Battery University

BU-301a: Types of Battery Cells

Compare the pros and cons of the cylindrical cell, button cell, prismatic cell and pouch

As batteries were beginning to be mass-produced, the jar design changed to the cylindrical format. The large F cell for lanterns was introduced in 1896 and the D cell followed in 1898. With the need for smaller cells, the C cell followed in 1900, and the popular AA was introduced in 1907. See BU-301: Standardizing Batteries into Norms.

Cylindrical Cell

The cylindrical cell continues to be one of the most widely used packaging styles for primary and secondary batteries. The advantages are ease of manufacture and good mechanical stability. The tubular cylinder can withstand high internal pressures without deforming.

Many lithium and nickel-based cylindrical cells include a positive thermal coefficient (PTC) switch. When exposed to excessive current, the normally conductive polymer heats up and becomes resistive, stopping current flow and acting as short circuit protection. Once the short is removed, the PTC cools down and returns to the conductive state.

Most cylindrical cells also feature a pressure relief mechanism, and the simplest design utilizes a membrane seal that ruptures under high pressure. Leakage and dry-out may occur after the membrane breaks. Re-sealable vents with a spring-loaded valve are the preferred design. Some consumer Li-ion cells include the Charge Interrupt Device (CID) that physically and irreversibly disconnect the cell when activated to an unsafe pressure builds up. Figure 1 shows a cross section of a cylindrical cell.

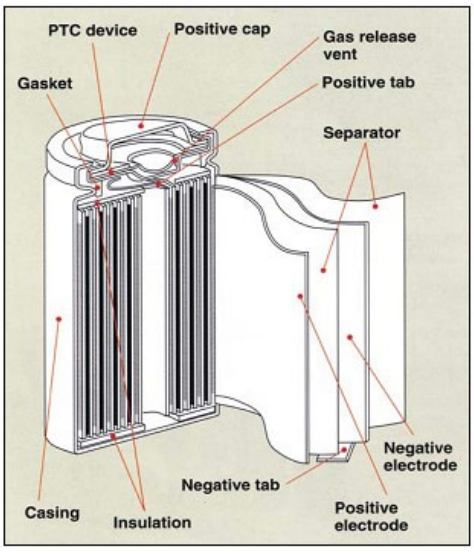

Figure 1: Cross section of a lithium-ion cylindrical cell.
The cylindrical cell design has good cycling ability, offers a long calendar life and is economical, but is heavy and has low packaging density due to space cavities.

Source: Sanyo

Typical applications for the cylindrical cell are power tools, medical instruments, laptops and e-bikes. To allow variations within a given size, manufacturers use partial cell lengths, such as half and three-quarter formats, and nickel-cadmium provides the largest variety of cell choices. Some spilled over to nickel-metal-hydride, but not to lithium-ion as this chemistry established its own formats. The 18650 illustrated in Figure 2 remains one of the most popular cell packages. Typical applications for the 18650 Li-ion are power tools, medical devices, laptops and e-bikes.

Figure 2: Popular 18650 lithium-ion cell.
The metallic cylinder measure 18mm in diameter and 65mm the length. The larger 26650 cell measures 26mm in diameter.

Courtesy of Cadex

In 2013, 2.55 billion 18650 cells were produced. Early Energy Cells had 2.2Ah; this was replaced with the 2.8Ah cell. The new cells are now 3.1Ah with an increase to 3.4Ah by 2017. Cell manufacturers are preparing for the 3.9Ah 18650.

The 18650 could well be the most optimized cell; it offers one of the lowest costs per Wh and has good reliability records. As consumers move to the flat designs in smart phones and tablets, the demand for the 18650 is fading and Figure 3 shows the over-supply that is being corrected thanks to the demand of the Tesla electric vehicles that also uses this cell format for now. As of end of 2016, the battery industry fears battery shortages to meet the growing demand for electric vehicles.

