

[Battery University](#)



Is Lithium-ion the Ideal Battery?

For many years, nickel-cadmium had been the only suitable battery for portable equipment from wireless communications to mobile computing. Nickel-metal-hydride and lithium-ion emerged in the early 1990s, fighting nose-to-nose to gain customer's acceptance. Today, lithium-ion is the fastest growing and most promising battery chemistry.

The lithium-ion battery

Pioneer work with the lithium battery began in 1912 under G.N. Lewis but it was not until the early 1970s when the first non-rechargeable lithium batteries became commercially available. Lithium is the lightest of all metals, has the greatest electrochemical potential and provides the largest energy density for weight.

Attempts to develop rechargeable lithium batteries failed due to safety problems. Because of the inherent instability of lithium metal, especially during charging, research shifted to a non-metallic lithium battery using lithium ions. Although slightly lower in energy density than lithium metal, lithium-ion is safe, provided certain precautions are met when charging and discharging. In 1991, the Sony Corporation commercialized the first lithium-ion battery. Other manufacturers followed suit.

The energy density of lithium-ion is typically twice that of the standard nickel-cadmium. There is potential for higher energy densities. The load characteristics are reasonably good and behave similarly to nickel-cadmium in terms of discharge. The high cell voltage of 3.6 volts allows battery pack designs with only one cell. Most of today's mobile phones run on a single cell. A nickel-based pack would require three 1.2-volt cells connected in series.

Lithium-ion is a low maintenance battery, an advantage that most other chemistries cannot claim. There is no memory and no scheduled cycling is required to prolong the battery's life. In addition, the self-discharge is less than half compared to nickel-cadmium, making lithium-ion well suited for modern fuel gauge applications. Lithium-ion cells cause little harm when disposed.

Despite its overall advantages, lithium-ion has its drawbacks. It is fragile and requires a protection circuit to maintain safe operation. Built into each pack, the protection circuit limits the peak voltage of each cell during charge and prevents the cell voltage from dropping too low on discharge. In addition, the cell temperature is monitored to prevent temperature extremes. The maximum charge and discharge current on most packs are limited to between 1C and 2C. With these precautions in place, the possibility of metallic lithium plating occurring due to overcharge is virtually eliminated.

Aging is a concern with most lithium-ion batteries and many manufacturers remain silent about this issue. Some capacity deterioration is noticeable after one year, whether the battery is in use or not. The battery frequently fails after two or three years. It should be noted that other chemistries also have age-related degenerative effects. This is especially true for nickel-metal-hydride if exposed to high ambient temperatures. At the same time, lithium-ion packs are known to have served for five years in some applications.

Manufacturers are constantly improving lithium-ion. New and enhanced chemical combinations are introduced every six months or so. With such rapid progress, it is difficult to assess how well the revised battery will age.

Storage in a cool place slows the aging process of lithium-ion (and other chemistries). Manufacturers recommend storage temperatures of 15°C (59°F). In addition, the battery should be partially charged during storage. The manufacturer recommends a 40% charge.

The most economical lithium-ion battery in terms of cost-to-energy ratio is the cylindrical 18650 (size is 18mm x 65.2mm). This cell is used for mobile computing and other applications that do not demand ultra-thin geometry. If a slim pack is required, the prismatic lithium-ion cell is the best choice. These cells come at a higher cost in terms of stored energy.

Advantages

- High energy density - potential for yet higher capacities.
- Does not need prolonged priming when new. One regular charge is all that's needed.
- Relatively low self-discharge - self-discharge is less than half that of nickel-based batteries.
- Low Maintenance - no periodic discharge is needed; there is no memory.
- Specialty cells can provide very high current to applications such as power tools.

Limitations

- Requires protection circuit to maintain voltage and current within safe limits.
- Subject to aging, even if not in use - storage in a cool place at 40% charge reduces the aging effect.
- Transportation restrictions - shipment of larger quantities may be subject to regulatory control. This restriction does not apply to personal carry-on batteries.
- Expensive to manufacture - about 40 percent higher in cost than nickel-cadmium.
- Not fully mature - metals and chemicals are changing on a continuing basis.

The lithium polymer battery

The lithium-polymer differentiates itself from conventional battery systems in the type of electrolyte used. The original design, dating back to the 1970s, uses a dry solid polymer electrolyte. This electrolyte resembles a plastic-like film that does not conduct electricity but allows ions exchange (electrically charged atoms or groups of atoms). The polymer electrolyte replaces the traditional porous separator, which is soaked with electrolyte.

The dry polymer design offers simplifications with respect to fabrication, ruggedness, safety and thin-profile geometry. With a cell thickness measuring as little as one millimeter (0.039 inches), equipment designers are left to their own imagination in terms of form, shape and size.

Unfortunately, the dry lithium-polymer suffers from poor conductivity. The internal resistance is too high and cannot deliver the current bursts needed to power modern communication devices and spin up the hard drives of mobile computing equipment. Heating the cell to 60°C (140°F) and higher increases the conductivity, a requirement that is unsuitable for portable applications.

To compromise, some gelled electrolyte has been added. The commercial cells use a separator/ electrolyte membrane prepared from the same traditional porous polyethylene or polypropylene separator filled with a polymer, which gels upon filling with the liquid electrolyte. Thus the commercial lithium-ion polymer cells are very similar in chemistry and materials to their liquid electrolyte counter parts.

Lithium-ion-polymer has not caught on as quickly as some analysts had expected. Its superiority to other systems and low manufacturing costs has not been realized. No improvements in capacity gains are achieved - in fact, the capacity is slightly less than that of the standard lithium-ion battery. Lithium-ion-polymer finds its market niche in wafer-thin geometries, such as batteries for credit cards and other such applications.

Advantages

- Very low profile - batteries resembling the profile of a credit card are feasible.
- Flexible form factor - manufacturers are not bound by standard cell formats. With high volume, any reasonable size can be produced economically.
- Lightweight - gelled electrolytes enable simplified packaging by eliminating the metal shell.
- Improved safety - more resistant to overcharge; less chance for electrolyte leakage.

Limitations

- Lower energy density and decreased cycle count compared to lithium-ion.
- Expensive to manufacture.
- No standard sizes. Most cells are produced for high volume consumer markets.
- Higher cost-to-energy ratio than lithium-ion

Restrictions on lithium content for air travel

Air travelers ask the question, "How much lithium in a battery am I allowed to bring on board?" We differentiate between two battery types: Lithium metal and lithium-ion. Most lithium metal batteries are non-rechargeable and are used in film cameras. Lithium-ion packs are rechargeable and power laptops, cellular phones and camcorders. Both battery types, including spare packs, are allowed as carry-on but cannot exceed the following lithium content:

- 2 grams for lithium metal or lithium alloy batteries
- 8 grams for lithium-ion batteries

Lithium-ion batteries exceeding 8 grams but no more than 25 grams may be carried in carry-on baggage if individually protected to prevent short circuits and are limited to two spare batteries per person.

How do I know the lithium content of a lithium-ion battery? From a theoretical perspective, there is no metallic lithium in a typical lithium-ion battery. There is, however, equivalent lithium content that must be considered. For a lithium-ion cell, this is calculated at 0.3 times the rated capacity (in ampere-hours).

