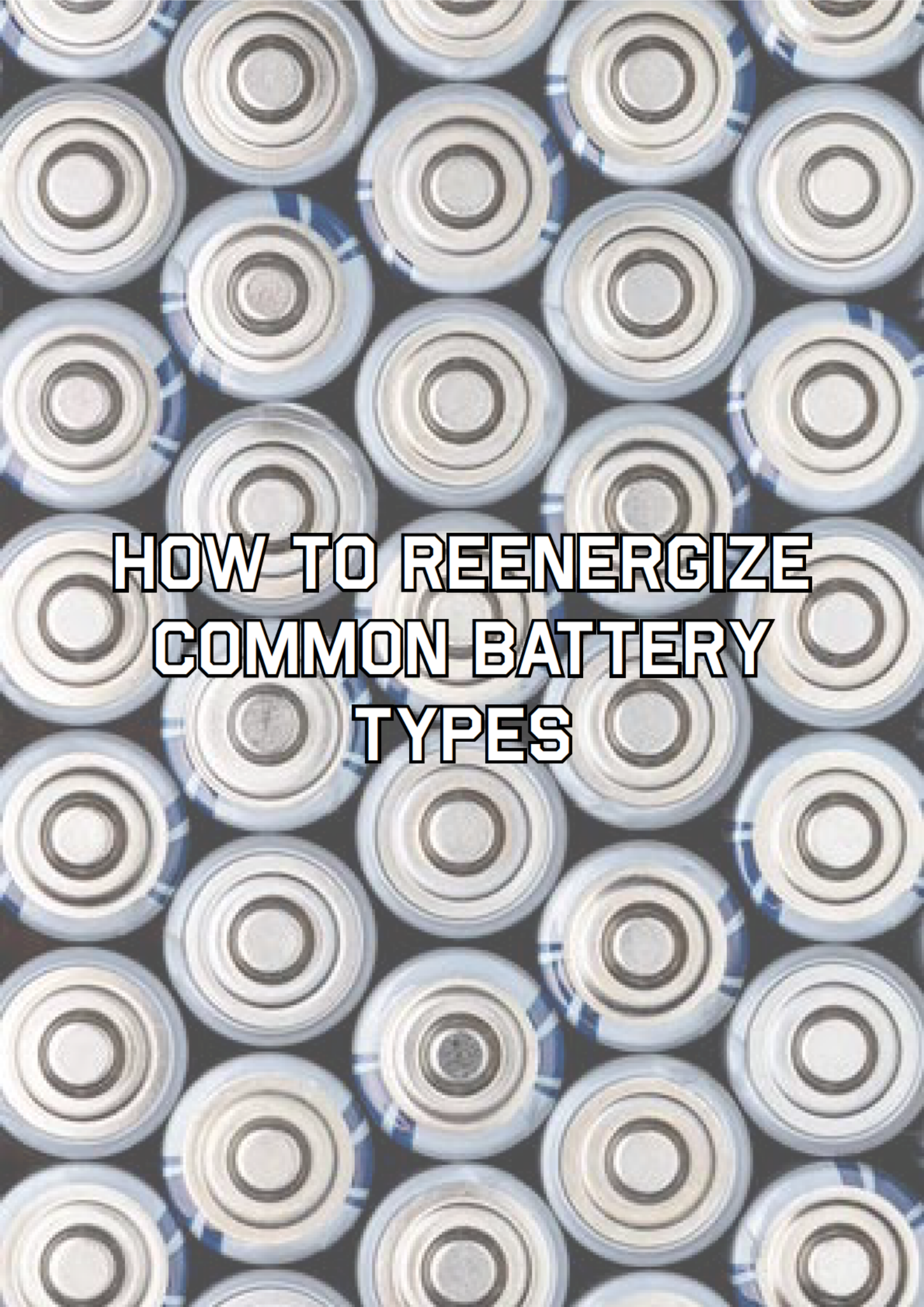


The background of the entire image is a dense, repeating pattern of AA batteries. The batteries are shown from a top-down perspective, with their circular tops and blue and silver-colored casings. They are arranged in a slightly offset grid, creating a textured, circular pattern across the entire frame.