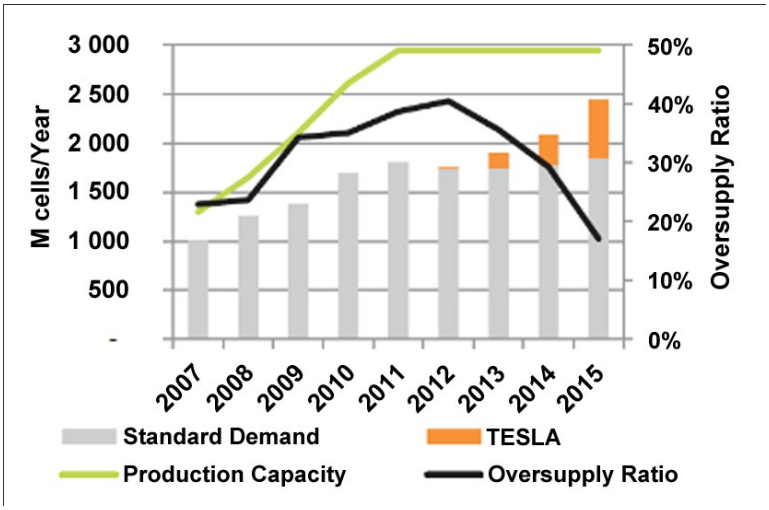

Figure 3: Demand and supply of the 18650.
The demand for the 18650 would have peaked in 2011 had it not been for new demands in military, medical and drones, including the Tesla electric car. The switch to a flat-design in consumer products and larger format for the electric powertrain will eventually saturate the 18650. A new entry is the 21700.

Source: Avicenne Energy

There are other cylindrical Li-ion formats with dimensions of 20700, 21700 and 22700. Meanwhile, Tesla, Panasonic and Samsung have decided on the 21700 for easy of manufacturing, optimal capacity and other benefits. While the 18650 has a volume of 66cm^3 with a capacity of around 3000mAh, the 97cm^3 volume of the 21700 is said to produce a capacity of up to 6000mAh, essentially doubling the capacity with a 50% increase in volume. Tesla Motor refers to their company's new 21700 as the "highest energy density cell that is also the cheapest." (The 2170 nomenclature Tesla advocates is not totally correct; the last zero of the 21700 model describes a cylindrical cell harmonizing with the IEC standard.)

The larger 26650 cell with a diameter of 26mm does not enjoy the same popularity as the 18650. The 26650 is commonly used in load-leveling systems. A thicker cell is said to be harder to build than a thinner one. Making the cell longer is preferred. There is also a 26700 made by E-One Moli Energy.

Some lead acid systems also borrow the cylindrical design. Known as the Hawker Cyclone, this cell offers improved cell stability, higher discharge currents and better temperature stability compared to the conventional prismatic design. The Hawker Cyclone has its own format.

Even though the cylindrical cell does not fully utilize the space by creating air cavities on side-by-side placement, the 18650 has a higher energy density than a prismatic/pouch Li-ion cell. The 3Ah 18650 delivers 248Ah/kg, whereas a modern pouch cell has about 140Ah/kg. The higher energy density of the cylindrical cell compensates for its less ideal stacking abilities and the empty space can always be used for cooling to improve thermal management.

Cell disintegration cannot always be prevented but propagation can. Cylindrical cells are often spaced apart to stop propagation should one cell take off. Spacing also

helps in the thermal management. In addition, a cylindrical design does not change size. In comparison, a 5mm prismatic cell can expand to 8mm with use and allowances must be made.

Button Cell

The button cell, also known as coin cell, enabled compact design in portable devices of the 1980s. Higher voltages were achieved by stacking the cells into a tube. Cordless telephones, medical devices and security wands at airports used these batteries.

Although small and inexpensive to build, the stacked button cell fell out of favor and gave way to more conventional battery formats. A drawback of the button cell is swelling if charged too rapidly. Button cells have no safety vent and can only be charged at a 10- to 16-hour charge; however, newer designs claim rapid charge capability.

Most button cells in use today are non-rechargeable and are found in medical implants, watches, hearing aids, car keys and memory backup. Figure 4 illustrates the button cells with a cross section.

CAUTION	Keep button cells to out of reach of children. Swallowing a cell can cause serious health problems. See BU-703 Health Concerns with Batteries.

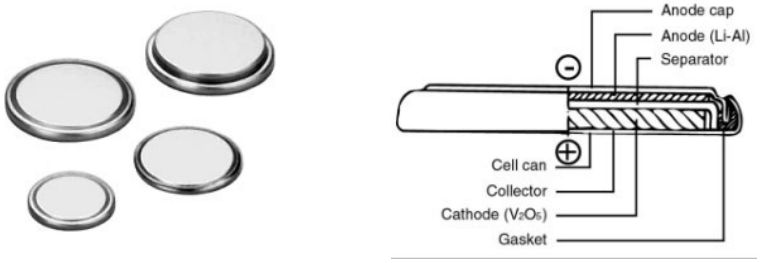

Figure 4: Button cells provides small size, most are primary for single-cell use.

Source: Sanyo and Panasonic

Prismatic Cell

Introduced in the early 1990s, the modern prismatic cell satisfies the demand for thinner sizes. Wrapped in elegant packages resembling a box of chewing gum or a small chocolate bar, prismatic cells make optimal use of space by using the layered approach. Other designs are wound and flattened into a pseudo-prismatic jelly roll. These cells are predominantly found in mobile phones, tablets and low-profile laptops ranging from 800mAh to 4,000mAh. No universal format exists and each manufacturer designs its own.

