



Home fire safety fact sheet

Lithium-ion batteries, tools and e-bikes - Battery and charging safety

How do you identify a lithium battery?

Lithium-ion batteries come in various formats (i.e., cylindrical, flat, rectangular, pouch, and device specific) and can be difficult to identify as there is currently no requirement or standard for labelling or marking.

The most common devices they are found in:

- E-bikes and scooters
- E-Cigarettes
- Children's toys
- Cordless drills
- Mobile phones
- Electric wheelchairs
- Battery operated furniture
- Laptops
- Tablet devices
- Electric motor vehicles
- Battery energy storage systems, attached to your solar system

Most Lithium-ion batteries will have some form of printing on them which contains either the words 'lithium ion', 'Li-ion', 'Li-po', 'Lithium-polymer', or some other variation of 'Li' to denote the chemistry. If the battery is rechargeable and has 'Li' or 'Lithium' printed on it, you can safely assume that it is a lithium-ion battery.

Common causes of battery fires

Lithium-ion batteries are energy-dense and contain electrolytes that are highly flammable. Lithium-ion batteries are safest when used according to manufacturer's instructions. There are several avoidable situations which may lead to lithium-ion batteries catching fire, including:

- Overcharging.
- Use of non-compliant charging equipment.
- Overheating from exposure to heat or extreme temperatures.
- Physical abuse (e.g. dropping, crushing, piercing, and/or vibrations).
- Short-circuiting, battery cell malfunctions or system faults.

- Modifying or tampering with battery system.
- Defects or contamination introduced during manufacture.
- Installing used batteries into a new or different device.

When lithium-ion batteries fail they may enter a process called 'thermal runaway'. This involves violent bursting of the battery cells, which may release a toxic, flammable and explosive gas. The fire that could result is a self-sustaining fire that may be difficult to extinguish.

In an EMERGENCY – Call Triple 000

Do NOT touch anything that is on fire.

If any device or battery starts to give off smoke or emit flames:

- Call Triple Zero (000)
- Evacuate the area and close doors behind you, this may slow the spread of smoke and fire.
- Do not re-enter the building for any reason, until the area is made safe by firefighters.

Avoid inhaling the vented battery gases, vapour, and smoke as it is highly toxic. If anyone has been exposed to spilt electrolyte, flying debris, smoke, vapours, or flames, seek urgent medical assistance.

Burns should be treated immediately with cool running water for at least 20 minutes. Burns larger than a 20-cent coin require emergency care. Call Triple Zero (000) and follow the advice of the operator.

If a small battery or device such as a phone or tablet starts overheating:

- Unplug it from the power outlet if safe to do so.
- If safe to do so, remove it to an outside area away from any combustible material and away from windows or doorways. (4 metres)
- Be aware the device may be hot and could cause burns.
- Small flames can be doused with a bucket of water or a garden hose to stop the fire spreading to nearby objects. Make sure the device is not plugged in to mains power or near other powered equipment when applying water.
- Use a fire blanket or a fire extinguisher (dry chemical powder or carbon dioxide are options to consider). Only attempt to use them from a safe distance and up wind, away from any smoke or vapours. These may be used to prevent the spread of fire to the surrounding area but are not likely to fully extinguish a lithium-ion battery fire.
- Call Triple Zero (000) even if you no longer see visible smoke or flames. There is a chance that the battery may reignite if it has not been sufficiently cooled.

SAFETY FIRST - WHEN HANDLING AND STORING BATTERIES.

DO NOT

- Never try to build your own battery.
- Do not buy replacement batteries or chargers online – always purchase compatible items from reputable retailers and follow the manufacturers advise.
- Do not use or charge batteries or devices that show signs of swelling or bulging, leaking, overheating, or signs of mechanical damage (cracked, dented, punctured, or crushed).
- Do not dispose batteries in regular household waste or home recycling bins, as they can cause fires during waste collection, transportation, handling, and processing.
- Do not expose batteries or any electronic device to direct sunlight.
- Do not store or leave batteries and devices in areas where they can be exposed to heat and or moisture.
- Do not leave batteries or devices unattended while being charged, do not charge batteries overnight, if unattended.
- Do not charge batteries or devices on combustible or insulating materials such as beds (under pillows), sofas or carpet.
- Do not leave **any device** on continuous charge. This is an example of overcharging

DO

- Only use chargers that are supplied with the equipment or device, or certified third-party charging equipment that is compatible with the battery specifications.
- Check that chargers have the Australian Regulatory Compliance Mark, to show that it meets the relevant Australian Standards.
- Once the indicator shows that a device or battery has been fully charged, disconnect it from the charger.
- **Children should always seek help from an adult** when charging these devices, to avoid over charging and ensuring the use of the correct charger for that device.
- Consider charging devices with large batteries away from living spaces and other ignition sources or fuels.
- Be aware of the risks related to damaged batteries. These include electric shock, secondary fire risks, and exposure to toxic, corrosive, or flammable vapours and substances, and super-heated metal.
- Consider the use of personal protective clothing and equipment when handling damaged batteries or devices. E.g. thick safety gloves and eye protection
- Fire or smoke damaged batteries should be kept outside in a well-ventilated area on a non-combustible surface. Store **at least 3 metres** from any structures and/or combustible materials.

- Small batteries or devices can be placed in a container of water to cool and prevent further ignitions. Small batteries that have had water or liquid penetration or have been submerged in water should be removed from any device or appliance. Dry and wipe down terminals to prevent corrosion and short circuiting.

How can I recycle my batteries?

Batteries that show any signs of damage should be disposed of carefully as they carry a risk of igniting.

Damaged batteries and battery-powered devices include:

- Batteries and/or devices that have been involved in or exposed to fire.
- Overheated batteries that may have been emitting vapours or smoke.
- Batteries that show signs of swelling or bulging, leaking, cracks, dents, punctures, or crushing.
- Batteries that have had any water or liquid penetrate the battery or have been submerged in water. Where possible, remove them from any device or appliance, dry and wipe down terminals to prevent corrosion and short circuiting.

Lithium-ion batteries should not be placed into household waste bins or recycling bins.

Undamaged batteries can be safely disposed of at a battery recycling drop off point. It is recommended that battery terminals are taped over with sticky tape or electrical tape before placing them into battery recycling collection bins.

If your batteries are damaged. Seek expert advice of how best to store batteries when transporting to the recycling centre.

For further information about battery recycling go to the Australian Battery Recycling Initiative,

<https://batteryrecycling.org.au/>