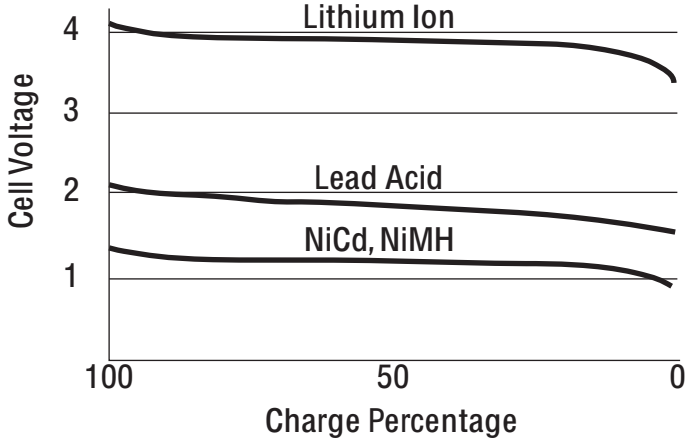
Guide to Lithium Ion Polymer Batteries

Lithium ion batteries have significant advantages over other rechargeable battery types. Lithium cells have the highest electrochemical potential and the flattest discharge curve.



Since lithium is the lightest metal on the periodic chart, the energy density (power to weight ratio) is many times higher. Lithium packs have 20% to 30% the weight and volume of other batteries with the same electrical capacity.

	Energy Density Watt hours/pound	Power Density Watts/pound
Lithium ion	59	363
NiMH	23-27	82
NiCd	18-23	86
Lead Acid	14-20	91

Lithium cells can be recycled and are much less harmful to the environment compared with batteries containing lead or cadmium.

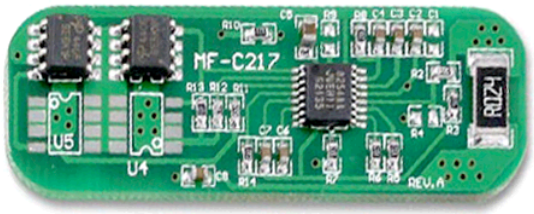
Lithium Polymer Battery Packs

Lithium polymer battery packs are built up from individual 3.7 volt cells. They are connected in series to make 7.4, 11.1, 14.8 and larger voltage packs.

Large capacity batteries are made by connecting banks in parallel. Two cells in parallel will provide the same power for twice the time. Amp hours are a measure of battery capacity.

Internal protection

Lithium polymer battery packs contain a circuit board that protects the cells against excessive charge and discharge levels.



The circuit will automatically disconnect the battery if any of the safe levels are exceeded.

Lithium Battery Chargers

A charger that is designed for lithium ion batteries must be used otherwise fire or explosion could result.

Two types of chargers are available. A series charger connects to all cells in series by attaching to the two supply wires. A balance charger connects to the individual cells in a pack using a 5 pin connector on the battery.