Example: A 2Ah 18650 Li-ion cell has 0.6 grams of lithium content. On a typical 60 Wh laptop battery with 8 cells (4 in series and 2 in parallel), this adds up to 4.8g. To stay under the 8-gram UN limit, the largest battery you can bring is 96 Wh. This pack could include 2.2Ah cells in a 12 cells arrangement (4s3p). If the 2.4Ah cell were used instead, the pack would need to be limited to 9 cells (3s3p).

Restrictions on shipment of lithium-ion batteries

- Anyone shipping lithium-ion batteries in bulk is responsible to meet transportation regulations. This applies to domestic and international shipments by land, sea and air.
- Lithium-ion cells whose equivalent lithium content exceeds 1.5 grams or 8 grams per battery pack must be shipped as "Class 9 miscellaneous hazardous material." Cell capacity and the number of cells in a pack determine the lithium content.
- Exception is given to packs that contain less than 8 grams of lithium content. If, however, a shipment contains more than 24 lithium cells or 12 lithium-ion battery packs, special markings and shipping documents will be required. Each package must be marked that it contains lithium batteries.
- All lithium-ion batteries must be tested in accordance with specifications detailed in UN 3090 regardless of lithium content (UN manual of Tests and Criteria, Part III, subsection 38.3). This precaution safeguards against the shipment of flawed batteries.
- Cells & batteries must be separated to prevent short-circuiting and packaged in strong boxes.

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Comments are intended for "commenting," an open discussion amongst site visitors. Battery University monitors the comments and understands the importance of expressing perspectives and opinions in a shared forum. However, all communication must be done with the use of appropriate language and the avoidance of spam and discrimination.

If you have a suggestion or would like to report an error, please use the "[contact us](#)" form or email us at: BatteryU@cadex.com. We like to hear from you but we cannot answer all inquiries. We recommend posting your question in the comment sections for the Battery University Group (BUG) to share.

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Comments

On October 20, 2010 at 5:02pm

Stefano Monti wrote:

Reading this: «Lithium-ion is a low maintenance battery, an advantage that most other chemistries cannot claim. There is no memory and no scheduled cycling is required to prolong the battery's life.» such as what we hear from PC sellers about their products long-life maintenance. Cycles of complete discharging and recharging are only for hardware and software calibration, not intended for battery life.

Thanks for the explanation.

On November 21, 2010 at 9:11am

rajusalot wrote:

li ion battery in 12 v/400 ah

On November 29, 2010 at 1:20pm

MICHAEL RIGGS wrote:

The search for a battery to power our electric cars should include an all liquid battery. Instead of having to charge the battery at home or at a charging station, I think a better idea would be to have a storage system where the liquid battery would be stored in the car until the charge is spent and then like going to the gas station you would pump out the spent liquid battery and put in a charged liquid battery. Instead of having to wait until the battery is charged (like the present situation) you would just wait until the battery (liquid) is exchanged. Another option would be to exchange a spent physical battery for unspent one. What do you think?

On December 8, 2010 at 2:59am

Carlos wrote:

My comment is. If there is a big market for this product.

Very much interested if finding out the potential to commercialize this particular Battery of lithium in global proportion

On December 18, 2010 at 5:50am

m.shen wrote:

What is the mechanism that causes some types of Lithium batteries to violently explode ?

What are the statistics of these Lithium batteries exploding ?
would 1 per thousand be correct ?

m.shen

On December 19, 2010 at 4:42pm

Stefano Monti wrote:

LiION battery would explode if the reaction create some hidrogen and in the expansion two contact give a short circuit. If the battery was made by low quality processes the percentage can be higher, but in normal circumstances, precaution like described in this article, the percentage is better: one on millions of units.

On December 20, 2010 at 8:55am

V. wrote:

I just got a lithium ion battery powered Dyson vacumn. From what I understand you are saying, it's best to prolong its life by 1) not fully charging it each time - only charging it to about 80% of full capacity and 2) storing it at 40% charge in a cool place when not in use. Is there any other practical advice?

thank you for your articles.

v.

On December 20, 2010 at 3:24pm

Rainer wrote:

Why do Lithium_ion_batteries have three electrical contacts, i.e. + (plus), -(minus) and an unmarked one? Is the latter conected to the charging (safety) circuit?

On December 21, 2010 at 2:07am

id wrote:

It is not clear to me the sentence "The maximum charge and discharge current on most packs are is limited to between 1C and 2C". "1C and 2C" should be "1A and 2A" (amps), since it refers to a current?

On December 24, 2010 at 12:43am

Imp wrote:

The C rating of a battery is its discharge rate (or it can also represent a charge rate). It is defined as the amount of current it can safely discharge over a period of time expressed in multiples of the batteries total rated capacity. A battery's C rating is equivalent to it's mah rating sustained for one hour. For example a 3000 mah battery being discharged at 1C, or 3000ma, will last one hour at that discharge rate, this equals 1C... At 0.5C (1500ma) it will last for 2 hours. That same battery being discharged at 2C (6000ma) would last 30 minutes, etc. The same principle applies to charge rates as well. Different technologies can handle different rates.

On December 28, 2010 at 5:10pm

Andrew wrote:

I would like to know if more research is done into other tehнологies (non-lithium) because this element (Lithium) is in low quantities on Earth thus beeing unwise to over-develop something based on a rare material (just a very few countries have lithium reserves). When I think what will be to replace all present petrol/diesel cars just from one developed country with lithium based energy storage will requiure more than we can find on entire planet.

An ideal battery... questionable, for the moment in small appliances yes, in next 30-40 years of course not.

On December 29, 2010 at 6:37am

Midge wrote:

I am concerned about the weather. Will freezing affect the Lithium-Ion battery on my Travel Scooter (wheelchair). I know I have to protect it from the heat. I have a spare battery, but both batteries have been left in the rental car exposed to the cold.

On December 29, 2010 at 5:15pm

JP wrote:

Andrew,

Lithium is not rare, many countries have large reserves.

Midge,

Freezing should not hurt the battery but it may reduce it's capacity when cold. They should be warmed up some before charging to take more charge.

On December 30, 2010 at 8:44pm

Midge wrote:

Thanks JP, I'll be sure to bring my batts to room temp b4 charging & won't put them in the car until just b4 I leave, so they won't be too cold to provide optimum capacity.

BTW, I have a spare because they quit without warning, unlike gel cells which give a fair reading of remaining charge. Is there an affordable & convenient device available that I can use to read the Li-Ion?

On December 31, 2010 at 11:15am

Ross wrote:

Can a Li-ion battery be used in a cordless drill which calls for a NiCd? Are they interchangeable?

On January 4, 2011 at 9:17pm

BWMichael wrote:

Ross: thats a big NO! The drill may work with a Li-ion battery if it fits, chances are it wont. But you cannot use a NiCd charger with a Li-ion battery. Lithium batteries are very sensitive and need specific chargers to control the amount of current etc.

If your drill is NiCd i suggest you stick to NiCd or NiMh batteries. And if you really want a Li-ion battery for whateva reason, go buy a Li-ion drill.

