With increased use of these battery types this article may be of interest to you.

Nickel Cadmium (Ni-Cd) or Nickel Metal Hydride (Ni-Mh) Batteries

Ni-Cd or Ni-Mh fast charge cells and larger Li-Po packs can be discharged at very high currents (up to 100 amps and more). Short circuits, faulty wire insulation or loose contacts can result in very considerable heat generation and may cause fires.

Nickel Cadmium (Ni-Cd) Batteries

(a) Ni-Cd cells will self discharge at a rate of around 20% of their capacity each month and if a stored pack discharges below approximately 1 volt per cell, there is a danger that one of the cells in the pack may be irreversibly damaged. The lower the voltage reached the more risk there is that this will happen. It is therefore recommended that all Ni-Cd packs be charged regularly, at least every few months, and that any pack not in regular use be initially stored fully charged.
(b) Ni-Cd cells are very resilient when trickle charged at around 1/10C (i.e. 50mA for a 500mA battery). Most chargers supplied with radio equipment are designed to work in this range and there is little risk involved if packs are inadvertently left on charge when using them. Even if you regularly fast charge your cells, it is good practice to trickle charge them occasionally.
(c) Overcharging Ni-Cds at high currents (fast charging) can ruin your cells and has been known to cause battery packs to explode violently. Most fast chargers have a 'delta peak' voltage controlled cut-off and are generally very reliable. If you don't have such a charger and wish to fast charge your cells then, as a minimum, you should use a charger with a timer or temperature controlled cut-off.
(d) If you have a charger capable of both discharging and charging your battery packs then you should fairly regularly cycle the packs as this will help to keep them in optimum condition. However, it is also good practice to occasionally trickle charge any packs that are regularly fast charged whether they have been cycled or not. Just make sure that the pack has been well used or discharged before you start (no lower than 1 volt per cell though).

Nickel Metal Hydride (Ni-Mh) Batteries

(a) Ni-Mh cells can self discharge at a rate of up to 40% of their capacity each month and the danger of a stored pack discharging below 1 volt per cell and possibly causing irreversible cell damage is therefore considerably greater than with Ni-Cd cells simply because it will occur sooner. It is therefore recommended that all Ni-Mh packs be charged more regularly than Ni-Cds, at least every two or three months, and that any pack not in regular use be initially stored fully charged.

(b) Ni-Mh cells may be trickle charged at around 1/10C (i.e. 50mA for a 500mA battery) and most chargers supplied with radio equipment are designed to work in this range.
However, Ni-Mh cells are more fragile than Ni-Cds and are susceptible to damage by overcharging even at normal trickle charge rates and should never be left connected to the charger longer than is necessary. The 'safe' constant trickle charge rate is very much less that that provided by the standard type of charger supplied with most radio equipment so the possibility of overcharge damage when using these trickle chargers must always be borne in mind.
(c) Ni-Mh packs can be charged at high currents (fast charging) but overcharging can quickly ruin the cells. Most fast chargers have a 'delta peak' voltage controlled cut-off and are generally very reliable but you must ensure that the one you are using is specifically designed for Ni-Mh batteries.
(d) Ni-Mh packs may be cycled, as with Ni-Cds, and you should consider doing this fairly regularly. However, it is also good practice to occasionally trickle charge any packs that are regularly fast charged whether they have been cycled or nor. Just make sure that the pack has been well used or discharged before you start (no lower than 1 volt per cell though) and note the advice in (b) above.

Other Lithium Based Batteries

Battery technology moves rapidly and there are several types of lithium based batteries now available to model flyers, including Lithium Phosphate and Lithium Manganese. These are only two of a growing selection and you can expect many more developments in the near future that will give you more capable and safer on-board power sources.
The cells now available generally have a slightly lower energy density than Li-Pos but they are not susceptible to the potential thermal runaway problems that Li-Pos may experience.
In very general terms these packs are treated in much the same fashion as Li-Pos but it must be stressed that you should follow the manufacturers/suppliers guidelines carefully.
For more information on these newer cell technologies, keep watching the commercial magazine electric flight columns and you should also be prepared to surf the net as there is a great deal of information out there.

Li-Po Basics

If you have not used Li-Pos before or do not have access to manufacturers data, the following might be of use to you. The terminology applied to Li-Po batteries can be confusing but it is actually quite simple. There are three different things to look for.

Cell configuration: You will see a battery referred to, for example, as 3s1p or 2s1p. The first two characters are simply the number of cells in the pack: 3s = 3 cells = 10.8 volts nominal, 12.6 volts fully charged. The second two characters tell you how many packs are connected to make the battery. 1p one pack of cells. Therefore 3slp is a single pack of 3 individual cells. 4s2p is two packs of four cells each, connected in parallel as one big battery.

Capacity: This is familiar to any rechargeable battery user and will usually be in milliamp hours (mAH), i.e. 700 mAH, 2000 mAH etc.

The 'C' Rating: This can be thought of as a measure of the ability of the battery to charge and discharge. In conjunction with the Capacity, it will help you decide how

quickly it can be safely charged and discharged. Most batteries have their ‘C’ rating marked on them by the manufacturer but if you do not have this information it is always wise to consider the battery to be 1 OC.

Charging Rate: To find the maximum charge rate of the battery, you simply divide the ‘C’ rating by 10 and then multiply by the capacity.

A 1OC x 700 mAH battery will simply be 1 x 700 mA (0.7 amps) maximum safe charge rate.

A IOC x 2200 mAH battery will be 1 x 2200 mAH and will take 2.2 amps maximum safe charge rate.

A 20C x 1500 mAH battery will be 2 x 1500 mAH which gives 3 amps maximum safe charge rate.

Note that the higher the ‘C’ rating, the quicker the battery can be charged.

However, for longer battery life, you can always charge at less than the maximum allowed but do not go higher. If the battery comes off the charger anything other than slightly warm, you are charging at too high a rate.

Discharge Rate: The safe maximum continuous discharge rate of the battery is the full ‘C’ rating multiplied by the capacity.

A 1OC x 700 mAH battery will have a maximum safe discharge rate of 7 amps.

A 20C x 1500 mAH battery will have a maximum safe discharge rate of 20 x 1500 mA = 30 amps.

These are reasonable figures to use as a basis for your power decisions. If you find that your model is finishing its run with the batteries more than reasonably warm, you are discharging at too high a rate and battery life will shortened. Much too high a discharge rate and you risk the same thermal runaway situation as with overcharging.
It is highly recommended that you invest in a good multimeter or powermeter so that you can monitor the current drain on the batteries in operation. Even a minor change in propeller selection can make the difference between safe and unsafe battery Operation but you won’t know unless you can monitor current levels.