Battery Safety Guide

“Always buy from a reputable vendor that is proud of the quality of their goods.”
Introduction

Most of us enjoy problem-free interaction with one or more Li-ion batteries on a daily basis, in our smartphones, tablets, laptops, and other battery-powered devices. Very few of us give any thought about the safety of these devices, except for the occasional—quickly forgotten—news story or warning not to leave spare Li-ion batteries in checked bags on airplanes and pockets with keys or loose change.

The fact is, manufacturers of these products are very familiar with the potential safety issues associated with Li-ion batteries and follow standardized design approaches to ensure a high level of safety.

It is worth remembering that no battery is inherently safe. Cells contain significant quantities of energy and have no ‘off’ switch, posing a shock and arc-flash risk to personnel. Electrolytes may pose a chemical hazard.

Li-ion technologies are attractive because of their high energy density, but that feature brings with it an increased level of risk if not handled correctly.
Vendor Information

- Source batteries from a reliable supplier and validate authenticity.
- Ensure batteries are stored correctly away from heat sources and away from a potential source for a direct short.
- Unless a battery is sold with a mod, question the potential usage.
- Give advice on correct storage, charging, and transportation.
- Never sell a battery that is not contained in either a box, sleeve or a means by which a direct short is not possible during transportation. A battery as part of a package will be secured in either the mod or the packaging.

There have been some reports recently of exploding batteries and calls for greater regulation.

Some of these incidents could have been prevented with correct advise and guidance. A documented procedure would be valuable for vendors to have in place that all staff members understand and adhere to.
Pen Style / Ego Batteries

- Turn your battery off when not in use (3 or 5 click system).
- Only use charging equipment supplied with the battery, or that is specifically designed to be used with that particular model of battery.
- Do not overtighten your battery when attaching it to your charger or atomiser, finger tight is enough.
- Do not leave your battery unattended when charging at anytime.
- Once your battery has finished charging, remove it from the charger as soon as possible, the instruction manual will let you know what to expect the LED to display for a fully charged battery.
- Do not use your battery if it is damaged, looks swollen, or feels hot.
- Do not expose your battery to extreme heat or cold.
- Avoid direct contact with water.
- If your battery needs cleaning, use tissue or alcohol wipes.
- Do not continue to use batteries that have ceased to function normally.
Mods With Built In Batteries

- Always charge batteries specifically as directed in the product instruction manual.
- Do not use your mod if it feels hot especially if the mod has been dropped or damaged.
- Only use the recommended charging equipment.
- Only use the correct USB charging lead and ensure the output of the USB plug or socket is correctly rated.
- Do not leave your mod unattended when charging.
- Do not leave your mod charging overnight.
- Once your mod has finished charging, remove it from the charger as soon as possible.
- Do not expose your mod to extreme heat or cold.
- Avoid direct contact with water.
- Ensure the mod is turned off when not in use or placing in a pocket or bag.
- Never use a damaged battery.
External Battery Cell Information
Applicable In The Following Sections

• Do not store spare battery cells in your pocket or bag with other metal objects (coins, keys etc.) as this can short out the battery and potentially cause the battery to vent.
• If you need to carry a spare ensure it is in a protective box or sleeve.
• Do not use your battery if it is damaged, looks swollen, or feels hot.
• Do not use a battery if the plastic insulating sleeve is damaged in any way.
• Only use the recommended charging equipment.
• Do not leave your battery unattended when charging.
• Do not leave your battery charging overnight.
• Once your battery has finished charging, remove it from the charger as soon as possible.
• Do not expose your battery to extreme heat or cold.
• Avoid direct contact with water.
Single Cell Mods
With Electronic Control (Regulated)

- Check that the product or packaging displays the correct CE safety markings and that the distributor can prove their authenticity.
- Ensure the battery is inserted in the correct orientation + and -.
- Only use the correct electronic settings for the atomiser attached as to not cause stress on the battery.
- Use a correctly rated battery for the attached atomiser.
- Ensure the mod is turned off when not in use or placing in a pocket or bag.
- Do not expose your mod to extreme heat or cold.
- Avoid direct contact with water.
- Read the included instructions. Some mods allow charging via the USB socket and some require an external charger.
- Never use a damaged battery.
Single Cell Mechanical Mods
(Unregulated)

- Ensure the battery is inserted in the correct orientation + and - as unregulated mods have no protection for reverse polarity.
- It is recommended to measure the resistance of the coil (in ohms) prior to attaching the atomizer or self built coil to the mod.
- Only use the correctly rated battery for the atomiser or build you plan to use on the mod.
- Never use a battery with any damage to the wrapping in this type of mod.
- If the battery will not slide in with ease do not force the battery.
- If the mod starts to feel hot stop using immediately.
- Ensure the mod is locked off when not in use or placing in a pocket or bag.
- Never use a damaged battery.
In a device that requires two or more batteries it is highly recommended that a matched set is used. These should be new batteries that have had no usage in any other device.

Regulated mods will usually show the charge rate in each cell during use and will provide a balanced charge via the USB socket.

Mech mods are reliant on the user correctly charging the batteries prior to use and the use of a multi meter to monitor charged cell voltages prior to use.