On January 6, 2011 at 12:20pm

Peter wrote:

I am having problems with a 12 volt Li-ion drill & saw. Especially in colder weather the batteries just shut down - the battery overload protection just cuts in. I get this problem with the smaller 1,5 Ah batteries but not with the 3ah ones. Could the batteries of been damaged by being kept cold - they live in my van so could be -5 at night ?. Or could the batteries have developed a fault.

Many tool shops are warning against Li-ion & are reporting lots of problems.

On January 12, 2011 at 2:12pm

Ross wrote:

Thank you for your reply BWMichael. But after further research, the answer is at least partially 'yes.' Perhaps my question should have been better stated as to 'physically' interchangeable. I understand that they require different chargers - and that is very important! I spoke with a DeWalt representative, who told me that the Li-ion and NiCd batteries were physically interchangeable on their cordless tools. And in fact, Porter-Cable makes a line of 'bare tools', which are sold without a battery - allowing the user to choose either NiCd or Li-ion. Thanks again for your input!

On January 15, 2011 at 4:54pm

Andy wrote:

I would like to remove NiCd bateries out of my 18v pack and replace with Li-ion, and use the same charger that came with the NiCd. Is this possible We have problems with the NiCd bateries constantly. I have rebuilt NiCd packs before with NiCd batteries.

On January 15, 2011 at 5:19pm

Ross wrote:

Hi Andy - NO you CANNOT charge a Li-ion battery in a NiCd charger. Each type requires a very specific charger, and it would be dangerous to attempt to do so.

On February 4, 2011 at 2:07pm

Cesar wrote:

Using batteries for SMALL Data Centers – what is next ?

Question: Do you know if APC - American Power Conversion, Eaton Products or the like have or are planning to have Lithium battery based UPS units - Uninterruptable Power Supplies. APC has the Symmetra system this unit uses "Lead acid" based batteries. This unit keeps Data Centers running during power outages in our client sites. Will Lithium be more effective than APC's current batteries - perhaps price would be too high for the market? Any ideas?

As the Global Warming effects start to appear in our state... keeping small Data Centers up and running for 24-hours and in some cases 48-hours electrical outages is critical - we need better technology!

Yes I know about standby electrical fuel/ gas generators... but for some reason (political) this is not a solution.

Thanks,

Cesar Lopez

Best Networks Inc – a Computer Networking Consulting Company in Chicago

On February 8, 2011 at 12:52am

Shibi wrote:

I have serious doubt that lithium ion batteries in Dell laptops is good or not..Is dell laps battery hav short lifetime?

...please suggest me some comments as soon as possible.....

On February 10, 2011 at 7:31am

steve wrote:

I have a Makita cordless driver/drill that I use daily in my trade and, living in Iowa, it can be less than 10 degrees F on a regular basis in winter. What is the effect of freezing on the total number of charge/discharge cycles I can expect in the life of my tool?

On February 10, 2011 at 11:09am

Don Grunke wrote:

I am interested in a nominal 24 volt 44 Ah LiFePO4 battery. What weight cost, electronics? ? ?

On February 16, 2011 at 6:12pm

tony wrote:

the life of battery ran in low or high temperature depend on the active material and discharging rate.

On March 12, 2011 at 9:28pm

Perry wrote:

I need to replace two 12V 4.5Ah NiCd batteries from a 1993 camera. Camera eats 25w and NiCd were rated to last for 1.25hrs. I bought a 12V 4800mAh Li Ion. It does not output enough power to run the camera longer than 30 or 40 seconds. It still shows 12.3VDC but does not power the cam. What did I not understand?

On March 21, 2011 at 12:18am

tony wrote:

we can see that the N-Cd battery is discharging at 0.66C as 3.6A (4.5/1.25) current, the rated power of camera is 25w, rated voltage of camera is 12V, only need 2.0A current is enough.that is the confused point i think.

your information is not enough, what kind of battery it is ,what is the model ,what is the amount ,serie or parallel.

please give us more information.

I think the battery of different kinds can not be crossed used. the rate of discharging curve is different, the inner resistance is different either.

i

On April 14, 2011 at 2:15am

Amada Zhang wrote:

- Li-ion cells are very sensitive to charging characteristics and may explode if mis-handled.
- Strongly suggest that you use the matched Li-Ion battery charger to recharge the battery pack
- Charging temperature: 0 to 45 degrees Celsius
- Discharging temperature: -20 to 60 degrees Celsius
- Storage temperature: -20 to 45

On May 9, 2011 at 4:40pm

Tami Troise wrote:

I just purchased a Casio Exilim underwater camera for my vacation. I use it for about an hour and then the camera stopped working. I thought the battery had to be charged but then it still did not work. When I checked it again the lithium battery looked like something leaked out of it and my camera will not work. Can it be that this happens to these types of batteries or can there be something wrong with the camera itself??? Someone please help!!! Thank you!

On May 15, 2011 at 10:42am

Br wrote:

I suspect that you have a moisture problem !

On May 21, 2011 at 1:36am

ales wrote:

Hi, i've purchase a not original sony li-ion battery for my camera.

After one minute of use I read this message:"Non-standard battery is used. Use the info LITHIUM battery." and the camera swich off.

The battery is the same in all aspect from the original.

Why does it possible?

Can I do something to remove the message and use it?

R

Ales

On May 22, 2011 at 5:03pm

BWMichael wrote:

Ales: Unfortunately you cannot remove the message and use this battery.

A few companies including Sony and JVC have made their genuine batteries with micro chips inside and the camera is designed to function properly only when the chip is present in the battery.

This is so aftermarket batteries cannot be purchased and you are forced to buy genuine batteries from them which they can charge as much money as they like.

On June 1, 2011 at 7:21am

tony wrote:

Ales: Unfortunately you cannot remove the message and use this battery.

A few companies including Sony and JVC have made their genuine batteries with micro chips inside and the camera is designed to function properly only when the chip is present in the battery.

This is so aftermarket batteries cannot be purchased and you are forced to buy genuine batteries from them which they can charge as much money as they like

I have to say that the brother up floor is right!

On June 1, 2011 at 7:22am

tony wrote:

the protector inner the battery is written in original information.

On June 15, 2011 at 12:44pm

Emerogork wrote:

I have a Panasonic ag-bp15p Li Ion camcorder batter that sat in the camera bag for over 8 years. I charged it and it gave me about 18 minutes to video time. I recharged it and it gave me about 3 seconds and about 10 seconds later the camcorder shut down,

Is there nay way to chock the battery back to life as I used to do with NiCads. I am aware of the high voltage and heat protection it has.

I just purchased one on lone. I wonder if I should have been concerned about shelf life.

Thoughts appreciated.

On August 27, 2011 at 4:08am

Ian wrote:

I really don't think that 18650 cells are 650 mm long.

On September 2, 2011 at 1:21pm

Jason T. wrote:

Is there a lithium ion batter that could put out enough wattage (1200 Min.) to power a hair dryer that wouldn't weigh the same as a small car?

On September 2, 2011 at 2:27pm

Emerogork wrote:

Other than needing to dry hair out in the woods, what is you r application? You might find a heavy duty inverter and sock the wits out of your car engine as it tried to keep up the voltage. I doubt you are going to find any portable cell block to do it.

