

## BYD Batteries

### Safe and Reliable Battery Systems for Electric Trucks

In the United States, medium and heavy-duty electric trucks are now commonly deployed in various markets including food and beverage distribution, logistics, terminal operations, waste collection and more. These electric trucks require electrical energy to be stored onboard within the truck's primary battery system. This battery system must be able to safely and reliably store enough electrical energy to power the truck through its normal work day.

There are many different chemical compounds used in battery energy storage systems. One of the most advanced chemical compounds for battery energy storage is referred to as Lithium Iron Phosphate (LFP). Due to its superior properties regarding safety, longevity and reliability, the LFP battery chemistry has become widely used in many different applications, and is especially suitable for powering medium-duty and heavy-duty electric trucks.

The Lithium Iron Phosphate (LFP) compound consists of a chemical structure that is intrinsically stable. This chemistry therefore possesses extraordinary safety characteristics. The chemical bonds of the phosphate radical in the LFP battery are significantly stronger than compounds used in other battery chemistries, leading to a highly stable chemical structure even under the most extreme environmental conditions.

Lithium Iron Phosphate (LFP) batteries are currently the safest type of lithium-ion chemistry in the world, and can remain stable even when ambient temperatures reach 1,400° Fahrenheit without combustion or explosion. This provides a superior level of safety when compared to the stability, flammability and explosivity characteristics of other battery chemistries and combustible fuels currently used in transportation.

Due to the inherently safe characteristics of the LFP chemistry, the company BYD focuses its R&D efforts on advancing its LFP batteries in order to deliver the highest standard for safety, longevity and reliability. To prove this high standard, BYD batteries pass a rigorous safety testing program. This program includes tests such as short-circuit, crush, puncture, impact, water submersion, vibration, open flame, and more.

For example, when performing the thermal runaway test on BYD's LFP batteries, where chemical decomposition is purposely induced by severely overcharging the battery, it is observed that the LFP battery emits the lowest amount of heat compared to other cathode materials. In other words, when comparing the thermal characteristics of different battery chemistries, the LFP system delivers the highest level of safety.

In longevity and reliability testing, LFP batteries far exceed the cycling capabilities of other chemistries. LFP batteries possess excellent cycling stability with high kWh capacity retention throughout the entire lifecycle. In lab tests, even after 8,000 cycles at 25°C and 1C/1C cycle rate, the LFP battery maintains 81% of the battery's initial kWh

capacity. This test demonstrates that LFP batteries perform reliably and consistently over a very long life cycle.

Lithium Iron Phosphate (LFP) batteries have proven to be the safest, longest lasting and highest reliability battery systems available today. As the United States continues its transition to zero-emission transportation, demand for safe and reliable zero-emission energy systems will continue to grow. BYD provides its Lithium Iron Phosphate batteries for a wide range of applications including medium and heavy duty electric trucks.