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OUR LITHIUM-ION CELLS



THREE LITHIUM TECHNOLOGIES

With optimized electrochemical profiles and compound purity, our materials and products for battery electrodes meet the highest standards for quality, efficiency and environmental compatibility.

We offer the following technologies:

LFP

Lithium Iron Phosphate

- Safe
- Long life
- High power
- Cost-effective

Standards for fast charging & Hybrid applications.

LCO

Lithium Cobalt Oxide

- Longer life
- High power
- Ultrafast charging

Standards for motive power applications.

NMC

Lithium Nickel Manganese Cobalt oxide

- Long life
- High power
- Higher Energy density

Standards for fast charging & Hybrid applications.

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LI-ION CELLS CHARACTERISTICS

	LFP {LiFePO4}	LCO {LiCoO2}	NMC {LiNiMnCo2}
<i>Voltages</i>	3.2, 3.3V nominal, Typical operating range 2.3- 3.65V/cell	3.6V nominal, typical operating range 3.0-4.2V/cell	3.6V, 3.7V nominal, typical operating range 3.0-4.2V/cell, or higher
<i>Specific energy (capacity)</i>	90-120Wh/Kg	150-200Wh/kg Specialty cells provide up to 240Wh/Kg	150-220Wh/Kg
<i>Charge (C- rate)</i>	1C typical, charges to 3.65V, 3h charge time typical	0.7-1C, charges to 4.2V (most cells), 3h charge typical. Charge current above 1C shortens battery life	0.7-1C, charges to 4.2V, some go to 4.3V, 3h charge typical. Charge current above 1C shortens battery life
<i>Discharge (C-rate)</i>	1C, 25C on some cells, 40A pulse(2s), 2.5V cut-off (lower than 2V causes damage)	1C, 2.5V cut-off Discharge current above 1C shortens battery life	1C, 2C possible on some cells, 2.5V cut-off
<i>Cycle life</i>	2000 and higher (related to depth of discharge, temperature)	500-1000, related to depth of discharge, load, temperature	1000-2000 (related to depth of discharge temperature)
<i>Thermal runaway</i>	270°C(518°F) Very safe battery even if fully charged	150°C (302°F) full charge promotes thermal runaway	210°C (410°F) typical, High charge promotes thermal runaway
<i>Applications</i>	Portable and stationary needing high load currents and endurance	Mobile phones, tablets, laptops, cameras	E-bikes, medical devices, EVs, industrial

PILOT PRODUCTION

Advanced active materials cannot be brought to market on a large scale without mastering the intricacies of electrodes and cell technologies.

Our laboratory pilot plant has all the needed equipment, including a dry room and analytical tools, to produce highest grades lithium ion cells.


Much of the lab production effort is geared towards developing slurries with innovative cathode and anode materials.

Our pilot production, ranging between 1000 to 2000 cells per day. It meets the highest standards for coin and 18650 cell manufacturing.


STARZ is ready for an immediate ramp up of production to drastically increase capacity, all this to meet large quantity demands for very competitive pricing.



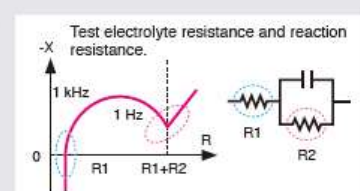
Testing and analyzing the causes of cell defects

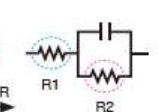


Battery Impedance Meter BT4560 / Chemical Impedance Analyzer Solartron 1296A



Test electrolyte resistance and reaction resistance.





Identify the causes of battery cell defects by measuring AC impedance at multiple frequencies. For example, you can identify batteries that have issues with electrode reactions at the electrode interface by checking impedance at low frequencies. You can also extend this approach to cover multiple channels by combining the instrument with a switching system.