On September 3, 2011 at 9:27am

Jason T. wrote:

I should have specified that I want to design a hand-held appliance with a light, durable, long-lasting battery. (And not what you may be thinking. That's been done.)

On October 16, 2011 at 4:36am

MUHAMMAD MUMTAZ wrote:

I am Marine Engineer (Chief Engineer of ocean going vessels)

Please apprise me about the New inventions in Marine batteries. Also how ithe LI-ION BATTERIES can give a better service than the conventional lead acid or the Ni-Cadmium batteries.

On October 27, 2011 at 3:05pm

Bud Dolan wrote:

Looking to replace 4 "AA" batteries with rechargeable ones for use in a lightweight led array. Nicad rechargeable "AA" only put out 1.2v so I would like a "green" alternative - any suggestions?

On March 7, 2012 at 2:43pm

Batt Guy wrote:

Like the article states, Sony commercialized the first rechargeable Li-Ion batteries in the 1990s. They had big plans for their portable electronic devices of the time, such as the Walkman, and they recognized a practical battery was necessary to enable volume sales. But lesser known is that Sony acquired this technology from Duracell in the 1980s, after Duracell gave up on it.

On March 25, 2012 at 8:50pm

James Elwood Swenor wrote:

2012MAR25, SUNDAY

" Very long-winded " - long article.

signed,

James Elwood SWENOR.

On May 4, 2012 at 3:34pm

Robert VanBuskirk wrote:

I am searching for a vendor who carries a Li-Ion battery pack for my Eton Scorpion Radio. It is a 2/3 AAA 3 cell. Can anyone help?

On May 28, 2012 at 2:47am

Steve Hoare wrote:

With ref. to the 18650 Li-ion cell, the size is 18mm x 65.2mm according to several sites.

On May 29, 2012 at 4:27am

jumpjack wrote:

How can I identify chemistry of Lithium cells of my e-scooter's battery, taking into account that they're connected in 16S6P configuration, they are cylindrical and they do not have any writing on them?

On June 30, 2012 at 12:46pm

Sanley Dornfeld wrote:

"lithium is the lightest of all metals," (in the text)

Metals carry a positive charge. Hydrogen carries a positive charge too. So Hydrogen is the lightest of all metals, with an atomic mass of only 1, where Lithium is 3.

On July 7, 2012 at 11:09pm

SOUMYA GUPTA wrote:

Is it available 1.5 v output, AA sized Lithium ion battery?
because it would be very useful for high drain devices like digital cameras with flash and ccd sensors
please help

On July 9, 2012 at 9:38am

frank panna wrote:

education

On July 10, 2012 at 10:24pm

SOUMYA GUPTA wrote:

Is it available 1.5 v output, AA sized Lithium ion battery?
because it would be very useful for high drain devices like digital cameras with flash and ccd sensors
please help

On July 20, 2012 at 1:35pm

Michael Goodger wrote:

Just as a passing piece of information on the Li-ion aging, I have a Nokia 3510i which I've had since 2003. The battery is still the original, stays on most of the time and still has a standby time of about a week. As far as my feeble memory goes the battery still performs roughly as new!
Being ignorant of battery properties I assumed that the longevity was a result of the Li-ion technology. The article would appear to suggest the opposite!

On July 30, 2012 at 7:49pm

M.Nagarajan wrote:

How many failure Ni/Cd cells can be replaced per aircraft battery and is there any limit for replacing the failure cells?

On August 18, 2012 at 9:58am

Javed wrote:

my laptop's new Li-ion battery, with an impressive time period of more than two hours, just stopped working. I can not understand why... may be it was over-heated!
What I want to ask is Why it stopped working at once as its cells were pretty good?
and If cells are still good, then can it be repaired?

On August 19, 2012 at 7:38am

M.Nagarajan wrote:

This may be a manufacturing defect of the battery. We can't repair the battery and the separator (One of the main component of the cell) of cell may be the reason for over-heating. When is it heated? while charging the battery or using the battery?

On August 21, 2012 at 12:22pm

thapelo wrote:

lithium cell is a battery that i will always recommend because it has helped me a lot,even during the dark days when friends were not there...THANKS TO YOU LITHIUM CELL!!

On August 21, 2012 at 12:26pm

thapelo mthunzi wrote:

lithium cell..THE BEST BATTERY I HAVE EVER HAD

On August 22, 2012 at 7:51am

M.Nagarajan wrote:

In Lithium-cell, The anode is Graphite over copper foil and the cathode is Lithium cobalt oxide and the separator is celgard trilayer material are the main component of the Lithium-ion cell. The electrolyte is lithium phopho hexa fluoride (LiPF6). these components hemetically sealed in Aluminium can material.

On August 24, 2012 at 6:15pm

Lloyd wrote:

So I have a Samsung Galaxy S III, my question is... Is there a need for an initial charging? Do I have to drain the battery first before the first charge? How do you optimize the battery life?

On August 25, 2012 at 8:02am

M.Nagarajan wrote:

There is no need to drain the battery, you can do charging as per the instruction given by the supplier. Need some instruments to do the optimization and It is dangerous without knowing the technique.

On August 28, 2012 at 4:15am

Javed wrote:

I got another new battery and the same happened to it within 16 hours (It stopped working). Both times laptop was very hot (may be because I do not clean often??) and so was the battery. why was the battery so hot?? I'd like to think that system's heat diffused into the battery!! 7% charge was remaining in battery for the 1st time and 34% remaining 2nd time. Both times laptop was working on battery power, and when the batteries stopped working it shut off like a AC computer whose power plug is pulled suddenly. Now both these batteries do not interact with the laptop. the message that appears on battery icon is "plugged in, charging" but no increase or decrease in the charge level. My laptop is HP Compaq 6910p. What is the real issue? Fault in laptop or just the heat?

On August 29, 2012 at 1:20am

Javed wrote:

My previous comment:

my laptop's new Li-ion battery, with an impressive time period of more than two hours, just stopped working. I can not understand why... may be it was over-heated! What I want to ask is Why it stopped working at once as its cells were pretty good? and If cells are still good, then can it be repaired?

My new comment:

I got another new battery and the same happened to it within 16 hours (It stopped working). Both times laptop was very hot (may be because I do not clean often??) and so was the battery. why was the battery so hot?? I'd like to think that system's heat diffused into the battery!! 7% charge was remaining in battery for the 1st time and 34% remaining 2nd time. Both times laptop was working on battery power, and when the batteries stopped working it shut off like a AC computer whose power plug is pulled suddenly. Now both these batteries do not interact with the laptop. the message that appears on battery icon is "plugged in, charging" but no increase or decrease in the charge level. My laptop is HP Compaq 6910p. What is the real issue? Fault in laptop or just the heat?

On September 1, 2012 at 3:32pm

Joseph Couse wrote:

Hello everyone:

Need to understand mean time to first failure in lithium-ion superpolymer. Any study has been done on this?

On October 11, 2012 at 7:11am

McKay wrote:

what are our thoughts on using the same charging station for Ni Cad and Nickel Metal Hydride?

