



Lithium battery fire safety guide for equipment



Lithium-ion batteries are a common source of power for equipment in commercial environments. While not inherently dangerous, they contain flammable materials and can pose fire risks if handled poorly. Therefore, it's important to understand how to safely use, store and charge them.

There are several fire safety considerations to keep in mind when using and recharging lithium-ion powered equipment such as forklifts, trolley jacks, patient lifts, and scissor-lifts, as well as personal mobility devices and e-cigarettes.

This guide details some of the important risks and controls associated with using this equipment including:

- ▶ Designated charging bays
- ▶ Avoiding fire spread
- ▶ Opportunity charging vs, on demand charging
- ▶ Management of your employee's personal mobility scooters / wheelchairs / e-bikes
- ▶ Parking / storage / charging

Lithium fires can be difficult to extinguish, your goal should be preventing the fire from spreading, if safe to do so, and calling FENZ (Fire and Emergency New Zealand) as soon as possible.

It is important to provide fire safety training to all employees working with or around lithium-ion powered equipment. This should include fire prevention, recognition of potential hazards, and proper response procedures in case of a fire.

By following these guidelines, you could significantly reduce the risk of fire damage at your business as a result of using and charging lithium-ion powered equipment in commercial buildings.

Always prioritise safety and ensure that everyone in the building is aware of the potential hazards and the appropriate safety measures.

Risk	Control
Damage to the equipment from overcharging	<p>When the battery is charged for longer than recommended, it could damage the battery and/or lead to fire.</p> <p>It is important to be vigilant. Avoid leaving batteries on continuous charge once they have reached their full capacity.</p>
Charging damaged equipment could cause a fire	<p><u>Regular Inspections and Maintenance</u></p> <ul style="list-style-type: none"> ▶ Conduct regular inspections of the charging equipment and batteries to ensure they are in good working condition. ▶ Replace damaged or malfunctioning components immediately. ▶ Remove damaged batteries immediately, and store in a non-combustible container, a minimum 10m distance from buildings. ▶ Install a reliable fire detection and alarm system in the charging area. Early detection is critical for responding promptly to any potential fire incidents. ▶ Do not leave equipment charging unsupervised. <p>Read Worksafe's guide on the correct installation of electrical chargers.</p>
Fire as a result of continuous charging	<p>Lithium batteries should always be charged under supervision.</p> <p>Overcharging can lead to overheating and potential fire hazards.</p> <p>Charge in a designated non-combustible bay (refer below).</p> <p>Avoid charging when site is unattended.</p>
Fire spreading to combustible material in the event of an unexpected fire	<p>If you are setting up charging bays in sprinkler protected buildings, consider extending your sprinkler protection to cover the charging bays.</p> <p><u>Establish a designated charging area</u></p> <ul style="list-style-type: none"> ▶ Preferably a separate fire cell (separated from the rest of the building with a 60/60/60 fire wall, this is a wall engineered to withstand a fire for 60 minutes). The area should be: <ul style="list-style-type: none"> – clear of flammable materials and combustible items. – The area should be fitted with handheld firefighting hoses that cover the charging area. These may be used to prevent fire spread when safe to do so. – well-ventilated to disperse any gases that may be released during charging or storage. – near an exit to facilitate rapid removal of equipment in the event of a fire (if safe to do so). ▶ Invite FENZ to review battery charging areas during your next site familiarisation visit e.g. critique area access and emergency separation of a burning battery. ▶ If you have multiple electric vehicles on your premises, they can become a large fire hazard if stored or charged together. Where possible space vehicles apart from one another.
Uncontrolled fire in engine bay	<p>There is limited access to large battery banks in vehicles, this means uncontrolled fires can spread rapidly.</p> <p>For large battery bays in commercial vehicles consider engine bay fire suppression devices which can be installed in the vehicle. These devices can give time for FENZ to arrive and fight the fire before it grows.</p>

Risk	Control
<p>Incorrect charging equipment can compromise the battery, damaging the equipment</p>	<ul style="list-style-type: none"> ▶ Use only reputable equipment suppliers. ▶ Follow original equipment manufacturers (OEM) guidelines when handling, charging, and replacing (damaged or end-of-life) batteries. <p>With the range of different battery types, equipment, and chargers on the market, it's important to understand how to correctly handle the batteries you have.</p> <ul style="list-style-type: none"> ▶ Provide fire safety training to all employees working with or around lithium-ion powered equipment. ▶ This should include fire prevention, recognition of potential hazards, and proper response procedures in case of a fire.
<p>Low quality equipment failing prematurely</p>	<p>Buying lower quality units usually means lower quality batteries and battery management systems which can cause equipment to fail prematurely and/or lead to fire.</p> <ul style="list-style-type: none"> ▶ Use only reputable equipment suppliers. ▶ Follow original equipment manufacturers (OEM) guidelines when handling, charging, and replacing (damaged or end-of-life) batteries.
<p>Shelf discharge could irreversibly damage the battery</p>	<ul style="list-style-type: none"> ▶ Vehicles/equipment should be stored in suitable designated areas. ▶ In most circumstances, batteries need to be kept at a constant temperature of approx. 20-35 degrees* Celsius for optimum performance. ▶ In general, lithium batteries should be charged on a regular basis to keep them in good working order.
<p>Extreme temperatures could damage the equipment and increase the risk of fires</p>	<ul style="list-style-type: none"> ▶ Always consider your charging environment for optimal battery management. ▶ Avoid charging batteries in extreme temperatures. Typically less than 0 degrees and greater than 60 degrees Celsius is considered extreme. ▶ Follow the OEM manual.

*Always check with your manufacturer for the recommended storage method.

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