

# Your Risk Management guide to **lithium batteries**



Lithium batteries offer several advantages when compared to traditional batteries. However, because they contain flammable materials, care must be taken to safely use, store and dispose of them correctly.

If handled poorly lithium batteries can have a reduced lifespan, potentially catch fire or even explode. Below is some helpful advice on how to safely use lithium batteries.

## Advantages of using lithium batteries

Compared to regular batteries, lithium batteries:

- ▶ Hold more energy, so can last longer and provide more power.
- ▶ Typically they can be discharged to around 20% of battery capacity, without causing damage.
- ▶ Can be charged faster than regular batteries.
- ▶ Don't develop a memory over time, allowing users to 'top up' a battery's charge without negatively affecting its lifespan.

## Where are lithium batteries commonly used?

Lithium batteries are used in most energy-intensive electronics. Lithium battery technology makes devices like power tools, personal electronics, scooters and forklifts more useful and cost-effective to manufacture. Additionally, lithium batteries are increasingly being used in new technology such as energy storage systems seen in commercial and residential structures.

## Safe lithium battery disposal

There are two types of lithium batteries – single-use and rechargeable – each require a different approach to disposal.

- ▶ Single-use lithium batteries are like traditional-sized batteries and should be disposed of at a local recycling centre.

- ▶ Rechargeable lithium batteries are available in a range of forms, soft and hard cases etc. Disposal of them into your rubbish/general waste can result in fires at your premises and transfer stations or en route. Check with the manufacturer or your local battery disposal location for the correct way to dispose or recycle them.

## Safe lithium battery charging

Lithium batteries have different chemistries, so for information on how to properly charge or store your device and batteries long-term, contact the manufacturer.

If you notice anything out of the ordinary, you should stop charging the battery. If you can separate the battery from the device easily and safely, do so. Move to a safe location that is well clear of combustible material. Check with your manufacturer for further instructions.

## When charging your lithium battery, please ensure you:

- ▶ Display a Hazard Warning Notice in the charging area.
- ▶ Have a fire extinguisher in the charging area.
- ▶ Always charge in a safe place (concrete floor or steel bench) which is clear of combustibles.
- ▶ Use lithium (Lipo) charging bags, where possible.
- ▶ Always be aware of the state of charge in your lithium batteries to avoid discharging below the manufacturers recommended minimum state of charge.
- ▶ Always supervise the charging of your lithium batteries.

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## What do I do if the battery or electronic device starts to burn?

If a fire breaks out, dial 111 immediately.

If it is safe to do so:

- ▶ Use a fire extinguisher to put out the flames to prevent any further fire spreading.
- ▶ Contain it within a fire blanket.
- ▶ Relocate it to a safe distance away from combustibles.

A lithium battery fire is unlike any other fire because everything needed to start it and keep it going is contained within the battery. **Simply extinguishing the flames doesn't stop the fire.**



## Managing lithium battery risks

Risk	What to do
<b>Charging Temperature</b> Extreme temperatures may affect battery longevity or could cause a fire. Lithium batteries could self combust at high temperatures. If the battery is too hot during or after charging, let it cool before using. High temperatures may cause battery under performance or even lead to a fire. Low temperatures could also damage your battery.	Charge your battery in the shade. Check your battery's temperature throughout charging and if it is too hot to touch, unplug the charger and allow the battery to cool down before use or continued charging. If your battery is too cold (10 degrees and below), wait until it is warmer to charge. Always check with your manufacturer on the correct temperature range to charge your batteries.
<b>Damaged batteries</b> To check for damage, look for crushing, puffiness, deformities, excessive heat, the wrong voltages, smell, and poor performance during use and after storage.	If your batteries are showing any of these signs, <b>we suggest you don't use them.</b> Dispose of them without delay and safely, using the manufacturer instructions as a guide.
<b>Incorrect Disposal</b> Disposal into general waste streams could result in fires at your premises and transfer stations or en route.	Because lithium batteries come in a range of forms, check with the manufacturer or your local battery disposal location for the correct way to dispose or recycle your specific battery. <b>We suggest you never dispose of batteries in household rubbish.</b>
<b>Using a battery in the wrong circumstances</b> A lithium battery cannot be used in extreme situations such as extreme temperatures, extreme overcharging, or extreme discharging. This will have a long-term effect on battery performance and may even result in a fire.	We suggest you keep to the original equipment manufacturer (OEM) specifications and instructions for optimal battery performance.
<b>Wrong charger</b> Lithium chargers work differently from standard battery chargers. Incorrect chargers can create unstable conditions inside the battery, which could result in a fire.	It is recommended you use the original equipment provided with the battery device or speak to the manufacturer if you need a replacement. We recommend you charge your lithium battery with the charger it came with. The output voltage and Ah rating of your battery should be matched by the charger.

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Risk	What to do
<p><b>First use</b></p> <p>Batteries can be faulty when fresh out of the factory.</p>	<p>It is recommended that you are particularly cautious with batteries on the first few charging cycles.</p>
<p><b>Repairing</b></p> <p>Lithium batteries cannot be repaired. If any damage is noted on the battery <b>stop using it immediately</b> and dispose of it carefully.</p>	<p>The best way to dispose of the battery is either:</p> <ol style="list-style-type: none"> <li>1. Take the battery to your local battery disposal location.</li> <li>2. Check with the manufacturer whether any recycling options exist near you.</li> </ol>
<p><b>Overcharging</b></p> <p>When the battery is charged for longer than recommended, it could damage the battery and lead to fire.</p>	<p>It is recommended that you use the original charger and monitor it whilst charging.</p>
<p><b>Over discharging</b></p> <p>In general, try to keep lithium batteries over the manufacturers recommended minimum state of charge because over discharging the battery could permanently damage it.</p>	<p>It is recommended that you use the original charger and monitor whilst using or discharging.</p>
<p><b>Overnight charging</b></p> <p>During overnight charging, there is a risk the battery could overheat and cause a fire.</p>	<p>A lithium battery should be charged under supervision.</p>
<p><b>Poor Storage</b></p> <p>In most circumstances, batteries need to be kept at a constant temperature of approx 20-35°C degrees* for optimum performance. High temperatures are not safe, low temperatures do not hold charges. Excess humidity and pressures could also damage batteries.</p>	<p>If you're storing lithium batteries long-term, you should consider using a balancing charger to apply a storage charge.</p> <p>In general, lithium batteries should be charged on a regular basis to keep them in good working order. Shelf discharge could irreversibly damage the battery.</p>
<p><b>Reverse Charging</b></p> <p>Lithium batteries cannot be charged by another battery as it can cause permanent damage.</p>	<p>It is recommended that you use the original charger and monitor whilst charging.</p>
<p><b>Short circuits</b></p> <p>Short circuits within the battery could cause permanent damage and can lead to a fire.</p>	<p>It is recommended that you use the original charger and monitor whilst charging and discharging.</p>
<p><b>Wrong battery for the application</b></p> <p>Not every battery is the same. When a battery is placed in a device not suited for it, the battery or device may be damaged, and could lead to a fire.</p>	<p>Always check the device's battery specifications.</p>

## We're here to help reduce your risk

If you have any questions, please get in touch by emailing [RiskConsulting@nzi.co.nz](mailto:RiskConsulting@nzi.co.nz) or speak to your insurance broker.



\*Please check with your manufacturer for your ideal storage method.

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