On January 2, 2013 at 9:19pm

sreelal wrote:

If the battery is bulged is it convenient to reuse after servicing ?

On January 7, 2013 at 8:28am

OSIBAJO ANTHONY BOSUN wrote:

I am looking for a battery solution for Telecom site using lithium ion battery. Can i have a manufacturer.

On January 7, 2013 at 8:32am

OSIBAJO ANTHONY BOSUN wrote:

I am looking for a battery solution for Telecom site using lithium ion battery. Can i have a manufacturer with 2V 1000AH

On January 18, 2013 at 9:44am

suzyk wrote:

Please tell me which battery will be more effective with such specifications?

6300 mAh, 6-cells, Li-Ion with Intel Core i5-3317U (minus: no Li-Polymer)

6070 mAh, 6-cells, Li-Polymer with Intel Core i5-2467M (minus: worse processor which use more energy)

5440 mAh, 4-cells, Li-Polymer with Intel Core i5-3317U (minus: less mAh)

On January 20, 2013 at 8:18pm

M.Nagarajan wrote:

Bulged Li battery can be servicing so we can not reuse.

On February 4, 2013 at 9:11pm

Brent wrote:

General Lithium ion battery charger question.

I have a CV4 professional intelligent digital balance charger, my battery is an 8-cell, 12v lithium ion pack. When I made the purchase from CV4 they told me this was the charger I needed. Problem is, I keep going through batteries in my ATV(four wheeler). When looking into this I find stats about my charger that say "li-ion/Polymer cell count 1~6 series."

My question is, does this seem right for an 8 cell battery? Maybe I don't fully understand the stats on the charger, the rep at CV4 tells me this is the charger I need.... Why am I going through so many batteries?

On February 8, 2013 at 4:42am

Cal wrote:

@ Stefano Monti

Your assumption was the same used in FAA testing environment for the B787 but has been corrected down to two failures in less than 100'000h since! Lethal. They might have to

consider switching back to NiCad with an approx. 50kg weight penalty per battery with no more thermal runaway in cells, which cascaded to the other cells and that resulted in the fire and therefore airplanes being grounded for months now.

On February 19, 2013 at 4:30pm

peter palma wrote:

May i know which is better or durable " 18650 lithium-ion battery" or "Li-Ion Polymer"? what is there advantage/disadvantage between the 2?

On February 19, 2013 at 4:54pm

amir wrote:

Anyone knows about Mean Time to First Failure of Li-ion batteries?

On February 21, 2013 at 9:00am

M.Nagarajan wrote:

18650 Li-ion battery refer the cylindrical cells combination, 18650 refer the size of the cell, In Li-ion polymer is polymer based separator.

On February 25, 2013 at 6:19am

Venu gopal Bonthala wrote:

Hi,

Can i use a lithium ion battery charger IC to charge for lithium polymer battery??

Please suggest.

On March 17, 2013 at 2:27am

sandeep kumar wrote:

i want to know which battery i use in spy pen camera (16)gb memory because i dont know the batter i want ful detail.

thanks

On April 18, 2013 at 8:35am

We own LithiumElectricity.com - considering the sa wrote:

We own LithiumElectricity.com - considering the sale of the domain asset.

my contact below

Andrew N. Hunovice
CEO/President
WWK Holdings
wwkitchens@aol.com
410-487-2368

On July 11, 2013 at 7:42am

SMC wrote:

has any new battery technology been discovered?

On July 27, 2013 at 5:21pm

Ruth wrote:

My golf buggy with a lithium battery was immersed in a creek. Would it be safe to try the battery or is it likely to be irreversibly damaged? Thanks

On July 28, 2013 at 2:11am

jumpjack wrote:

If it didn't get damaged, it will upon turning on the key!
You must open the cart and inspect (or make inspect) the battery BEFORE turning on the cart.
Post some pictures!

On July 30, 2013 at 5:09am

n.palaniappan wrote:

everything possible in this world ,i am interested polymer based ionic electrolyte in feature lithium ion battery high energy i am central university research fellow all don't fell i will give good solution about lithium ion battery

yours faithfully
n.palaniappan

On July 30, 2013 at 2:36pm

Ruth wrote:

Thanks jumpjack. That's not good news because the motor was still going when we got it out. We disconnected it, but then a person who stopped to help turned it on. It went briefly and died. There is still water dripping out of it - 5 days now. Other than that there is no visible damage.

On July 30, 2013 at 2:55pm

jumpjack wrote:

Brushless motors are waterproof.
Batteries usually are not... but maybe just the electronics was burnt and the battery cells are still ok...

On July 31, 2013 at 12:25am

Ruth wrote:

So do you think it will be all right to try when dry?

On July 31, 2013 at 12:33pm

AIG wrote:

Having a couple of generations in industrial commercial electrics - motors & controls,
I would suggest that you take it to a professional golf or electric motor service.
While the motor and or battery may not be damaged - or at least minimally - the controls might have been shorted. Many (most of the) times they can be dried out. And, the motor can be megged for wetness at the start. Otherwise, it appears to be guessing with your pocketbook. Even then you might still be guessing, hopefully you will have reputable service people to deal with. Best wishes.

On July 31, 2013 at 2:46pm

Ruth wrote:

Thank you AIG. I've found a local repairer who is recommended.

On August 1, 2013 at 2:03am

jumpjack wrote:

Please keep us up to date! 😊

On August 1, 2013 at 2:07am

Ruth wrote:

Will do. Thanks for everyone's help.

On August 7, 2013 at 5:54pm

Ruth wrote:

The golf trolley is working! The recommended repairer said the situation was hopeless, but then the golf pro tried it and it all appears fine. However, there is still a small amount of water coming out of the battery casing and I'm concerned about its safety, so I haven't yet put in on the charger.

On August 8, 2013 at 1:23am

jumpjack wrote:

Who is a "golf pro"?

why don't you open, or make open, the battery case and dry it?

On August 8, 2013 at 2:06am

Ruth wrote:

A golf pro is a golf professional, ie someone who teaches golf and sells golf apparel and equipment. I haven't opened the battery, because it came with dire warnings about doing so.

On August 15, 2013 at 2:13am

Garrick Dee wrote:

What's the different between a Nickel Metal Hydride, a Lithium Ion and a Manganese Cobalt? Which one is the best?

On August 20, 2013 at 9:00pm

Sanjeev Jain wrote:

What would be the capacity of Lithium Ion Battery for replacement of 12 volt 7 AH Lead acid battery for solar lantern of 5watt - 12 volt solar module ?

On August 21, 2013 at 2:34am

jumpjack wrote:

@Garrick: NiMH are older technology and heavier than lithium batteries.

"lithium ion" is generic for several technologies, including Manganese Cobalt, which are present in some recent lithium batteries, but I don't know their performances.

Sometimes by "lithium ion" are referred first-generation lithium batteries (lot of energy, poor safety, Lithium-Cobalt based).

Manganese should allow better safety.

@Sanjeev:

At such low currents there's no much difference between lead and lithium; lithium becomes better at high discharge rates, for example 7 A from a 7 Ah battery (=1C rate).

I don't know the DIScharge rate of your lantern, but 5W/12V means just 0,42 A REcharge for a 7 Ah battery, which means 0.06C.