Prismatic cells are also available in large formats. Packaged in welded aluminum housings, the cells deliver capacities of 20–50Ah and are primarily used for electric powertrains in hybrid and electric vehicles. Figure 5 shows the prismatic cell.

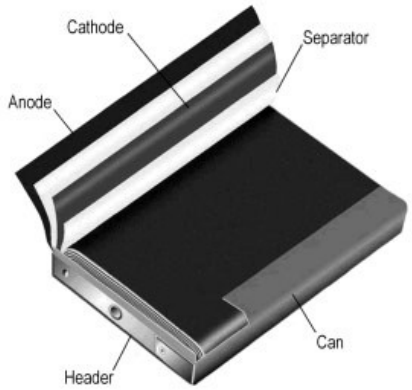

Figure 5: Cross section of a prismatic cell.
The prismatic cell improves space utilization and allows flexible design but it can be more expensive to manufacture, less efficient in thermal management and have a shorter cycle life than the cylindrical design. Allow for some swelling.

Source: Polystor Energy Corporation

The prismatic cell requires a firm enclosure to achieve compression. Some swelling due to gas buildup is normal, and growth allowance must be made; a 5mm (0.2") cell can grow to 8mm (0.3") after 500 cycles. Discontinue using the battery if the distortion presses against the battery compartment. Bulging batteries can damage equipment and compromise safety.

Pouch Cell

In 1995, the pouch cell surprised the battery world with a radical new design. Rather than using a metallic cylinder and glass-to-metal electrical feed-through, conductive foil-tabs were welded to the electrodes and brought to the outside in a fully sealed way. Figure 6 illustrates a pouch cell.

Figure 6: The pouch cell.
The pouch cell offers a simple, flexible and lightweight solution to battery design. Some stack pressure is recommended but allowance for swelling must be made. The pouch cells can deliver high load currents but it performs best under light loading conditions and with moderate charging.

Source: A123

The pouch cell makes most efficient use of space and achieves 90–95 percent packaging efficiency, the highest among battery packs. Eliminating the metal enclosure reduces weight, but the cell needs support and allowance to expand in the battery compartment. The pouch packs are used in consumer, military and automotive applications. No standardized pouch cells exist; each manufacturer designs its own.

Pouch packs are commonly Li-polymer. Small cells are popular for portable applications requiring high load currents, such as drones and hobby gadgets. The larger cells in the 40Ah range serve in energy storage systems (ESS) because fewer cells simplify the battery design.

Although easily stackable, provision must be made for swelling. While smaller pouch packs can grow 8–10 percent over 500 cycles, large cells may expand to that size in 5,000 cycles. It is best not to stack pouch cells on top of each other but to lay them flat, side by side or allow extra space in between them. Avoid sharp edges that can stress the pouch cells as they expand.

Extreme swelling is a concern. Users of pouch packs have reported up to 3 percent swelling incidents on a poor batch run. The pressure created can crack the battery cover, and in some cases, break the display and electronic circuit boards. Discontinue using an inflated battery and do not puncture the bloating cell in close proximity to heat or fire. The escaping gases can ignite. Figure 7 shows a swollen pouch cell.

Figure 7: Swollen pouch cell.
Swelling can occur due to gassing. Improvements are being made with newer designs. Large pouch cells designs experience less swelling. The gases contain mainly CO_2 (carbon dioxide) and CO (carbon monoxide).

Courtesy of Cadex

Pouch cells are manufactured by adding a temporary “gasbag” on the side. Gases escape into the gasbag while forming the solid electrolyte interface (SEI) during the first charge. The gasbag is cut off and the pack is resealed as part of the finishing process. Forming a solid SEI is key to good formatting practices. Subsequent charges should produce minimal gases, however, gas generation, also known as gassing, cannot be fully avoided. It is caused by electrolyte decomposition as part of usage and aging. Stresses, such as overcharging and overheating promote gassing. Ballooning with normal use often hints to a flawed batch.

The technology has matured and prismatic and pouch cells have the potential for greater capacity than the cylindrical format. Large flat packs serve electric powertrains and Energy Storage System (ESS) with good results. The cost per kWh in the prismatic/pouch cell is still higher than with the 18650 cell but this is changing. Figure 8 compares the price of the cylindrical, prismatic and pouch cells, also known as laminated. Flat-cell designs are getting price competitive and battery experts predict a shift towards these cell formats, especially if the same performance criteria of the cylindrical cell can be met.