It is highly recommended that if a cell in a matched set starts to fail or will not charge correctly, all batteries must be replaced.
Multiple Cell Regulated Mod

- Check that the product or packaging displays the correct CE safety markings and that the distributor can prove their authenticity.
- Ensure the battery is inserted in the correct orientation + and -.
- Only use the correct electronic settings for the atomiser attached as to not cause stress on the batteries.
- Use a correctly rated battery for the attached atomiser.
- Ensure the mod is turned off when not in use or placing in a pocket or bag.
- Do not expose your mod to extreme heat or cold.
- Avoid direct contact with water.
- Read the included instructions, some mods allow charging via the USB socket, some require an external charger.
- Ensure all batteries are new and used as a matched set.
- Charge all batteries at the same time as a set if using an external charger.
- If one battery starts to fail or will not charge correctly, all batteries must be replaced.
- Never use a damaged battery.
Multiple Cell Unregulated Mod
Series And Parallel Explanation

Series
Series mods are devices that add the combined voltage that is being applied to the resistance of the coil / atomiser. This type of circuit creates a current from each battery at the same time and combines the voltage from each battery. While the voltage is multiplied by the number of batteries, the amp draw remains at that of a single battery.

Single 18650 battery- 4.2v with 35 amp
Dual 18650 battery in series- 8.4v with 35 amp

Parallel
Parallel mods are devices that split the current between two or more batteries at the same time. While the total voltage remains that of a single battery (4.2v), the total battery life (or mAh rating) is increased as well as the overall amperage since there is less draw on any one battery in the circuit.

Single 18650 battery- 4.2v with 35 amp /2500 mAh
Dual 18650 battery in parallel- 4.2v with 70 amp / 5000mAh
Multiple Cell Unregulated Mod
Series And Parallel Explanation

• Ensure that each battery is inserted in the correct orientation + and -, this will differ for series and parallel. Putting in batteries incorrectly will cause a direct short.

• It is recommended to measure the ohms of the coil prior to attaching the atomiser or self built coil to the mod.

• Only use the correctly rated battery for the atomiser or build you plan to use on the mod.

• Never use a battery with any damage to the wrapping in this type of mod.

• If the mod starts to feel hot stop using immediately.

• Ensure the mod is locked off when not in use or placing in a pocket or bag.

• Series and parallel mods are only advised for use by people with a very good understanding of battery safety and ohms law, and batteries must be used and charged as a matched pair.

• Never use a damaged battery.
Atomiser Resistance

- Atomisers come in different resistances – so it is important to use an atomizer that is within the safe operating limits of the battery.
- New vapers will start with a pre-made coil / mod combo. Most of the pre built atomizers are safe to use with the majority of vape batteries out there on a regulated mod.
- The regulated mod will have protection and not fire if the resistance is too low or the battery cannot deliver the required voltage given the setting used.
- As users get more advanced, they might want to experiment by building their own coils. This is where the vendor can offer advice on the safe ranges of specific battery types, amp ratings and suitability for the mod type.
Battery Charging: Ego Type Cells

Most batteries of this type have the charging circuit built into the battery. Some batteries have no charging circuit and this is built into the charger. Only charge a battery with the charger that was provided with the battery, or which has been specifically supplied for that battery.

While chargers may look similar, mixing a battery with no charging circuit and a charger without proper regulation is a recipe for disaster.

• Ensure the battery and the charger threads are clean prior to charging.
• Do not over tighten when attaching to the charger.
• Although a PC port can be used it will take far longer to charge the cell.
• Ensure the USB power source is correctly rated for the battery.
• Charge on a flat hard surface never place a charger directly on a carpeted floor (place the charger on a non-combustible surface).
• Never leave a charging battery unattended or charging overnight.
Battery Charging: On Board Charging

It is worth noting not all mods with a micro USB port have the capability for on-board charging. Ensure the facility is available particularly for mods that have removable cells.

- Check that the micro USB connection is free of dust and debris.
- Although a PC port can be used it will take far longer to charge cells especially in multi cell mods.
- Ensure the USB power source is correctly rated for the mod. Some mods will limit the amp pull some will have a rating. 1amp would be a recommended rating for either an external USB plug top. If using a mains plug with built in USB sockets select the 1amp socket. Some mods have the capacity to take a 2amp charge and care should be taken to identify the correct charging source.
- Charge on a flat hard surface never place a charger directly on a carpeted floor (place the charger on a non-combustible surface).
- Never leave a charging battery unattended or charging overnight.
Battery Charging: Exposed Cell Charging

An exposed cell is defined as one that is removed from the mod for the means of charging.

- Check that the charger displays the correct CE safety markings and that the distributor can prove their authenticity. Batch production numbers should be printed on the product.
- Ensure that each battery is inserted in the correct orientation + and –.
- Some external chargers have a selectable amp rating (1-2amp) we recommend using the 1amp setting for 18650 batteries.
- Charge on a flat hard surface never place a charger directly on a carpeted floor (place the charger on a non-combustible surface).
- Never leave a charging battery unattended or charging overnight.
- Once the charging cycle is complete remove the battery and is possible meter the voltage and place in a protective sleeve or case.
- If charging as a matched pair store the batteries together to avoid confusion.
- A fully charged 18650 will be at 4.2v.
Battery Disposal

The UK throws away 600 million household batteries every year. At present only one third are collected and recycled with the remaining batteries being sent to landfill as general waste. These will eventually break down and the dangerous chemicals may leach out resulting in soil and water pollution, in turn causing damage to our natural ecosystems and wildlife.

The materials held within the batteries can be recovered and reused. This will reduce the demand for raw materials required each year and help preserve resources. As some of the materials are heavy metals such as lead and mercury, it is important that they do not end up in the waste stream.

To help make it easier for you to be able to recycle batteries, collection containers are available throughout the UK. Keep an eye out for them in a variety of locations, including your workplace, shops, libraries, schools, and your local household waste and recycling centre.