation of lithium ion chemistry. Rechargeable lithium iron battery packs use  $\text{LiFePO}_4$  as the cathode material.

Cornerstone manufactures custom lithium iron phosphate battery packs and assemblies for many applications. Our battery design team uses the latest mechanical and electronic design tools to optimize the reliability, safety, and manufacturability of your custom battery packs. This gives you the most cost effective and dependable rechargeable lithium iron batteries for your specific needs.

Request a quote on custom lithium iron phosphate battery packs for your application. Contact Cornerstone for more information.

## Pros and Cons of Lithium Iron Phosphate Batteries

Rechargeable lithium iron battery packs use a lithium-ion-derived chemistry that shares many of the same advantages and disadvantages with other lithium ion battery chemistries.

One advantage custom lithium iron phosphate battery packs provide is superior thermal and chemical stability, which provides better safety characteristics than lithium-ion batteries that utilize other cathode materials. Rechargeable lithium iron batteries are said to be virtually incombustible in the event of mishandling during charge or discharge, and can handle higher temperatures without significant damage. Other major advantages for  $\text{LiFePO}_4$  when compared to other Li-ion chemistries include higher rate discharge capability and longer cycle life.

Rechargeable lithium iron batteries do have some deficiencies. Their energy density, both by energy and volume, is somewhat lower than that of  $\text{LiCoO}_2$

cells and batteries. Battery manufacturers everywhere continue to work to find new ways to maximize the energy and storage performance of all battery chemistries while reducing size and weight.

While  $\text{LiFePO}_4$  cells have lower voltage and energy density than other Li-ion cells, this disadvantage is offset over time by a slower rate of capacity loss (greater calendar-life) when compared with other lithium-ion battery chemistries, such as  $\text{LiCoO}_2$  cobalt or  $\text{LiMn}_2\text{O}_4$  manganese spinel.

Like other lithium ion cells, lithium iron batteries can be specially formulated to provide either better power or energy characteristics, depending on whether a longer run time or high rate discharge is required.

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Rechargeable lithium iron battery packs have been popular choice for electric vehicles thanks to their fast-charge and hi-rate discharge capabilities and long cycle and calendar life. Power tool manufacturers have also adopted the LFP chemistry for the same reasons. Medical device manufacturers and defense contractors are adopting the LFP chemistry for its inherent safety.

- Cell Voltage: 3.2V (nominal)
- Capacity: 1Ah to 20Ah+
- Energy by Weight: 90+ Watt Hour/Kilogram
- Energy by Volume: 220 Watt Hour/cubic centimeter
- Discharge Characteristics: Power cells are hi-rate capable
- Cycle Life: 2000 to 7000 cycles.
- Self Discharge:  $\leq 3\%$  month
- Temperature Range:  $-40^\circ\text{C}$  to  $+60^\circ\text{C}$
- Preferred Charge Methods: CC/CV to
- Sizes: 18650, 26650, and large prismatic
- Applications: Electric Vehicles, Power Tools, Medical, Military

### Contact Us for Rechargeable Lithium Iron Batteries