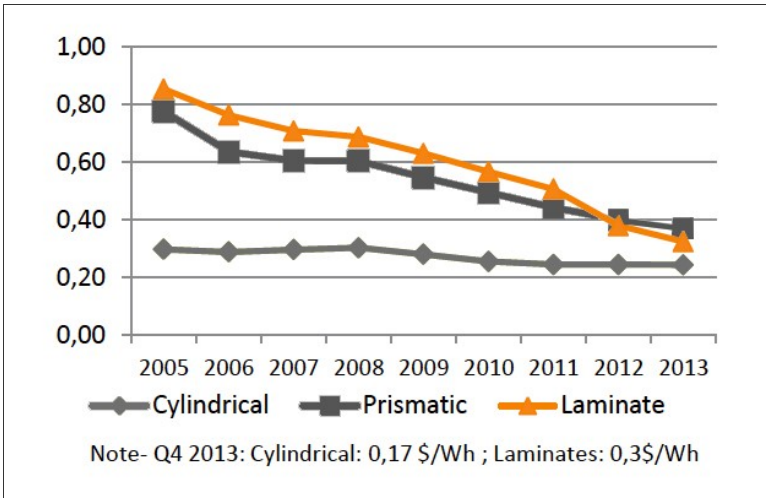

Figure 8: Price of Li-ion ($US/Wh).
Historically, manufacturing costs of prismatic and pouch formats (laminate) were higher, but they are converging with cellular design. Pricing involves the manufacturing of the bare cells only.

Source: Avicenne Energy

Summary

With the pouch cell, the manufacturer is attempting to simplify cell manufacturing by replicating the packaging of food. Each format has pros and cons as summarized below.

- **Cylindrical cell** has high specific energy, good mechanical stability and lends itself to automated manufacturing. Cell design allows added safety features that are not possible with other formats (see BU-304b: Making Lithium-ion Safe); it cycles well, offers a long calendar life and is low cost, but it has less than ideal packaging density. The cylindrical cell is commonly used for portable applications.
- **Prismatic cell** are encased in aluminum or steel for stability. Jelly-rolled or stacked, the cell is space-efficient but can be costlier to manufacture than the cylindrical cell. Modern prismatic cells are used in the electric powertrain and energy storage systems.
- **Pouch cell** uses laminated architecture in a bag. It is light and cost-effective but exposure to humidity and high temperature can shorten life. Adding a light stack pressure prolongs longevity by preventing delamination. Swelling of 8–10 percent over 500 cycles must be considered with some cell designs. Large cells work best with light loading and moderate charge times. The pouch cell is growing in popularity and serves similar applications to the prismatic cell.

Last Updated 2017-07-31

*** Please Read Regarding Comments ***

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.

Or Jump To A Different Article

Basics You Should Know

Introduction

- BU-001: Sharing Battery Knowledge
- BU-002: Introduction
- BU-003: Dedication

Crash Course on Batteries

- BU-101: When Was the Battery Invented?
- BU-102: Early Innovators
- BU-103: Global Battery Markets
- BU-103a: Battery Breakthroughs: Myth or Fact?
- BU-104: Getting to Know the Battery
- BU-104a: Comparing the Battery with Other Power Sources

- BU-104b: Battery Building Blocks
- BU-104c: The Octagon Battery – What makes a Battery a Battery
- BU-105: Battery Definitions and what they mean
- BU-106: Advantages of Primary Batteries
- BU-106a: Choices of Primary Batteries
- BU-107: Comparison Table of Secondary Batteries

Battery Types

- BU-201: How does the Lead Acid Battery Work?
- BU-201a: Absorbent Glass Mat (AGM)
- BU-201b: Gel Lead Acid Battery
- BU-202: New Lead Acid Systems
- BU-203: Nickel-based Batteries
- BU-204: How do Lithium Batteries Work?
- BU-205: Types of Lithium-ion
- BU-206: Lithium-polymer: Substance or Hype?
- BU-208: Cycling Performance
- BU-209: How does a Supercapacitor Work?
- BU-210: How does the Fuel Cell Work?
- BU-210a: Why does Sodium-sulfur need to be heated
- BU-210b: How does the Flow Battery Work?
- BU-211: Alternate Battery Systems
- BU-212: Future Batteries
- BU-213: Cycle Performance of NiCd, NiMH and Li-ion
- BU-214: Summary Table of Lead-based Batteries
- BU-215: Summary Table of Nickel-based Batteries
- BU-216: Summary Table of Lithium-based Batteries
- BU-217: Summary Table of Alternate Batteries
- BU-218: Summary Table of Future Batteries