HOW TO REENERGIZE COMMON BATTERY TYPES

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INTRODUCTION

Rechargeable batteries have become a common occurrence these days as almost every type of electronic device comes with one. While these batteries might be perfect for portable technological devices, they are often susceptible to poor use practices and therefore require the proper maintenance approaches. There are various factors to consider for recharging or reconditioning your batteries to achieve the optimal capacity levels.

The following guide contains the key information required for making your batteries last their longest. Specifically, you will learn about working with alkaline, laptop and cell phone batteries. But let's think about the cycle of charging first.

When your first purchase your tech device, you are recommended to plug it into the power source to charge fully before



using the unit. Following this, you can then use the device for a while until it requires recharging. This procedure goes on for a significant duration of time and similar to almost every electronic tool, the rechargeable batteries might wear out after a while and might, therefore, need replacement.

Depending on your frequency level of use and the brand of the



tool, your battery might at some point require regular charging to achieve optimal capacity. This could potentially entail instances where the battery won't charge all the way or take forever to actually charge up.

By using the correct reconditioning procedures, you can easily

rejuvenate the life of your battery and achieve optimal power capacity. The decreasing time in between your charging time is what is commonly referred to as the memory effect.

Every kind of battery is susceptible to the effects of such adversity. One common practice when using these types of batteries is to ensure that the device discharges nearly completely and then recharge it to full capacity again. If you are a frequent user, you might consider using the battery until half empty and recharging it again. The battery will get used to this form of charging and this will help to mitigate the effects of discharging.

It is important to note that the main cause of the memory effects in most batteries is the accumulation of crystals inside the battery. Having said that, these effects can be easily reversed, controlled and the capacity of the battery restored. Another important factor to consider when using your batteries is that you have to employ preventive measures to achieve the best possible results for your unique needs.

As you will see throughout the guide, there are many types of batteries that can be restored. As we start, let's look at the three types of batteries that you will be working with the most.

CHAPTER 1 – UNDERSTANDING THE THREE KEY TYPES OF BATTERIES

CELL PHONE BATTERIES

In 2013, the Pew Research Center's Internet & American Life Project, which was conducted in April and May of 2013 among 2,252 adults, found that cell phones were being used by 91% of all adults. That high percentage is highly believable, even if there was not a survey to prove it. Everywhere you go, people have their cell phones out and are using them. People have become very dependent on their mobile phones and rely on them for everything from talking on the phone to surfing the internet, texting, watching movies and sports, staying caught up with in-the-moment news, and doing business. When one



loses their phone or the battery goes dead people feel isolated and out of touch. They feel disconnected and as though they cannot continue on with their day as usual. The cell phone and the battery that powers it is very important!

A cell phone battery will power your handheld mobile device. Cell phone batteries are charged by being plugged into a power source such as an electrical outlet, power bank or a car power source among other places like what an old cigarette lighter would have looked like. In most cases, a new cell phone battery is supposed to be charged to full capacity to ensure that all cells are well activated.

Most contemporary cell phone batteries are made using lithium ion materials. The added benefit is that these batteries are durable especially when used in the correct manner.

Cell phone batteries are not supposed to be placed in direct sunlight or places with excessive heat since this can compromise their overall functionality. Lithium ion batteries should be charged for an average of 12 hours before use.