What you can do is replace the 12V/7Ah lead battery by a lithium battery with same capacity (7Ah) but 3 times lighter, or by a battery of same weight with 3 times the capacity.

In both cases, battery will last longer than lead battery.

On August 27, 2013 at 4:51am

Jason wrote:

Hi, I've been searching high and low just for some expert advice, and I've found your site care of another forum. My question is that I play golf and my golf trolley is powered by a lead acid battery, which is about 5 years old now, and slowing down, I would like to get it replaced, but not sure whether to go for a lead acid one, or a lithium one, I've read at how lighter they are, but I need an experts reasoning, part from cost, why I would go for lithium over the lead acid. Thank you very much in advance for your help.

On August 27, 2013 at 5:11am

jumpjack wrote:

I don't think it is worth the effort of switching to lithium for a golf cart: main advantage of lithium is low weight, which allows better performance in acceleration and on slopes; it also allows wider range.

I don't think a golf cart actually needs such improvements.

And a lithium battery costs 3 or 4 times a lead battery!

But if you want to experiment, look for TMF lead batteries or TPPL lead batteries: the first should be cheap and lightweight, the second expensive but they will last longer. But I don't even know if they're actually already commercially available.

On August 27, 2013 at 7:25am

Jason wrote:

Hi, Many thanks for the quick reply...I never knew batteries could be so confusing. I've taken your advice and have decided to go for lead. I have checked, and as yet, TMF and TPPL are not available yet, but I'm bombarded with either VRLA, AGM or GEL batteries. Seeing as I can't get hold of a TMF or TPPL, should I just go for a standard lead acid? I was going to go for an AGM but have read that they are not as reliable. Also, should I change my charger? I bought it from a golf retailer, and I really don't think it does the battery any favours. Would I need a specific one depending on the battery I go for? Many thanks.

On August 27, 2013 at 7:55am

jumpjack wrote:

VRLA are not recommended for electric vehicles, they do not last long. Gel are fine for a golf cart, but I don't know if you will have to change charger.

On August 27, 2013 at 8:47am

Jason wrote:

Thanks for all of your advice, greatly appreciated.

On September 7, 2013 at 1:06am

DLMohn wrote:

Just a note: most of the comments above about the life of the battery has to do with useage, heat vs cold, etc.

However, in a battery that is made up of more than one cell (depending on physical configuration), dropping the battery >> can << affect alignment and thus charging amounts. An example of this occurs with some of the cheaper power supply backup units to provide power backups for your cell phone, music/video player, laptop 'puter, etc. If you open the case, you might well find a whole bunch of "AA" battery cells, which are themselves built up of several button cell batteries (i.e. watch batteries) stacked together. Obviously, dropping one of those units can quite easily result in a mechanical / physical displacement. This would of course affect the charge storage capacity.

On September 7, 2013 at 2:23am

jumpjack wrote:

Are you serious?!? How could displacement due to drop ever "change storage capacity"? Battery will fail, or not; it will not "change"!

On September 7, 2013 at 9:24am

DLMohn wrote:

Yes, quite serious. Fumble-fingered as I am, I have experienced the reduction of storage capacity, as in a quite noticeable reduction in usage time after charging subsequent to dropping the battery (usually though, after dropping more than once). As to "how" it could happen instead of simply failing outright, I cannot say for certain since I did not autopsy the device. I could offer some conjectures. Depending on the type of battery, perhaps the ion matrix was disturbed (as in li-film?) Or, as I suggested already, in the instance of multi-celled construction, with both serial and parallel units, if one of the units (or sub-units) became "displaced" the overall capacity would surely degrade, or even fail (of course), just like an analogous string of Christmas tree lights. Again, speculatively speaking—since I haven't opened up any dropped (degraded) units.

On September 7, 2013 at 10:16am

jumpjack wrote:

It's more probable a damage to the INSIDE of a single cell rather than cells displacement: electrodes rupture?
Lithium batteries manuals suggest to trash batteries which got damaged when dropped (of course talking about big batteries, several Ah).

On November 24, 2013 at 1:01am

Juan Carlos Rangel wrote:

Michael Riggs, from November 29 2010 comment, I think your idea has been used by Tesla Motors.

<http://www.forbes.com/sites/joannmuller/2013/06/21/tesla-and-nissan-ev-battery-swap-replaces-anxiety-with-peace-of-mind/>

On December 21, 2013 at 11:02pm

vinitha wrote:

my mobile battery suddenly got bulged i dont wat to do and y.Now i want to know y it got bulged and whether it will explode.. pls need reply..

On December 22, 2013 at 4:07am

jumpjack wrote:

What is it written on the battery label?

Anyway, keep it away from any wooden or plastic object (i.e., leave it on the floor away from furniture), as if it is NOT LiFePo4 based it CAN explode/burn! (especially if LiPo based)

On December 23, 2013 at 9:02am

vinitha wrote:

thanks Mr jumpjack ..actually it is 3.7vLi-ion battery..

On December 23, 2013 at 9:08am

vinitha wrote:

yah my mom got scared n thrown into garbage...

On December 23, 2013 at 11:13am

jumpjack wrote:

Now it's too late, anyway for the records: before throwing away a battery, don't forget to put some duct tape over its terminal, to prevent short circuits in case it gets in touch with metal objects: both short circuit itself and high temperature reached by battery due to short circuit can cause a fire.

On December 23, 2013 at 10:38pm

vinitha wrote:

thanks Mr jumpjack for fast reply to my queries.. 😊

On January 30, 2014 at 10:23pm

Johnny wrote:

I got a lithium battery pack for my ski glove. On high it last for 2 hour, 4 hours for medium but on low it only last 3 hours. Why does the battery not working long on high? Does the cold weather affect the batteries from operating at its peaks power. Would it be better if I use some type of extra insulation around the battery pack so the battery would be cold.

On January 31, 2014 at 10:33am

jumpjack wrote:

All batteries (lead, lithium or whatelse) suffer in cold climate; they behave at best around 27°C, standard temperature at which they are tested (and labeled). Bot charging and discharging them at low temperature reduce their capacity/duraton.

On February 25, 2014 at 4:59pm

Michael wrote:

Can anyone tell me what the most efficient solar battery for so I can be removed off the power grid? and who manufactures it. I am having issues with the power companies about my solar rebate.

On February 26, 2014 at 11:14am

jumpjack wrote:

I think Thin Plates Pure Lead are the longer lasting. They cost more than classic lead batteries but less than lithium batteries.

On April 28, 2014 at 5:21am

Edward wrote:

Dear all , I am working in a Lithium battery company, any problem about the Lithium battery please email to me zzrm316@163.com I will provide the professional answer

On June 12, 2014 at 5:17pm

John Rupkalvis wrote:

I have two lithium ion batteries, each labeled 3.7 v, 6.4 Wh. I charged both of them fully. One now reads 3.99 volts, and runs my cell phone just fine. The other reads 4.14 volts, and the cell phone does not operate with it. What is happening? Is this too much voltage? Is there some sort of cutoff switch in either the phone or the battery if the voltage is too high? Is there a safe way to lower the voltage, other than waiting for a very long time (It has been three weeks, and the 4.14 voltage has only dropped to 4.13 volts)?