Packaging and Safety

- BU-301: A look at Old and New Battery Packaging
- BU-301a: Types of Battery Cells
- BU-302: Series and Parallel Battery Configurations
- BU-303: Confusion with Voltages
- BU-304: Why are Protection Circuits Needed?
- BU-304a: Safety Concerns with Li-ion
- BU-304b: Making Lithium-ion Safe
- BU-304c: Battery Safety in Public
- BU-305: Building a Lithium-ion Pack
- BU-306: What is the Function of the Separator?
- BU-307: How does Electrolyte Work?
- BU-308: Availability of Lithium
- BU-309: How does Graphite Work in Li-ion?
- BU-310: How does Cobalt Work in Li-ion?
- BU-311: Battery Raw Materials

Charge Methods

- BU-401: How do Battery Chargers Work?
- BU-401a: Fast and Ultra-fast Chargers
- BU-402: What Is C-rate?
- BU-403: Charging Lead Acid
- BU-404: What is Equalizing Charge?
- BU-405: Charging with a Power Supply
- BU-406: Battery as a Buffer
- BU-407: Charging Nickel-cadmium
- BU-408: Charging Nickel-metal-hydride
- BU-409: Charging Lithium-ion
- BU-409a: Why do Old Li-ion Batteries Take Long to Charge?
- BU-410: Charging at High and Low Temperatures
- BU-411: Charging from a USB Port
- BU-412: Charging without Wires
- BU-413: Charging with Solar, Turbine
- BU-413a: How to Store Renewable Energy in a Battery
- BU-414: How do Charger Chips Work?
- BU-415: How to Charge and When to Charge?

Discharge Methods

- BU-501: Basics about Discharging
- BU-501a: Discharge Characteristics of Li-ion
- BU-502: Discharging at High and Low Temperatures
- BU-503: How to Calculate Battery Runtime

Batteries as Power Source

Amazing Value of a Battery

- BU-1001: Batteries in Industries
- BU-1002: Electric Powertrain, then and now
- BU-1002a: Hybrid Electric Vehicles and the Battery
- BU-1003: Electric Vehicle (EV)
- BU-1004: Charging an Electric Vehicle
- BU-1005: Does the Fuel Cell-powered Vehicle have a Future?
- BU-1006: Cost of Mobile and Renewable Power
- BU-1007: Net Calorific Value
- BU-1008: Working towards Sustainability
- BU-1009: Battery Paradox - Afterword

Information

- BU-1101: Glossary
- BU-1102: Abbreviations
- BU-1103: Bibliography
- BU-1104: About the Author
- BU-1105: About Cadex
- BU-1403: Author's Creed

Learning Tools

- BU-1501 Battery History
- BU-1502 Basics about Batteries
- BU-1503 How to Maintain Batteries
- BU-1504 Battery Test & Analyzing Devices
- BU-1505 Short History of Cadex

Battery Pool

- Predictive Test Methods for Starter Batteries
- Why Mobile Phone Batteries do not last as long as an EV Battery
- Battery Rapid-test Methods
- How to Charge Li-ion with a Parasitic Load
- Ultra-fast Charging
- Assuring Safety of Lithium-ion in the Workforce
- Diagnostic Battery Management
- Tweaking the Mobile Phone Battery
- Battery Test Methods
- Battery Testing and Safety
- How to Make Battery Performance Transparent
- Battery Diagnostics On-the-fly
- Making Battery State-of-health Transparent
- Batteries will eventually die, but when and how?
- Why does Pokémon Go rob so much Battery Power?
- How to Care for the Battery
- How to Rate Battery Runtime
- Tesla's iPhone Moment — How the Powerwall will Change Global Energy Use
- Painting the Battery Green by giving it a Second Life
- Charging without Wires — A Solution or Laziness
- What everyone should know about Battery Chargers
- A Look at Cell Formats and how to Build a good Battery
- Battery Breakthroughs — Myth or Fact?
- Rapid-test Methods that No Longer Work
- Shipping Lithium-based Batteries by Air
- How to make Batteries more Reliable and Longer Lasting
- What causes Lithium-ion to die?
- Safety of Lithium-ion Batteries
- Recognizing Battery Capacity as the Missing Link
- Managing Batteries for Warehouse Logistics
- Caring for your Starter Battery
- Giving Batteries a Second Life
- How to Make Batteries in Medical Devices More Reliable
- Possible Solutions for the Battery Problem on the Boeing 787
- Impedance Spectroscopy Checks Battery Capacity in 15 Seconds
- How to Improve the Battery Fuel Gauge
- Examining Loading Characteristics on Primary and Secondary Batteries

Language Pool

- BU-001: Compartir conocimiento sobre baterías
- BU-002: Introducción
- BU-003: Dedicatoria
- BU-104: Conociendo la Batería

- BU-302: Configuraciones de Baterías en Serie y Paralelo

Batteries in a Portable World

- Change-log of "Batteries in a Portable World," 4th edition: Chapters 1 - 3
- Change-log of "Batteries in a Portable World," 4th edition: Chapters 4 - 10
- Close Part Three Menu

Comments

On May 1, 2011 at 11:30am

Steve Arey wrote:

Can the prismatic pouch pack be recycled?
Do you sell these?
Thanks,

On September 26, 2011 at 9:35am

Bill wrote:

Do you know 2-3 most common pouch cell material suppliers?