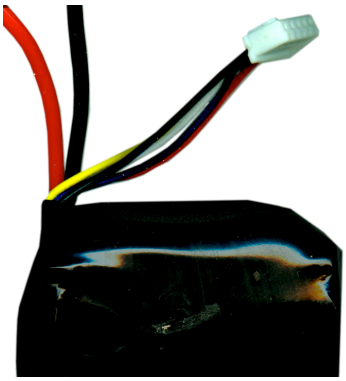
Series charger

Balance charger

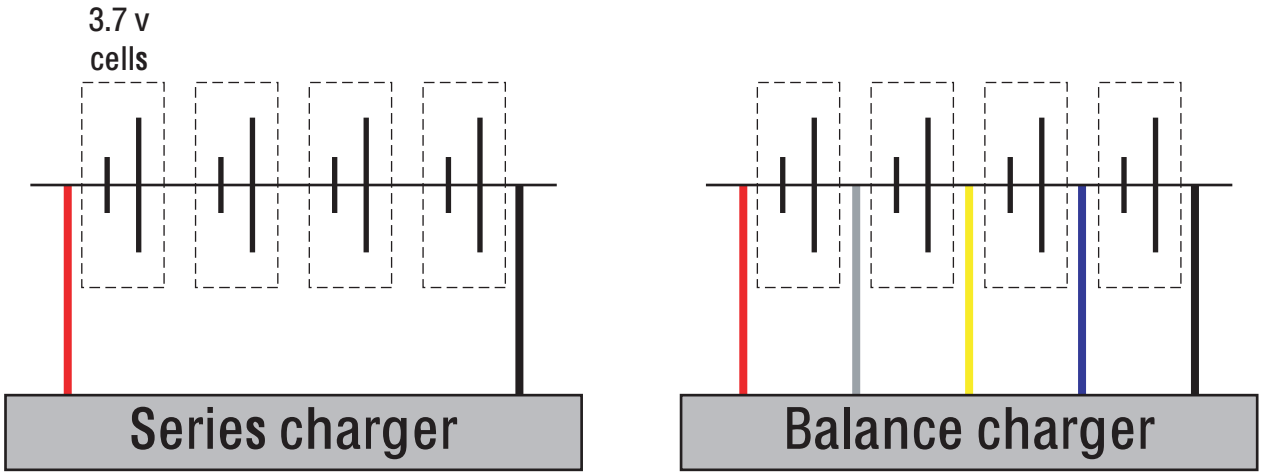
A series charger will turn off when one bank of cells is fully charged even if other banks haven't reached capacity yet. A balance charger can extend the useful lifetime of a multicell pack by fully charging each bank separately.

Charger connectors

Lithium battery packs have a balance charger connector. A series charger is connected to the red and black power wires.



Series chargers will charge faster than a balance charger. It is conventient to use a series charger most of the time and use a balance charger occasionally.



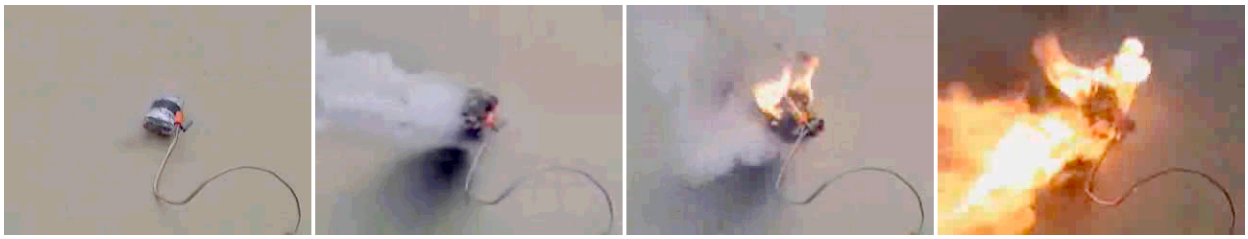
Charging precautions

Lithium polymer cells and packs are sensitive to charging characteristics and may explode if mishandled.

Always monitor the charging process to assure batteries are being charged properly. Never leave batteries unattended during charging. Charge batteries in a safe area away from flammable materials. Do not charge on wood surface or carpet.

Caution

Because of their high power density, lithium polymer batteries are volatile. They rely on protective circuitry for safe operation, but any electronic device can fail. This may result in fire, personal injury and damage to property. Make sure all users understand these dangers.



Care should be taken during transport to prevent mishandling. Most shippers will not send them by air due to the potential for fire.

Do not drop, disassemble, short circuit, reverse-connect or put in fire. Stop using a battery if it expands or starts getting hot.

Keep away from children.

LipoSack

The LipoSack is a product that is specifically designed to limit damage in case of a lithium polymer (lipo) battery meltdown. It can be used for storage during transportation or to contain the battery while charging.

http://www.liposack.com

Disclaimer

We are not responsible for any damage caused by misusing or mishandling of lithium polymer batteries.