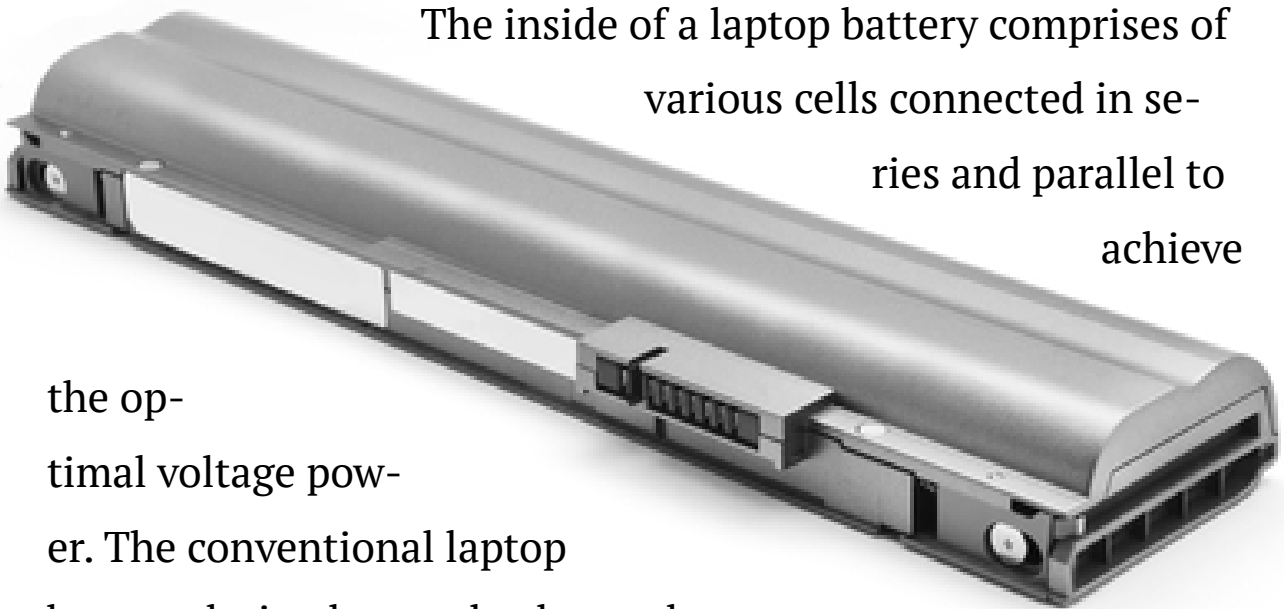
LAPTOP BATTERIES

Laptop batteries are the batteries used to power up portable PCs. These batteries often have a higher power rating than the conventional batteries that you see such as cell phone batteries or even alkaline batteries. Depending on the hardware and software specifications of your device, these tools can guarantee well over 5 hours of power.

The inside of a laptop battery comprises of various cells connected in series and parallel to achieve

the optimal voltage power. The conventional laptop battery design has evolved over the years and is nowadays amazing.

Broadly speaking, modern laptop batteries are made using lithium ion material which means they have a good power to weight balance than the conventional batteries. Over the years, the range of laptop batteries has increased and improved in functionality as well. The first batteries were AA batteries that



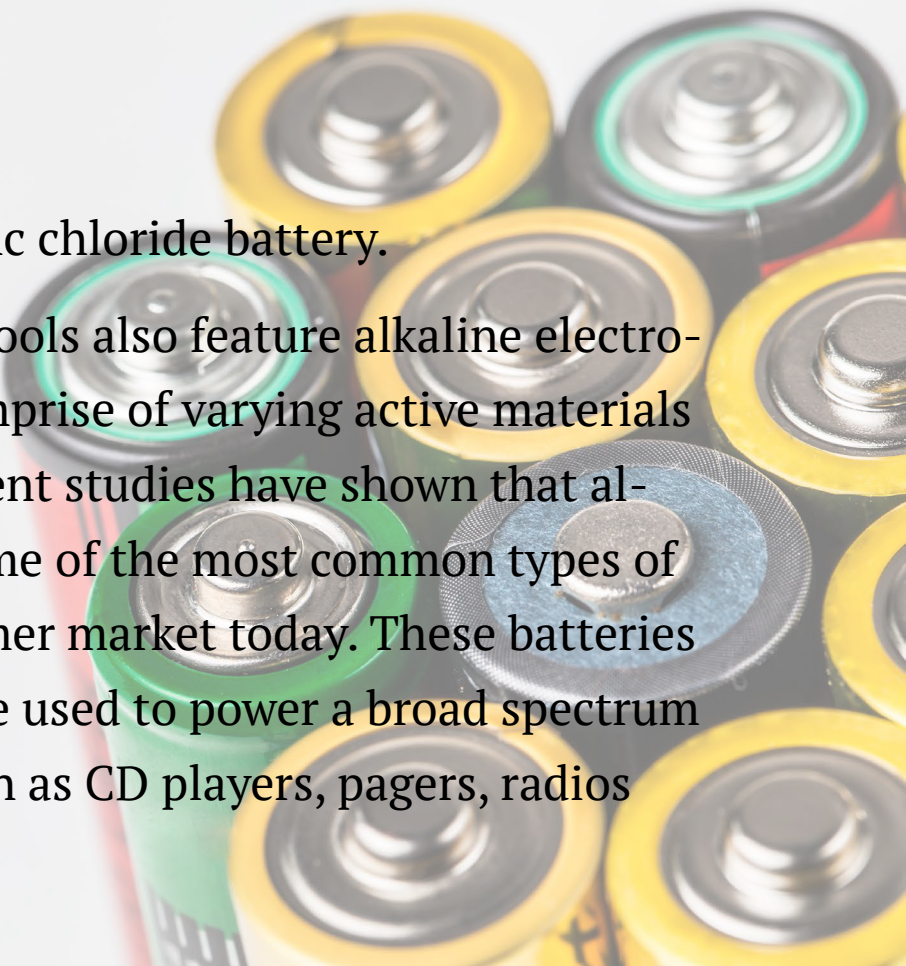
were rather inefficient but in recent time dedicated packs that work in various laptop models have become all the more indispensable.