On November 14, 2011 at 12:20pm

Frank John wrote:

Dear Sales,
We come across your email and we want to know if you can supply
us these items 12Volt 100Ah to 200Ah Sealed lead battery Battery
Specifications * Voltage: 12 Volt * Capacity Ampere Hours:100 (@20hr rate) *
Dimensions (L x W x H): 12.01" X 6.60" X 9.25" or more * Weight: 65 pounds
or more * 12 months of complete warranty and 48 months of pro-rated warranty
* Non Hazardous battery.

Let us know if you can supply us within 5 business day for delivery.
And more also specify the type Credit cards you will be needed for the
payment .

Your response is most important to us.

Thank you.

Frank John
0943 W. Tennessee Street
Tallahassee,Florida 5530

On November 22, 2011 at 6:43am

tonyzhou wrote:

Dear friends,

I owe your name to network resourse,from which we learnt that you might need battery and charger.
this is Tony from WaMa battery,our company manufacture battery (full capacity) and charger for 10 years.
wish to be able to service you

NI-MH battery
CR123A RCR123A
18650 battery series
Li-ion button cell
Button battery(AG,CR,SR)
Prismatic&Polymer; Batteries
Alkaline battery(23A,27A,4LR44)
Solar mobile phone charger
Wind power mobile phone charger
Portable power mobile phone charger

Your OEM and ODM are available
the products have passed ISO, UL,SGS,CE,ROHS certification
Thank you &king; regards
Email: zrqtmds@yahoo.com

Skype: zrqtmds
Tony
www.wamabattery.com
www.globalsources.com/wamabattery.co

On December 20, 2011 at 10:36am

Donald Nelson wrote:

Good Day Sir/Ma…..Please i will like to know if you have 100 or 200Ah Sealed lead battery 12 Volt….Non Hazardous battery.

If so…Kindly Quote me the Price per battery

Donald Nelson
Donald Enterprise
3117 West-Side Dr
Durant Oklahoma
74701 USA

On February 2, 2012 at 12:17pm

Ming Lai wrote:

I have a dead NiCad battery pack of 6.2 volt, one of the cell is only showing 43mV while the other four shows 1.2 volt. it measures ~1.325"x0.9" for each cell. Would some body kindly tell me what size of NiCad battery that is? So that I can order a replacement pack??
Thanks. (Please send me email on this, thanks)

On March 15, 2012 at 12:42am

peter wrote:

Dear Sir,
Good day!
This is Peter from Changzhou Yufeng Electrical Co., Ltd which specialized in producing 3V lithium button-cell.

As to our company ,a brief introduction for your check.
1. Professional Li-MnO2 button cell battery manufacturer since 2000 in China.
2. With over 30 million batteries produced per month and 18 most advanced production lines here, we have taken up 1/3 of the domestic market.
3.We have more than 8 years experience serving abroad customers in North America and Europe.
4.We have got Certificate of RoHS,UL,UN 38.3 for our products.

I enclosed our products spec,pls check it.
For more information,pls contact me directly.
Looking forward to your feedback.

Best regards
Peter
Changzhou Yu Feng Electrical Co.,Ltd.
www.henlimax.com
Email:peter@czyufeng.com
Zhuxiashu Industrial Park, Xilin, Zhonglou District, Changzhou, Jiangsu,China
Tel: 0086-519-85019892/85019872
Fax: 0086-519-85019899

On June 6, 2012 at 6:16pm

sunnyzeng wrote:

by the way, our company website is
www.gybattery.com

On January 7, 2014 at 10:28am

Sagar Ganu wrote:

Please let know the standard formula used to calculate 9AH battery's charging time.

On February 27, 2014 at 4:09am

harry potter wrote:

do you use skype? If yes we can also discuss there. - It would be awsome if a discussion of e.g. batteries could be done between different scientist via skype or something else, so that everyone get soon help…

i just want to ask something about that battery and explain me how to make it in russia\
benelmokadem
harry potter movies in order

On February 27, 2014 at 4:10am

harry potter wrote:

do you use skype? If yes we can also discuss there. - It would be awsome if a discussion of e.g. batteries could be done between different scientist via skype or something else, so that everyone get soon help…
i just want to ask something about that battery and explain me how to make it in russia\
benelmokadem
harry potter movies in order
thank you

On September 9, 2014 at 11:56pm

Mir wrote:

Sir
I am in need of battery with following specifications. If you can help me, i will be very much obliged.
1. 28v output voltage
2. minimum 6ah capacity
3. must be parallel/series combination of li-ion cells
4. weight<1000g
5. rechargeable
6. lifetime > 1.5 year
waiting for your reply !
thankyou!

