

Charge up your battery know-how

Selecting the right battery technology, in the right size and at the right cost, can be tricky. Euro Energy offers some pointers.

When should you talk to a battery supplier?

Without advice, designers will often research battery technologies and draw conclusions which may be technically credible but prove later to be a commercial headache. By discussing the requirements early on, the designer may be steered to a different conclusion and avoid having a space envelope which is unsuited to the available technologies.

Is lithium always the right solution?

At present, lithium technologies provide the greatest energy density, however in static or even portable applications where light weight isn't the first priority, other technologies such as valve regulated lead acid or Ni-MH are still often a better and cheaper solution. Sometimes lithium isn't right because of environmental or life cycle considerations.

What's the best way to get impartial advice?

Look for a battery supplier who isn't tied to a single manufacturer or technology. Being guided toward a product which does not fully meet the temperature range or cycle life requirements of an application can lead to project failure. Keep an open mind.

Are rechargeable batteries cost effective?

Primary non rechargeable batteries are still the best choice in many applications. All batteries inherently suffer from self discharge and this tends to be far higher in rechargeable batteries, so unless you plan to provide a means of regular recharge, it's almost certainly better to specify a primary battery.

Will battery performance levels always be supplied?

You can expect this on a new battery, although the figures are often related to single cell tests under strict ISO test conditions, so if you challenge the performance, this must be considered. Also, chemical changes within the cell will affect performance with age. Manufacturers normally state an end of life figure of between 60 and 80 per cent of the original capacity after a given number of cycles. When choosing a battery this end of life figure needs to be considered.

Are all battery sizes standard?

All cylindrical cells are made to defined sizes and are generally interchangeable, however many cells exist outside of these standards. If you look at the range of lithium polymer cells offered by some manufacturers, there seems to be one for every application. If you try to order a few thousand you may be disappointed, yet if you need a million, they will become available. Don't get caught out with a single sourced cell or battery. You can guarantee this was developed for a large application and the cell will be withdrawn at the end of the product life, leaving you with a problem.

Are lithium batteries safe to use?

The answer, generally, is yes. The key to producing a safe battery is to build in several levels of protection to maintain it within safe limits. This is likely to include an electronic protection circuit to prevent over charge, over discharge and over current, a thermistor and thermostat or thermal fuse and a resettable fuse. Consideration must be given to the pack build to prevent mutual heating of cells and

to the end product to ensure there are no hot-spots located close to the battery, which may cause cells to become imbalanced.

Do new lithium battery packs require any testing?

After prototyping, new lithium battery designs must be tested to strict limits described in UN38.3. There's a cost for this, so if this doesn't fit your project budget, you're probably choosing the wrong technology.

Is a lithium battery viable for a small scale project?

To avoid costly testing, it's often possible to pick a standard battery that already carries UN38.3 approval. Try to avoid quirky shapes and voltages, find out what's available and plan around it. If volumes increase, then choosing a bespoke design may become an option, perhaps improving capacity.

Is battery recycling compulsory?

No, it isn't compulsory, but legislation is in place to increase overall levels of recycling. With the introduction of the batteries directive 2006/66/EC in 2006, European governments were charged with laying out their own country's specific legislation. It also made battery producers responsible for the cost of recycling.

In the UK, this directive was transcribed into law as The Batteries and Accumulators (Placing on the Market) Regulations 2008 and the Waste Batteries and Accumulators Regulations 2009. The first deals with identifying batteries as separate waste and the second with laying out a recycling framework. Battery producers have to register for compliance and provide a route for take-back, either through a compliance scheme or direct. They also must provide details of all the batteries they have placed on the market in a given year. All battery producers, including pack builders, must state their producer registration number on their paperwork so ask your supplier for their registration number.

Where are batteries heading?

At present the emphasis is on incrementally increasing the energy density of Li-Ion and lithium polymer and providing safer lower energy density lithium alternatives such as lithium iron phosphate (LiFePO₄). These technologies offer other benefits such as high cycle life and better high and low temperature performance.

Should you have a custom battery pack requirement and want to discuss your options further, please contact us on (0116) 234 0567. Alternatively, you can email info@euroenergy.co.uk