ALKALINE BATTERIES



If you own a few remote controllers to operate your TVs and other small electronics, have children that play with electronic toys, use a remote to lock and unlock your car, and have a flashlight or two stashed for an emergency, you are probably one of the millions of people who constantly buy, use, and dispose of alkaline batteries. Alkaline batteries are widely used worldwide.

Alkaline batteries are powered by a unique reaction that occurs in between manganese dioxide and zinc. The rechargeable alkaline batteries are perfect for reuse since they come with superior cell design structures. When compared to the conventional zinc carbon batteries or even zinc chloride batteries, the alkaline batteries will provide enhanced energy density and longer life shelf with similar voltage levels. The `alkaline` term comes from how these batteries comprise of a special alkaline electrolyte of potassium hydroxide rather than the highly acidic zinc chloride and ammonium chloride material



of the conventional zinc chloride battery.

Various other battery tools also feature alkaline electrolytes but will often comprise of varying active materials for the electrodes. Recent studies have shown that alkaline batteries are some of the most common types of batteries in the consumer market today. These batteries are dynamic and can be used to power a broad spectrum of household tools such as CD players, pagers, radios and even toys as well.

CHAPTER 2 – HOW TO RECONDITION CELL PHONE BATTERIES

If your phone keeps on losing charge quickly, this might be a tell tale sign of a spoilt battery or even excessive background activity, which can lead to overheating. If such a situation occurs, ensure that you rule out any other causes before settling to recondition the batteries.

For instance, errors in software programs might lead to an increased drain on battery power. If you are sure that the software section is operating optimally, check the Li-ion batteries. These batteries have a lifespan like all other batteries and it

often averages in between two and three years of optimal performance. This depends on the practices that you implement when using the battery and your frequency of use as well. For instance, one who recharges their battery each time it drops to 50% charge is more likely to enjoy long-term battery performance than one who waits for all the power to run out.

One of the most common methods of improving the life of your battery is to place it in your freezer overnight. This will be followed by a charging procedure during the day, and you should repeat the same process for at least three times. Many professionals have realized the immense benefits of such a procedure and are nowadays selling batteries that have gone through the freezing procedure.





SAFETY FIRST!

First things, first—any time you are working with any type of battery, proceed with caution. Cell phone battery technology is so compressed that a small defect in the manufacturing can possibly cause meltdowns, fires, or an explosion. Know that this is a possibility, particularly if you can tell that the battery is getting too hot. Make sure you do not ever hold a hot battery close to your body and particularly your face. Also, do not leave a hot battery charging without being attended. Follow the instructions for reconditioning the phone carefully.

STEPS

Cell batteries are not affordable, and with constant use, you might soon discover that the battery is not as effective as it once was. The added benefit is that you can easily recondition the batteries using DIY techniques:

STEP 1 The first step is to let the phone battery run out until the phone shuts down. Then wait for an average of thirty minutes and turn on the phone again to ensure that all the power runs out.

STEP 2 At this point, the phone will have drained all its power, and you should then place it on the charger for an average of an hour after the phone indicates the charging procedure is complete.

STEP 3 Keep on using your phone and ensure that you let the power runs outs. Repeat

this procedure and then for the third time again.

STEP 4 The reconditioning procedure might take several days, but after three cycles, you will notice the notable improvement in performance.