On June 24, 2014 at 5:00am

Art Lane wrote:

I am an RC model airplane flyer, using all electric motors and Lipo batteries..

I have come across Li-ion batteries from a lap top computer and was wondering, if separated, can I use three for power on my motors?? 12V or more??

The li-ion ones I have are CGR 18650 CE and each cell measures 4.14Volts now..

What is your comment on using this for my hobby??

Art.

On June 24, 2014 at 8:20pm

Edward wrote:

Dear Art

lap top computer Li-ion batteries can not to discharge at high current....but the RC model airplane need very high power , So DO NOT use this for your hobby, it is dangerous. you can buy the RC Lipo battery for your hobby

zzrm316@163.com Edward

On July 17, 2014 at 9:03am

Sylvia Heath wrote:

I have a samsung smxf44 camera which takes a lithium ion battery. There are several after market companies that offer batteries which are compatible. Recently bought one that claims will replace my camera battery model IA-BP210E. 3.7V. The battery is a Power 2000 professional digital battery. It claims to be 2400MaH which may be higher than the original battery. I understand this MaH has to do with how long the battery will keep a charge. Am I correct?

There are several companies selling replacement batteries for Samsung. I get no message on my camera that the battery is not compatible.

In any event, the battery will not fully charge or keep a charge and I am returning it.

Should I ask for a replacement or a refund?

Last question. Are lithium batteries dated so that I can tell whether I am getting an old or a new battery?

Thanks for any help you can provide.

On July 20, 2014 at 7:53pm

Edward wrote:

Dear Sylvia Heath, would you please email to me zzrm316@163.com Edward for more detail information?

On October 6, 2014 at 5:43am

jackob wrote:

in my view li-ion is best and cost effective.

On October 10, 2014 at 12:54pm

shan wrote:

I need that what is required to recharge the lithium iron battery?

On October 14, 2014 at 3:45am

Shafiq wrote:

which structure is convenient for running fruitful research in lithium ion battery?

On November 18, 2014 at 5:24am

jihad allah wrote:

dave is cool

On December 4, 2014 at 9:37am

Graham wrote:

There was a comment re Lithium not being the lightest metal and the comment mentioned Hydrogen is Atomic Mass 1 while Lithium is Atomic Mass 3 - Hydrogen however is not a metal so the text is correct Lithium is the lightest Alkali metal

On December 19, 2014 at 9:15am

franco Fabriziani wrote:

I'd like to know if there are H emission during charging phase. In other words to charge electric vehicle is possible without any special requisition. Many thanks for a your answer

On February 7, 2015 at 2:57am

Siva wrote:

li-polymer vs li-ion battery

Which one is best for the smart phone (has a config 4G n/w, 2GHz processor, 2GB RAM, 13 MP cam)

On March 8, 2015 at 1:59am

Om Shanker Tiwari wrote:

I use Li ion battery in daily life. Which is the best.

On March 12, 2015 at 7:37am

Graham Hales wrote:

These large 18 volt rechargeable batteries, in power tools, what is the cost to recharge them each time. I read that a mobile phone battery, charged every day, would be around ten cents for the whole year. How do these huge heavy batteries compare?

On March 24, 2015 at 6:49am

Darren wrote:

I'm replacing a 7.2v Varta 250mAh NiMH backup battery pack from an appliance that has an 8.4v constant charge. I was intending to replace the battery with 2pc of ICR14500 (7.2v) with protection chip built in.

My question is, regardless of performance, life, suitability, etc. Will the ICR battery explode or just fail?

On March 29, 2015 at 6:34am

William Wagner wrote:

I use a Turnigy 5000mAh 4s1P 14.8v 20C hardcase pack in my ultralight. After leaving it in the plane for a month or so, with temps in the teens and twenties, I got only a series of clicks when I tried to start the plane. I removed the battery and charged it in my balance charger to full capacity. The plane will now start. Do you think the freezing weather harmed the battery in the long run or will it take several of these freezing episodes to damage it? Probably I should take it out of the plane if freezing temperatures are expected. What do you think?

On April 3, 2015 at 3:05am

Surender wrote:

I have Li-ion battery in my mobile and a power bank which is Li-poly battery. Can I use that power bank to charge my mobile

On April 4, 2015 at 4:07am

Tom wrote:

Hello all- My "out in the woods" surveillance camera uses 8 AA batteries. In eastern PA, with use from April to October (staying always outdoors), low temp can be expected around 0 F., and it is late at night that I would expect the camera to be tripped (if at all). It is not very active as it is surveillance. I don't want to buy more than one set of batteries per season (is that possible?) and I don't want to spend any more than necessary. I can go rechargeable or disposable. So, for examples- alkaline is bad in the cold, lithium is expensive, lithium-ions recharge unevenly, etc.

What should I buy?

On April 4, 2015 at 3:46pm

Tom wrote:

Oops, I mean (above) freezing, not 0.

On April 23, 2015 at 4:32pm

Pedram wrote:

I have some informatio about:

" Various additives for applicable electrolytes at the lithium-ion batteries "

Thank you for your attention.

On May 15, 2015 at 8:47am

Scotti wrote:

My employer just invested in a new universal remote that has a lithium ion battery in it. It is replacing another remote that also used a lithium ion battery. The battery on the old remote didn't seem to last longer than a year. I live on an island that is very humid and surrounded by the ocean, it doesn't sound like it is worth keeping an extra battery around, should the current one start to fail. I need to make sure that remote is always operational. Any suggestions?

On May 20, 2015 at 3:55am

Shivam Lal wrote:

What is the difference between the carbon electrode used in Li ion batteries and a normal Leclanche cell?

On May 31, 2015 at 9:15am

Joe wrote:

I have read through the thread and have not seen this question.

I am running a survey robotic total station using Li-ion batteries and looking for compatible replacements/extras. What are the differences in batteries marked Li-ion20 and Li-ion00 or batteries just marked Li-ion? Should they be compatible?

Thanks for any explanations.

On June 8, 2015 at 5:16am

Rod Northover wrote:

On purchase of a new 3.7v volt rechargeable (mob ph) lithium battery some suppliers advise to full charge 4 times before use (8 hour charge period), others make no mention of this. What is accepted initialising and discharge current of a new battery before use please

On June 15, 2015 at 1:17pm

Rev. Bob Liichow wrote:

What batteries would serve best in portable solar kits. Kits that use a 10 watt panel, 10 amp charge controller and a 100 watt inverter! Currently using 2, 10 amp hour acid sealed batteries which provide 6 hours of KED light via 3, 5 watt bulbs and a 2.5 watt LED fan. Thanks

Thanks.

On June 19, 2015 at 7:15am

Disha Gupta wrote:

I was using Cu foil for Lithium titanium oxide electrode coating. However, the Cu foil is interfering with my energy spectra. Is there any other alternatives to avoid this problem?

Thanks in advance.

On August 18, 2015 at 12:48am

mark walton wrote:

Why would a lithium ion handheld radio battery in place in a charger explode producing what appears a lot of explosive energy what has failed? Temperature circuitry? Why so powerful?

