Notebook Batteries: Pitfalls and Tips

Avoid Running Out of Battery Power When You're On the Move

This article shows you:

- Why the battery always seems to be empty
- What you can do to help your notebook battery perform better
- How to lengthen the lifespan of the battery

A common frustration of notebook and netbook PCs is that you have to stop work unexpectedly early because the battery runs out of power. Perhaps the notebook was plugged into the mains only a short time ago, but after 30 minutes' use it suddenly reports that the battery is low and insists you shut it down.

Why does this happen? Is it due to the age of the battery? Does temperature play a part? Is it to do with the 'memory effect' of batteries? Does discharging and recharging really work? Read on to learn how to get the best from the battery in your portable PC.

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Is There a 'Right Way' to Use Batteries?

The right or wrong way?

Wherever the topic crops up, you'll find heated discussions concerning the 'right' or 'wrong' way to work with the batteries in portable computers. Certainly there are some indisputable facts which answer some questions, and a wealth of rumour, supposition, and received wisdom that may sway users in one direction or another.

However, the simple truth is that there's no absolute 'right' or 'wrong' way to work with batteries. At the end of the day, the way you choose to use your notebook or netbook PC plays a crucial role. There's also the question of where your priorities lie.

Two approaches to battery use

When you're using a battery-powered computer, you can choose between two different approaches: you can either go with simplicity and convenience, effectively ignoring the battery, or you can aim to save money. Over the following pages I'll explain the difference between these approaches.

What Happens When a Battery is Constantly Being Charged?

How notebook batteries work

In order to take care of your notebook or netbook battery, it helps to know a little about how the battery works, and what happens when it's being charged or discharged.

Here are a few vital points about the batteries used in portable computers:

Batteries are rechargeable

- The batteries used in notebook and netbook computers are rechargeable: unlike conventional batteries, they have special charging circuitry that can be connected to the domestic electricity supply.

- Although the charging circuitry is integrated into the computer, the power pack that transforms the 240 volts of domestic electricity into the voltage required for the computer itself isn't. This separate power pack is plugged into the mains and connects to the PC to charge the battery.

Transformer powers the PC

- When you connect the PC to its power pack and plug it into the mains, not only does it charge the battery but it supplies the notebook with power directly.

Batteries 'age'

- All rechargeable batteries 'age' over time, regardless of their type or their internal workings. This is true of the simple lead batteries as well as the more expensive lithium ion (Li-ion) and nickel cadmium (NiCad) batteries. If a battery is old, it won't store as much charge as it did in its first flush of youth, and it discharges faster. Typically, cheaper batteries tend to age sooner than the more expensive types. Modern notebooks and netbooks are supplied with lithium ion batteries since only this type of battery is able to provide the latest PCs with sufficient power.

Effects of heat and cold

- Heat and cold are two of the battery's greatest enemies. If a notebook battery is frequently used at temperatures notably higher or lower than typical room temperature, it will age much more quickly. You should take the temperature into account if you use a notebook PC on a long holiday in a hot climate, or if you tend to leave it in a cold car during winter months.

Memory effect

- A big problem with non-lithium ion batteries is the so-called 'memory effect' in which the battery 'remembers' if it hasn't been completely discharged before being charged again. For instance, if you regularly discharge a battery to 60% of its capacity and then plug in into the mains again to recharge it, it will eventually 'remember' this figure and never discharge below that 60% mark. As a consequence,

you can find that a battery with a quoted life to 3 or 4 hours suddenly seems to be empty just a few minutes after you start using it.

Batteries shouldn't be charging

- Unfortunately, the notebook battery isn't simply 'switched off' once it has been fully charged. Instead, if the notebook is connected to the mains, it's constantly being recharged. Most PC manufacturers include features that recognise when the battery is fully charged and switch to a 'trickle charge'. In principle, this should ensure that the battery always provides 100% of its possible power when you disconnect the notebook from the mains and use it on battery power.
- The constant recharging of the battery causes it to age more quickly than it should, or, as a result of the 'memory effect', causes it to wear out and no longer provide the performance you expect from it.

Lifespan of one to three years

- It's impossible to foresee when a battery will start to 'age', but in general, the better the quality of the battery, the longer its lifespan. With most batteries, you'll start to notice reduced performance after as little as a year of use, and after two or three years some batteries can charge very poorly and give only a few minutes' use.

Two Solutions: Battery Care or Convenience

Once you know what happens if you keep your notebook or netbook permanently plugged into the mains and charging, you have to decide how you're going to use it – whether you'll try to take good care of the battery, or whether you prefer to opt for simplicity and convenience:

Remove the battery?