Remember; ensure that you let all the power run out since this is important for a successful reconditioning procedure.

STEP 5 After repeating the cycle procedure to improve the capacity of your battery, ensure that you recharge it only after all the power runs out. The frequency levels of using

your phone determine how many times you can use the phone.

MAINTENANCE KEYS

When maintaining such a battery, let it discharge completely and place it in the fridge for several hours. Repeat the same procedure a couple of times, and you will notice the slight change in the capacity of the battery.

Similar to all batteries, ensure that you keep the battery safe from exposure to liquids and excessive heat such as direct sunlight.

Furthermore, avoid exposing your batteries to excessive forces since this might damage the chemical structure of the battery.



CHAPTER 3 – HOW TO RECONDI-TION LAPTOP BATTERIES

What can be more frustrating than waking up in the morning, packing your laptop in your computer bag, and heading out to work remotely, only to find that your laptop battery has gone completely dead and will not recharge? Sure you can leave the laptop plugged into an electrical outlet with the power cord, but what good is a portable laptop if you have to be tethered to an electrical outlet for it to operate?

Sometimes, if your laptop computer is not fairly new, you can't simply go out and buy a new battery. You may have order the



battery online and wait several days for it to be shipped and then several more days for it to be delivered to you. And that's if you can actually find the battery available! Who can go that long without using their laptop? People depend on their laptops for work and many other things on a daily basis.

Luckily, a significant portion of laptop batteries come with smart features and unique chemical structures. One common method of controlling the battery power entails what is known as the System Management Bus (SMB).

Other batteries come with a solid state switch that is placed in an off position, and no voltage is allowed to flow to the terminals. Most batteries will be turned on by connecting the switch to the terminal or perhaps pulling it up. If this procedure fails, then you might need to consult the brand manufacturers since some models are protected through the use of patented methods.

STEPS

STEP 1 Using a voltmeter to determine the polarity of the terminals, which is necessary for the connection.

If there is no voltage flowing, then the solid-state switch might be in an off position, and you should then activate it. Connect the voltmeter to the outer terminals and use a 100-Ohm resistor to close one end to ground and the other end to connect to either terminal. Repeat the procedure by connecting the resistor to a positive terminal.

If there is no flow of voltage, then the battery might have failed or is perhaps blocked by the brand manufacturer. Using the 100-Ohm resistor is low enough to activate the digital circuit and high enough to ensure the battery is safe against the effects of electrical short.

STEP 2 Complete the circuits by connecting the terminals to kick start the charging procedure. If the charge current fails after about half a minute, then you might need an activation code from your brand manufacturers. In some cases, some batteries come with a special switch that turns off the battery when it attains a certain age or cycle average.

STEP 3 Establish a connection in between the thermistor during the charging and discharging procedure to mitigate the

effects of overheating.

STEP 4 Following this, use an ohmmeter to look for the internal thermistor that is well labeled.

For instance, the NTC thermistor refers to a Negative Temperature Coefficient, and it means that resistance reduces as the temperature rises. On the contrary, the PTC batteries refer to Positive Temperature Coefficient, which leads to increased resistance levels.

STEP 5 After the repair process, the power gauge on the battery might be lacking the proper functionality, which might bring up incorrect readings. At this point, you may be inclined to recalibrate the battery by placing conduction a full charge procedure and discharging to reset the measuring points as well.



Note: Some batteries feature smart component that must be kept alive during the replacement procedure to avoid damaging the cells. In fact, disconnecting the power source for even a second might compromise the data in the memory.

In the same way a surgeon must keep all the organs of the patient active in the theater, it is the same way you should ensure that the battery never loses power during the recharging procedure.

The memory cells contain vital data such as resistor capacity and a coulomb counter as well. You can ensure a continuous supply of power when charging the cells by perhaps supplying a secondary voltage by using a 100-Ohm resistor to the circuit before disconnecting the power.

Detach the exterior power supply after the circuit obtains optimal voltage from the new cells. By the same token, some power gauges come with chips that run wires into each section of the cell.