On September 25, 2015 at 1:19am

sunil jaiswal wrote:

is their potential to go for manufacturing in india Li-ion battery in rural area.

On November 5, 2015 at 7:54am

noah lewis wrote:

just make it like a Sandwhich.

On December 8, 2015 at 5:08pm

Zander wrote:

thanks for da infomation

On December 14, 2015 at 10:50am

yuehui zhou wrote:

Where can I find a reference for a typical battery construction with all detailes?

On February 2, 2016 at 12:58am

alfred wrote:

your site is informative

On February 9, 2016 at 6:15am

Youssef wrote:

What should I do when the battery fallout of my phone?

Should I put it back ?

On February 13, 2016 at 7:34pm

Lyndsey Hedges wrote:

If a Li-ion battery has been put on a NiCd charger and run will the battery be any good if put on the correct charger or will it be stuffed.

Thanks

Lyndsey

On February 25, 2016 at 4:14am

Onice Sleeth wrote:

The global lithium production is composed for sustained growth in the years ahead. Polymers followed by li-ion batteries application are expected to be the largest contributor to the future growth in the global lithium market through 2020. Between 2015 and 2020, the overall lithium consumption will likely post 11.93% YoY growth in terms of volume. Chile and Australia are the largest producers of lithium followed by China, Argentina, Zimbabwe and U.S.A among others.

Get PDF - http://www.micromarketmonitor.com/contact/6399359204-download_pdf_brochure.html

On March 14, 2016 at 2:06pm

Christopher wrote:

The comment about a liquid battery. Liquid is heavy, 10+

pounds per gallon, that's why such a push for dry cells, plus the mess of liquid. When you put 10 gallons of gas in your car, you are also adding about 100 lbs. There are cell phones now with a type-c usb rapid charge system, 15 minutes can give up to 10 hours of use. When a car battery system can produce these type of results it will happen, but for now the logistics of an electrical vehicle is far off.

On March 21, 2016 at 7:45pm

William E McNeil wrote:

I have a lithium ion battery pack (18650) five battery's. When placed in my edger or blower these units will run for a short period of time then slow down and stop. If I wait for two minutes the units come on strong and again after a short period of time they slow and stop. Checking the voltage it back at 19 volts is there a problem with the battery breaking down internal then repairing it self or something in the protecting circuit.

On April 11, 2016 at 9:45am

Vladimir Khruvoff wrote:

Yes I need hands on fancy Li battery for personal use against enemies. I hold very low monetary value of US dollar, but no problem because I will pay you back once I cause country to fall. I offer \$34 for battery to allow charger of atom splitter in new device. I willing to negotiate, yes? Please use email if interest is drawn.

On April 17, 2016 at 10:37am

A.Hudson wrote:

I replaced all of my wall clock batteries with AA Li-ion batteries two months ago, but after learning that they have a higher voltage than standard alkaline batteries, I am wondering whether this was a wise choice. The clocks are working fine but is the higher voltage likely to shorten their life?

Also, is it possible to replace garden solar lights with rechargeable Li-ion batteries or will they damage the LEDs?

Grateful for any advice on these.

On April 23, 2016 at 1:19am

oldie wrote:

nice to read those first comments after 6yrs. nice also to notice how li-po's are improved during the time.

On April 27, 2016 at 3:51pm

Christopher wrote:

http://www.gizmag.com/rechargeable-zinc-manganese-battery-pnnl/42930/?utm_source=Gizmag+Subscribers&utm_campaign=f265d36ee8-UA-2235360-4&utm_medium=email&utm_term=0_65b67362bd-f265d36ee8-92374733

On May 27, 2016 at 12:57pm

C. G. Kanz wrote:

Has anyone found another source to purchase replacement Li-Ion batteries for a Inogen One oxygen concentrator or a charger?

Thanks for all help

On June 27, 2016 at 6:49pm

Ron wrote:

Can the same charger be used for a Li-ion and a Li-ion polymer battery?

Thank you

On August 21, 2016 at 7:16pm

Keith wrote:

Could a lith-ion battery be used on solar gokart?

On December 13, 2016 at 1:18pm

mike wrote:

LOOKING TO REPLACE MY BATTERY ON MY E BIKE IT HAS A 48V 8AH I WOULD LIKE IT TO GO A LITTLE BIT FASTER WOULD A 48V12AH DO THAT OR COULD I GO WITH A 52V 17 AH IT HAS A 500WATT MOTOR DOES THE CONTROLER COME INTO PLAY ALSO

On December 28, 2016 at 3:25am

FRANCO wrote:

As lithium batteries lose capacity, performance and get more dangerous under charging condition by the aging, why manufactures do not print the production and the expiry date on them?

On March 7, 2017 at 12:33am

Pooja wrote:

Nice article, Lithium Ion Battery Market worth 68.97 Billion USD by 2022

Download PDF Brochure: <http://cutt.us/5vLn>

The major players involved in the lithium ion battery market are LG Chem Ltd. (South Korea), Panasonic Corporation (Japan), Samsung SDI Co., Ltd. (South Korea), BYD Co. Ltd. (China), BAK Group (China), A123 Systems, LLC. (U.S.), GS Yuasa Corporation (Japan), Hitachi, Ltd. (Japan), Johnson Controls Inc. (U.S.), Saft Groupe S.A. (France), Toshiba Corporation (Japan), and Valence Technology Inc. (U.S.).

On April 13, 2017 at 4:21pm

Michael wrote:

I have a cell phone using a EB-L1D718A 1850 mAh. If I buy a 2200 mAh battery replacement will this effect / hurt the phone. manufactures is offering the higher power battery as an available substitute for the current battery

On December 9, 2018 at 5:48am

Salem wrote:

I would like to manufacture a U shape Lithium Ion Polymer battery. Is that possible or do they only come in rectangular and cylindrical shapes?

On March 29, 2019 at 6:07pm

Justin O'Toole wrote:

I can't understand in this day and age how aaa lithium batteries such Energizer are so weak and not very strong. You would think they could develop a aaa lithium battery 3 times stronger. I am no expert on batteries but with modern science and technologies you would think they could develop a better battery.

A much stronger battery with more power and a longer life. I have found aaa lithium battery's very weak. But this is only my opinion base on what i have found. I was amazed at how weak they were. This is only a personal opinion and i am not an expert in battery's.

On July 2, 2019 at 11:28pm

Euclion energy wrote:

.Lithium ion batteries can deliver more run time per charge
.The highest capacity for lithium-ion batteries is 3.0 Ah
.This represents a 25 percent increase of the NiCad at 2.4 Ah
.lithium-ion battery will deliver better total performance over the life of the battery than NiCad and NIMH

On July 11, 2019 at 9:25am

gerald walz wrote:

Could a Lithium battery be developed for use in a 6 volt automotive system, and what would happen after the vehicle is started and receiving a constant charge from the generator?

On August 9, 2019 at 4:34pm

Anshul wrote:

As a rapper, I think that Lithium ion batteries are a fantastic alternative to fossil fuels and will definitely dominate the energy market by 2050.

On August 22, 2019 at 2:51am

shafiq wrote:

Bateri penuh

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