On November 6, 2014 at 7:52am

Hassan Shabbir wrote:

Dear,
I am Hassan Shabbir a Sales Engineer in a Germany. I am working for a company that develops, manufactures and sells Lithium ion batteries and Fuel cells. Our company offers the client specifically adapted solutions for the electricity supply of his products.
If someone interested than kindly contact me on my given address. I shall be very thankfull to you.

Best Regards:
Hassan Shabbir
Sales Engineer
BE-POWER GmbH, Germany
Email:hshabbir@be-power.de
Phone: +49 (0) 64 04 -2 05 15-23

On December 5, 2014 at 3:21pm

David R wrote:

Dear Mir,
GlobTek is a world class manufacturer of Li-Ion battery packs and chargers, including a large range of IEC62133, UL 1642 and 2054 certified solutions. We Manufacture battery packs for Medical, Telecom, and mobile device applications for worldwide Fortune 500 companies as well as small manufacturers. Please contact one of our offices nearest to your location. Our website is www.globtek.com

Thanks!

On January 17, 2015 at 5:45am

M.Mariasudagar wrote:

i like to know about batteries, because i do simulation work in ECE/POWER ELECTRONICS. Anybody provide a corresponding job for a nominal payment.

On March 31, 2015 at 8:31pm

waheed wrote:

we are lithium Manufacturer Please let me know if you need any type of lithium battery
www.yjbattery.com
skype- waheed.z
waheed@yjbattery.com

On April 8, 2015 at 11:22pm

Robert Selph wrote:

Your estimate for Tesla's price/kwh is way too high. Tesla's price (at the cell level) is under $200/kwh, and probably more like $150 - $200/kwh. Here's a report from Advanced Automotive batteries that estimates their cost at the cell level to be $180/kwh:

https://www.advancedautobat.com/industry-reports/2014-Tesla-report/Extract-from-the-Tesla-battery-report.pdf

Here's an article from SAE International that estimates Tesla's cost at under $160/kwh:

http://articles.sae.org/12833/

Here's an article referencing an analyst at IEK who was saying 18650 costs were $120 - $200/kwh back in 2012:

http://news.cens.com/cens/html/en/news/news_inner_42230.html

In 2013, Tesla's CTO J.B. Straubel said that the battery pack in the Tesla makes up "less than a quarter" of the cost of the car in most cases. Here's a good article from InsideEVs that estimates that the cost at the pack level is $238/kwh. The Advanced Automotive Batteries report puts the cost at the cell level at 71% of the cost at the pack level (look at slide 28 in the report). 238 x 0.71 = $169/kwh.

Here's the article from InsideEVs:

http://insideevs.com/tesla-battery-in-the-model-s-costs-less-than-a-quarter-of-the-car-in-most-cases/

And that's CURRENT prices. The Gigafactory is going to decrease cost at the cell level by at least 30%, which means that the Gen III battery will cost $105 - $140/kwh.

Ask Greenwich strategy how they arrived at that estimate. Becauase it looks like they just took the price difference between the 60kwh Tesla and the 85kwh ($10,000 or $400/kwh) and reduced it by 30% to account for the Gigafactory. I hope you're not paying them for these estimates.

On April 29, 2015 at 3:46pm

Andrew Input wrote:

What a great article, I wish i had this information sooner.

It is a time of scarce resources and environmental crisis, we should not be wasting Lithium batteries by parking them needlessly at 100% charge. Even if convenience is someones only concern - it is inconvenient to have a weak battery when you need it, and an inconvenience replacing it even if the price is trivial, and to most people it ain't that is a fact!

Better production standards should require that li-on charging schemes make the best use of our batteries. Phones and laptops can observe how a device is being used and set the top charge level more intelligently.

The data indicates li-on batteries will depreciate half as quickly when kept at 85% charge instead of the 100% standard. That is a huge saving already.

I found a key on my laptop which I hadn't noticed before which stops it charging despite being plugged in. Now i am aware of this articles information, i will let it sit at lower charge rates, except when I might be able to use its full 7 hour capacity.

On May 3, 2015 at 8:59pm

Elphus Masete wrote:

WE ARE IN THE PROCESS OF MANUFACTURING OUR OWN LEAD ACID BATTERIES, WE WOULD LIKE TO BRING YOU ONBOARD TO HELP US WITH THE DESIGN SERVICES.