MAINTENANCE

To maintain a battery, you can opt to power your laptop using a direct power source and remove the battery for later use. You will have to test this since some computers won't work efficiently with the battery removed. However, if the laptop still works fine even after you have detached it from the power source, then this might be a good method for maintaining the overall capacity of your battery. The chemical reactions that occur in the battery will occur even if the battery is not in the laptop. However, ensure that you don't live in areas that are prone to power outages since this can compromise your work.

HOW TO RECYCLE GOOD CELLS FROM A DEAD BATTERY?

There is always the potential that a dead battery may still have good cells in it. Here are some steps to use when recycling the good cells from such a battery.

- ★ First, start by identifying the weak sections on the battery along the seams and pry until the casing opens. Insert a screwdriver and twist to separate the components.
- ★ While some packs might open easily, some will

require some added efforts. Be cautious with this process.

- ★ If you find it difficult to locate a weak spot on the seams of the battery, use a Dremel saw or perhaps a cutting disk to cut the battery open. Ensure that you proceed with caution to avoid damaging the battery cells during the procedure.
- ★ Following this, remove the assembly out of the pack which are normally encased using double-sided tape and unique metal tabs.

- ★ Cut the tabs and wires that are connected to the charging circuit and in between the cells by using a wire cutter. At this point, you will need to determine the rating and specification of your battery.

- ★ The battery might have it printed on its body although you should check with the laptop manufacturer for confirmation.

- ★ In most cases, the batteries will be powered in parallel spots and then in a series to achieve



the optimal voltage capacity. Then, separate the individual cells.

- ★ Twist each parallel set of cells and separate them using a sharp object. Remove the solder tabs by using special nose pliers. Keep the tabs if you plan on reusing the cells in question.

- ★ After removing the tabs, use the Dremel to weld the points so the surface will be fully flat. Place all tabs and taps to the side and then dispose in a safe spot.
- ★ Measure the voltage of each cell, and if it averages less than 2.5 volts, then you should dispose it

off.

- ★ Charge the cells, and if it overheats during the charging procedure, then you should dispose it off.
- ★ Measure the voltage of the cell and ensure that it averages in between 4.1 and 4.3 volts.
- ★ Wait for half an hour and measure the cell voltage. If it has reduced to less than 4 volts, then this might not be useful. Otherwise, note the voltages down.



- ★ Keep the battery cells in a cool and dry place for an average of three days. Measure the voltage after this period and if it is less than 0.3 volts, then dispose it off.
- ★ Look for a power bank case. You can get one online or perhaps from a broken charger. Insert

the battery into the appropriate slot in the case, and the positive terminal of the battery should face the charging board. In some cases, the polarity of the battery is often indicated in the cases.

- ★ Then put it for charging by using the USB cable provided in the packet. Attach the keychain with the case. Finally, the power bank is ready for use.

CHAPTER 4 – MANAGING ALKALINE BATTERIES

Alkaline batteries are designed by the manufacturers to be disposed of when the charge is completely drained from the battery. Is there a better way for them to sell more batteries? In reality, alkaline batteries can be recharged about ten times. Ten recharges can extend the battery life considerably. Granted, the recharged alkaline battery will not be the same as a new battery or recharged battery that was designed to be recharged. Nonetheless, you can get plenty of extra life from a recharged alkaline battery.

Most alkaline batteries comprise of a cathode terminal and anode terminal. To be specific, alkaline batteries comprise of an anode that is made using zinc while the cathode is made using



magnesium oxide. Contemporary alkaline batteries also come with a special mix of carbon and cathode terminals.

In most cases, the chemical reactions will occur in the cathode and the anode caused by the individual interactions with ions in the alkaline electrolyte solution and potassium hydroxide as well. The zinc anode undergoes a reaction whereby that involves the formation of ions of potassium hydroxide.

Following this, the accumulation of the potassium hydroxide leads to the electrical difference in the cathode and anode. Besides that, the accumulation of electrons means that they would have been transferred to another section of the battery. However, the alkaline batteries, these excessive electrons would have been transferred to the magnesium oxide cathode. This is impossible since there is no direct connection in between the cathode and anode.

Allowing the additional electrons to move necessitates the use of a closed circuit, especially by using the battery in an electrical device. The movement of electrons from the anode to the cathode through the closed circuit will produce an electrical current, and this is how alkaline batteries are used to operate electronic devices.

