WORKING TOGETHER TO MANAGE BUSINESS RISK

# Lithium-ion batteries

## The low-down on Lithium-ion battery safety

Lithium-ion batteries are powering everything from our mobile devices, business tools, bikes, vehicles, homes and businesses.

They're generally safe, but if not handled, stored, or charged correctly they can cause fire and explosion.

## What are Lithium-ion batteries?

Lithium-ion batteries are rechargeable, and they pack a lot of energy for their size. Typically, they consist of a series of cells that discharge energy though an electrochemical reaction between lithium compounds and other chemicals like graphite, lithium salt, and a flammable solvent. The cells are separated by dividers within the battery to protect them from damage.

## Knowing the risks – fire and explosion

Lithium-ion batteries are great because they provide efficiency & convenience for private and business uses. A downside to this is they can be exposed to serious issues such as overheating, overcharging, internal short-circuiting, or affecting electrical systems. These issues may create a condition called 'thermal runaway'. While the batteries are fitted with mechanical and electronic safety mechanisms to prevent overcharging and overheating, failures can still happen and can cause explosion and fire ignition.

The damage from these fires can be extensive as lithium-ion batteries emit large amounts of toxic, corrosive, and explosive gases which can cause the fire to re-ignite even after it's been extinguished.

But there is good news. There are simple steps and controls you can put in place to reduce the chance of your lithium-ion batteries becoming unstable. While it might take a little extra effort it's worth it to help protect your business, home and most importantly, your people.

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## Knowledge is power

### Charging

When running a business it's important that your battery power tools are charged and ready to go. It's worth thinking about how you can do this as safely as possible.

- Only use the chargers that came with the battery. Avoid using third party batteries, while cheaper, these can be a much lower quality and may lack some safety features – it's not worth the risk.
- Make sure batteries are not left charging unattended. If this is not possible, have remote surveillance so you can act quickly if needed.
- Ensure your lithium-ion batteries have an automatic switch-off function as this can help prevent overcharging or overheating during charging periods. If your charger or battery doesn't come with this, invest in timers to control the power supply. There are different options available from devices added to the socket through to remotely accessed control.
- Keep fire exits and main passage ways clear of any charging device, to ensure safe exit routes for your team.
- Have early warning devices such as smoke detectors in place to alert your team – remember safety of people should always be the first priority.
- Ideally install charging stations & charging points outside the building, possibly in a purpose-built enclosure. 10m from your site building is an ideal distance, well away from other combustible items. It should be easy for the fire brigade to access the area. This is especially important in multi-unit dwellings. Aim to have all lithium-ion battery charging in one area.
- The charging station/charging point and associated electrical systems including switchboards should comply to New Zealand electrical wiring standard code (AS/NZS 3000:2005), if in doubt it might be worth getting a certified electrician to check your set up.
- If you are installing charging devices or rapid charging ensure the existing electrical systems can accommodate the extra load safely. Your registered electrician will be able to help with this.

### Storage

- Damaged batteries are a huge risk. If a battery is not working as it should, has been dropped or is not charging, do not store it inside the building. Consider disposing of it safely and replacing it with a new battery.
- This could include batteries in a phone, tool, or vehicles, or even things such as e-bikes that a team member uses for transport.
- Think twice about buying second-hand batteries as they could be damaged or compromised.
- Always store lithium-ion batteries at room temperature and try to avoid contact with direct sunlight.
- Don't carry or store batteries with metal items, this can lead to them short circuiting.
- Have a designated area for employees to store tools and larger devices when they're not in use.

### Usage

- Don't expose lithium-ion batteries to moisture as it can damage the batteries. If using tools offsite in wet environments consider using protective covers and avoid resting them on wet surfaces when not in use.
- Don't expose lithium-ion batteries to excessive heat. If they feel very hot to touch, stop using them without delay, put them in an area away from flammable material, buildings and people and keep monitoring them. Assess if they are safe to keep using or if it's time for the battery to be replaced.
- Handle batteries with care – avoid dropping or storing in tool boxes with sharp objects that could damage them.
- It's also important to consider safe disposal of batteries. Lithium-ion batteries should not be placed in general waste or recycling bins as they can cause fires during waste collection.
- Undamaged batteries that are not swollen, punctured, or leaking can be safely recycled. Ensure you contact your local council for advice on safe disposal or recycling.

## Staying informed

Awareness and education about the risks, how to safely manage lithium-ion batteries and regular reminders are really important. After all, everyone pays a role in keeping the workplace and their colleagues safe.

- Establish processes and ways of working to protect the integrity of lithium-ion batteries. Ensure this forms part of your induction processes and send out reminders to staff to keep it top of mind.
- For team members who use e-scooters, e-bikes or e-vehicles (EV) ensure there is a dedicated place for these to be located during the day. (Check out our Electric Vehicle guide)
- Ensure your team know exactly what they should and shouldn't do in the event of a battery overheating or explosion potential. This should be part of your health and safety plan.

Visit **vero.co.nz/risk-profiler** to check out our other risk guides for more tips and in-depth information about managing risk.

**Disclaimer** – The information presented is of a general nature only and is provided only to help you understand some of the physical risks a business may have and what an insurer might expect you do to manage those risks. It is not intended for any other purpose. You should always seek appropriate professional advice about how you manage the particular risks in your business. No representation or warranty, expressed or implied, is made as to the accuracy or completeness of the information and no responsibility is accepted for any loss, penalty or damages (including special or consequential damages) arising out of the use of all or part of the information. The information presented does not replace the need for appropriate professional advice. Reliance on this communication will not affect or influence policy response.

RMA2/9 **05/24**