On May 4, 2015 at 3:15am

Amin Saleem wrote:

Hello everyone

I wonder if someone can tell me where can i buy LR416 sized cell cases. Thanks in advance.

Regards,
Amin

On June 10, 2015 at 2:22am

Soren wrote:

Hi All,

Does anyone know the name of the manufacture of a new type of rechargable battery.
It´s a coin cell battery which is rechargeable but the special thing about it is it´s properties, as it discharges from approx 3.7V to 1.6V and acts differently at 1.6V.
To my knowledge there is only one supplier producing this type of battery, but I forgot which ?.

Hope someone can help.

Thanks in advance
Br Soren

On July 6, 2015 at 5:45am

Scott wrote:

Soren,

could you be referring to the coin power cells from Varta Microbattery?

Rechargeable Lithium coin with patented technology.

http://www.varta-microbattery.com/en/products/batteries-cells-configurations/technology/rechargeable/lithium-button-cells/all/technology-description.html

---

On August 27, 2015 at 6:01am

Paul Stubbs wrote:

Great website and I have learned a lot.

I use Lipo and Nimh' s in RC flying and RC sailing and get nothing like 500 cycles from either.

After a fairly short time both seem to charge OK and seem to achieve 95-98 capacity but are not able to produce the power (voltage or current) similar to newer cells.

Is this due to build up of internal resistance and is this a product of incorrect charging or too rapid discharging..

I use an Imax Lipoly generic type charger set to Lipo or Nimh and always balance charge Lipo's at around 1C.

Batteries are really cheap now and so I just buy new but it would be nice to know what I can do to make them last longer.

On May 26, 2016 at 1:31pm

Josh wrote:

How much voltage does each laptop battery cell give,

And how much current does it give, consider like acer laptop

Uganda, kampala

On June 3, 2016 at 1:03am

omarion billy wrote:

i would like to have more information about cells and manufacturing process because am in the process of making a device which needs allot of power and my electricity supply is unreliable so its about storage and long lasting is there such a battery

---

On October 4, 2016 at 11:48pm

Stephan wrote:

in the article 'BU-301a: Types of Battery Cells' the authour said this:"the 18650 has a higher energy density than a prismatic/pouch Li-ion cell. The 3Ah 18650 delivers 248Wh/kg, whereas a modern pouch cell has about 140Ah/kg"

This might be a typo as the energy density is measured in 2 units in the quote.Wh/kg and Ah/kg
Which unit is being the correct one?

Please notify/reply as soon as possible

On March 3, 2017 at 8:05am

Bruce Trotter wrote:

The article states the new 2170(0) batteries will have "up to 6000 mAh".
That is an astounding number.
What is the source or reference for that number ?

On April 25, 2017 at 9:36pm

Alifah fajri wrote:

Hi Trotter,

There has been a steady improvement of 10-11Wh/kg in battery cell energy density every year since 1992, the expect innovation to continue at this historical rate — hitting up to 400Wh/kg by 2025. You can see this in many report.
In 2013 I bought 26650 with 2500 mAh, today I can have 18650 with 2500 mAh.
So I think it might be possible to make 2170 batteries with 6000 mAh capacity.

On November 8, 2017 at 5:51am

dharmveer wrote:

PLZ share pouch cell spcs

On March 23, 2018 at 7:48pm

Gabriel wrote:

Hi guys. I am trying to find a supplier for a LiFePO pouch cells 25ahto do my own battery pack but I do not know the way to join one each other. Can you tell me how to do it? Thanks everybody. Gabriel.

On April 6, 2018 at 6:47am

Paul Stubbs wrote:

I have a query with Nimh batteries that I use for RC sailing and flying. I never seem to get many uses out of them (less than 50) before they just won't charge at anything more than 0.1A using my LiPro charger. If I charge them at any higher the charger ends early and either a 2200 mAh AA(9.6V or 6.0V) or 850 mAh (6.0V) will only take around 80mA and charge for barely 3 minutes before tripping full. Why do you think this is? I understand from reading the above that if the current is low the delta peak is not clear and so at low charge rates they never stop but can't understand why they won't take a higher charge rate. Batteries usually only last me around 2-3 years charging them maybe 10-15 times a year max and storing them fully charged.

On April 16, 2018 at 12:10am

Asuquo Eyo wrote:

Good morning, please how can one have cylindrical cell for replacement

On May 18, 2018 at 6:13pm

Abdulhafiz wrote:

I have the information..

On September 14, 2018 at 7:49am

Jessica Ortiz wrote:

I would like to know the characteristics of the materials that are used to pack pouch cells (the polymeric film), especially for the sensitivity to air that electrolytes have.