WHAT MAKES THEM POPULAR?

One of the main benefits of alkaline batteries over the conventional batteries is that they provide an enhanced energy density. These batteries will often provide double the amount of energy of zinc carbon batteries and this will allow the battery to produce a similar amount of energy and lasts longer than most batteries. The rechargeable batteries will provide well over four times the capacity of the conventional nickel or metal hydride batteries.

Durability is also another notable benefit of these types of batteries. Alkaline batteries have a longer lifespan since they come with chloride type electrolytes. In fact, an alkaline battery may last up to seven years unused and lose an average of 6 percent of its energy each year.

Safety is also another notable benefit of the alkaline batteries. When compared to the acid based and lead-based batteries, alkaline batteries have minimal environmental impacts. More so, disposing and recycling these batteries is also a simple procedure.

Charging alkaline batteries is a relatively simple procedure and it also eco-friendly as well. Here are the steps:



SAFETY PRECAUTIONS

- Always wear rubber gloves that reach the elbows and safety goggles with side protectors when working with batteries.
- Do not smoke or have any form of flame or fire present in the vicinity of where you are reconditioning batteries.
- Wear a protective apron over your clothes.
- During the charging process, small amounts of hydrogen gas are generated. This can build up pressure in the battery, which can cause the outward container to burst and the contents to leak. If this happens while you are reconditioning a

batter, stop the charging and immediately dispose of the battery.

- Do not attempt to restore batteries that have corrosion on them.
- The voltage of the battery charger should be higher than that of the battery at full charge.
- When you connect the charger to the battery, make sure the terminals are connected correctly.

STEP 1 Find an adapter plug that you no longer use but can still provide a consistent power supply.

STEP 2 Establishing a backward power flow during the process of charging the battery might lead to current backflow, which might damage some adaptors. More so, you also want sufficient amperage since high current charging might lead to leaks and it is, therefore, important that you choose an adaptor with a low current capacity.

STEP 3 You will also need a working area and platform to control any spillages.

You can use a polyethylene floor surface or covering that is resistant to the effects of battery spillages. Connect the battery to the adapter by using alligator clip wires.

STEP 4 Connect the polarities correctly to avoid causing damage to the batteries.

For instance, during the charging procedure, connect the positive to the positive and repeat the same for the negative polarities. This might seem counterintuitive especially since a series circuit involves connecting the positive terminal to the negative terminal. Establish a backward connection to make this work.

STEP 5 A significant portion of transformers come with a

plus tip meaning that the inner circle comprises of a positive polarity while the outer ring comprises of a negative polarity. However, ensure that you test the connection first.

A good suggestion for you would be to use a small wire with a curved stick into the center hole to make it simple to clip wires on both connections of the transformer plugs.

- Wait for the charging procedure to complete. You may use a voltmeter to measure the voltage flowing across the wire by using an electrical tester. After few minutes of charging, remove the battery from the charger and measure the voltage using a multimeter.
- If the voltage levels are high, let the tools cool down and reposition the battery. Repeat this procedure until you achieve the desired capacity.
- After obtaining the ideal voltage, place your batteries in your chosen device, and if you completed the procedure correctly, you would notice that it has achieved optimal charge capacity.



MAINTENANCE PLANS

If your alkaline batteries are not in use, ensure that you store them in a cool, dry place away from the effects of sunlight or even water. Besides that, avoid using different battery brands at the same time since this might lead to adversities such as an explosion, damaging your battery or even your device as well. Never subject your battery to large forces since this will compromise the chemical structure of the battery.

MAKING THE MOST OF THE BATTERIES

Remember when using alkaline batteries that different devices will lose functionality at low voltage levels. The main point here is that you if the alkaline battery stops working in a high capacity device such as a flashlight, then it could be used in a low capacity device in a remote control or perhaps a clock. This could help you use the remaining energy depending on how well it works.

You can also make an additional battery pack by using a unique holder that you can purchase in online stores such as Amazon. For instance, a device that requires 4.5 volts might require the use of three 1.5 volt batteries. By using them three at the same time, you increase the voltage potential flowing for optimal power results.



CHAPTER 5 – SUPPLIES AND EQUIPMENT NEEDED

This chapter is about the many types of materials you will need to get the most out of the reconditioning process.