- Let's say you remove the battery from the PC as soon as you connect it to the mains. This won't cause any

problems, because the computer is being powered directly from its external power pack. However, when you need to use the computer on battery power, the battery won't be fully charged.

The battery will gradually discharge itself

If you charge the battery fully after connecting the PC to the mains, and then remove the battery when it's full, that may not help either, because most batteries have a high 'self-discharge' rate: a battery that's fully charged, but then left to one side, will usually be empty in between one and three weeks, depending on its age and quality.

Store the battery carefully

- When the battery is removed from the computer, it's possible for its contacts to get dirty. However, in practice, this rarely causes a problem. To avoid short-circuiting the battery, though, avoid touching the contacts, and make sure they don't come into contact with any other objects. In particular, keep the contacts away from metal objects and other conductive materials.

Discharge the battery

- When you disconnect the PC from the mains supply, you should ideally use it until its battery has completely discharged. When the battery is empty, connect it to the mains again and keep it connected until it has fully recharged.

  This cycle of fully-discharging then fully-recharging a battery exercises it and maximises its useful lifespan. The problem is that this doesn't usually match the way we use our portable PCs: it's not always possible to know when you'll need to use the machine on battery power, or for how long you'll be using it.

One other point worth considering is what happens to your portable PC in the event of a power cut. If you're using it on mains power with the battery removed (or with a worn-out battery that contains little or no charge), the PC will switch off, probably causing you to

lose whatever you were working on (and, just possibly, resulting in wider problems with Windows itself).

In practice, of course, this is exactly the problem that all users of desktop PCs face, since few users have their desktop PCs connected to backup power supplies. However, one inescapable benefit of using a notebook or netbook PC with a healthy battery connected is that, in the event of a power cut, the machine instantly switches to battery power, protecting your work and enabling you to continue as if nothing had happened.

Two possible solutions

So what should you do? You can choose between the following two solutions, depending on whether you opt for battery care or the convenient approach:

Solution 1 – battery care

Remove the battery for longer lifespan

If you mostly use your notebook or netbook at home, and you always keep it connected to the mains during use, you can remove its battery. (This option has the added advantage that your machine will be a considerably lighter weight to carry around or place on your lap!) Don't forget to slot the battery back into the PC early enough to give it a full charge before you need it on the move.

This method obviously requires more effort and forethought, but by doing this your battery will last longer, saving you the aggravation and expense of buying a replacement.

Solution 2 – convenience

Accept a reduced lifespan

If the frequent need to disconnect and reconnect the battery (and to remember to reconnect it in good time) seems like too much aggravation, you can plump for the simple option – leaving the battery in place permanently and just ignoring it. This makes things easy, but it does mean that the battery's lifespan will be reduced to just two or three years.

Regularly exercise the battery

If you can face putting in a little more effort every so often, there's a better solution. At regular intervals, when you know you'll be using your PC for several hours, unplug it from the mains and use it on battery power until the battery runs down, then plug it into the mains again and allow it to recharge fully (either while you continue using it, or just leaving it to one side for a couple of hours). This regular exercising of the battery will help it last longer, and doing this as little as once a month will still pay dividends.

You can buy replacement battery packs for all current notebook and netbook PCs, either direct from the PC manufacturer or from third parties like All Batteries (www.allbatteries.co.uk) or Amazon (www.amazon.co.uk). A replacement battery pack will cost between £40 and £70. The older the notebook, the more difficult it is to find a replacement battery pack.

It's not usually worth buying a spare battery for a notebook PC unless you know you'll need it and use it, since batteries age faster if they're not actively used. However, if you know you'll frequently be using your machine on battery power for long periods, and you can put up with exercising both batteries regularly, two batteries will obviously double your working time when you can't get to a mains socket.

How to Check the Charge Status of Your Battery

Quickly check the remaining charge

While you're using your notebook or netbook, or before you stop work and shut it down, you want to know how much power remains in its battery. You can find out the charge status of a battery quickly and easily in Windows. Here's how:

1. At the far right of the taskbar, near the clock, look for a little battery symbol. This can vary in appearance depending on your version of Windows, but it should be fairly easy to recognise.

2. If you hold the mouse over this battery icon, a tooltip will appear displaying the percentage of charge remaining and an approximation of how much longer you can continue to use the machine on battery power in hours and minutes.

3. For more information and options relating to battery usage, click the battery icon once using the left mouse button. Like the icon itself, the information displayed will vary from one version of Windows to another.