Smart charger. A smart battery charger is a high-frequency charger that controls the charging procedure to suit the unique specifications of your battery. The distinctive design of these batteries makes them perfect for use even when reconditioning batteries.

Voltmeter.

A voltmeter is a special instrument that is used to measure the potential voltage or difference between two electronic devices. These tools come with unique galvanometers, and the range of series resistance plays an importance role in the range of voltages that the battery can detect.



Protective gear.



This refers to gear such as gloves, eyeglasses and overalls to protect your clothing from the effects of staining or corrosion.

A reliable power source.

Another important tool that you will need is a reliable power source that you can use to operate your devices.

Power bank casing.

Since you are going to be recovering some of the cells in your laptop battery, you may decide to collect them and use them as a power bank for your Smartphone devices.



Dremel saw. The Dremel saw is a power tool that is perfect for prying open devices such as the laptop battery and even the well-covered cell phone batteries. These power tools come with unique settings that allow users to cut into even the toughest of battery covers.

Battery tester. This is a simple tool that is used to test the state of an electric battery including testing the charge present in the cells in the battery to other state characteristics such as the condition of the battery. In some cases, it's a simple tool that can be used to test the capacity of a battery to accumulate charge and to detect any performance flaws.

All of these items must be used properly for the best results. This is to check your batteries and to see that they work right.



CHAPTER 6 – SAFETY INSTRUCTIONS

- Never dismantle a battery since the interior materials might be toxic and cause damage to your skin and even your clothes.
- Avoid short-circuiting a battery since this can damage the product and lead to overheating that lead to burns.
- Never dispose the batteries into a fire since this can lead to an explosion. More so, never keep the batteries in a cool and dry place since water might lead to battery failure
- Never solder anything onto the connections of the battery. This can destroy the safety construction of the battery and might even damage the vent sections as well.
- Never place the batteries in a reversed manner with polarities reversed since this can lead to permanent damage to the battery, which may swell or even rupture.

- Avoid using an unspecified charger or a charger with modifications. This might disrupt the flow of current, which may damage the battery structure.
- Avoid charging a battery that has a significant amount of damage to it as it may leak or burst.
- Always avoid handling batteries that come with airtight compartments. This is because gasses might be emitted. This can lead to bursting or even rupturing as well.
- Never use the battery other than for the recommended purpose. Any slight variations in functionality might compromise the functionality of the battery.
- Avoid mixing different battery brands when powering your devices. More so, avoid mixing batteries with varying cell chemistries such as the conventional dry cell batteries. Any variations in the properties of the battery might lead to damage.

- Keep the batteries in a cool and dry place when not in use and avoid placing them in environments that have excessive heat or even direct sunlight.

- Never put batteries into plastic bags that are designed to protect components from the effects of electrostatic charge. These bags are often made using conductive material that may lead to short-circuiting.

CHAPTER 7 – CHECK EACH BATTERY INDIVIDUALLY

When all the batteries in your device fail to function, there is a huge chance that only a few of them are damaged. The remaining units will still have sufficient power, and you can replace them with new ones or perhaps recondition them as well.

For alkaline batteries, you should consider measuring the average voltage of the batteries by using a tester or even a voltmeter. If you discover that your batteries can still retain a good amount of charge, then you can just throw the spoilt ones away and keep using the good ones.

For instance, you one battery cell might be dead while the rest are still functioning. It is important that you use the batteries of the same condition together to control the effects of leaking. Alkaline batteries can only be excellent additions for your power source needs if you use them appropriately.

For the rechargeable batteries, if one battery undergoes discharging, then this might limit the capacity of the battery. If only one battery is weak, then ensure that you test the voltage of all the batteries, and if they average more than 1.2 volts, then this might be the ideal addition for your needs.

CONCLUSION

Getting the most of your batteries has never been easier for you to do than it is today. All your batteries can be restored and made to work for a while so long as you know how to make them work the right way.

You have to look properly at your batteries and test them as needed. They should also be handled with a responsible process that is safe and carefully controlled.

Be cautious when getting your batteries handled right. You have to use the right steps for getting them ready so they will be strong and continue to work for a long time.

Good luck with getting your batteries ready for any purpose. You will be amazed at what can happen with them if you take care of them properly.

