

# Fire risk from Lithium-ion powered devices

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## **Fire risk from Lithium-ion Powered devices.**

### **Introduction.**

In accordance with its commitment to maintaining a safe and secure campus environment, and in recognition of the increasing prevalence of lithium-ion battery fires, the University has developed this procedure to promote a safe campus environment. This Procedure establishes clear guidelines for the use, storage, and charging of these devices on university property.

### **Scope**

This guidance applies to all students and staff who handle lithium-ion batteries in academic, research, and personal use.

### **Lithium-ion Battery Usage and Potential Hazards:**

Lithium-ion batteries are widely used across campus in personal electronic devices, research equipment, and e-mobility solutions due to their high energy density and portability.

Examples of devices containing lithium-ion batteries are:

#### **Personal consumer electronics.**

Devices used for personal communication, entertainment, and productivity. Examples like smartphones, tablets, laptops, digital cameras, smartwatches, and other wearable devices.

#### **Lithium-ion powered devices for work purposes**

Lithium-ion powered devices for work purposes, like cordless drills, saws, routers, and other power tools that benefit from their high energy density of lithium batteries. Cleaning equipment like cordless vacuum cleaners, and floor cleaners and audio-visual equipment like cameras etc.

#### **Electric mobility devices.**

Electric mobility devices like mobility wheelchairs, e-scooters, e-bikes, hoverboards, e-skateboards, e-unicycles, and similar devices.

#### **Electric Vehicles (EVs)**

Electric vehicles like electric cars and motorcycles.

**Note:** This procedure covers the devices commonly found on campus. It does not cover contractors or specialised equipment and large-scale energy storage installations, which require separate risk assessments.

These batteries pose a fire risk due to the potential for "thermal runaway," a rapid and uncontrollable increase in temperature that can lead to fire and explosion. This can be triggered by:

- overcharging.
- Physical damage (impact, puncture)
- Short circuits
- Exposure to extreme temperatures
- Manufacturing defects.

## **University Procedure**

### **Personal consumer electronics.**

Personal consumer electronics like smartphones, tablets, laptops, personal digital cameras, smartwatches, and other wearable devices can be allowed on Campus with the following caveats attached:

- It is strongly recommended that devices are not left unattended while charging.
- Use only manufacturers approved charging products.
- Charge devices on a flat stable non-flammable surface such as a table or desk.
- Avoid charging on soft furnishings.
- Assure adequate ventilation around the device during charging.
- Avoid charging in excessively hot or cold environments.
- Regularly inspect the items and cables for signs of frayed wires, cracked casings or swollen batteries. If there is any damage detected, discontinue use immediately and seek professional repair, replacement, or disposal.
- Avoid physical damage, protect from impact, drops and punctures.
- Charging cables should be arranged to avoid obstructing walkways or exits.
- Do not crush or bend the batteries.

### **Portable power tools.**

Where Lithium-ion micro-devices are University owned and are legitimately required for work purposes, for example, power tools, rechargeable audio-visual equipment and other lithium-ion powered devices, specific safety arrangements must be discussed and agreed with the Fire Safety Officer and suitable fire risk assessments and control measures are put in place. Line Managers have a responsibility to conduct risk assessment for all staff under their remit. Personal Tutors and Programme Leaders have responsibility for students within the University.

### **Electric mobility devices.**

Devices used by a disabled person such as mobility scooters and electric wheelchairs are not affected by this procedure. However, safe charging and storage practices should be followed where possible.

Due to the potential for fire and for the protection of our staff and students the University prohibits the storage or charging of privately owned e-scooters, e-

hoverboards e-skateboards, e-unicycles and similar Lithium-ion battery powered mobility micro-devices with attached batteries or the storage and charging of detached batteries for such devices within **any** University managed building and applies to **all** University of the West of Scotland issued accommodation contracts. We note that use of such devices on our campus is currently illegal and so is not permitted by the University.

E-bikes may be used on campus on roads and car park areas but should not be stored within any University operated building other than within an external Estates-designated bike storage area.

### **Legal position on use of e-scooters, mobility micro-devices and e-bikes**

The use of privately owned e-scooters and other powered micro-devices in a public place, including on roads and footpaths, is currently illegal in the UK. Although our campuses are private land, the public have unrestricted access and so our campuses are classed as public places. The University therefore does not permit the use of e-scooters or other powered micro-devices such as e-hoverboards, e-skateboards, e-unicycles, or similar devices on campus.

Use of e-bikes is legal within the UK and is allowed on the external areas of the campus provided they conform to legal standards. See the link for the UK Government guidelines. ([Riding an electric bike: the rules](#)) regarding maximum speed and pedal assistance.

**Disclaimer:** Legal information is for guidance only and does not constitute legal advice. It is the user's responsibility to ensure compliance with current regulations.

### **Electric Vehicles (EVs)**

Electric vehicles use large lithium-ion battery packs, which, while providing significant benefits, also introduce unique fire safety considerations. Therefore, the following guidelines should be adhered to:

#### **Charging Procedures:**

- **Use Approved Charging Equipment:**
  - Only use charging equipment that is compatible with your EV and has been certified by a recognised safety organisation.
  - Avoid using damaged charging cables or connectors.
  - Charging installations should be performed by qualified electricians.
- **Charging Location:**
  - Where possible, charge EVs in open, well-ventilated areas.
  - Avoid charging in enclosed spaces, such as tightly confined garages, unless proper ventilation and fire detection systems are in place.
- **Charging Practices:**
  - Follow the manufacturer's recommendations for charging procedures.

- Do not leave EVs charging unattended for extended periods, especially overnight, if possible.
- **Charging Infrastructure:**
- Ensure that any charging infrastructure installed, is done so by qualified professionals, and that it is regularly maintained.

## **2. Vehicle Maintenance and Inspection:**

### **Regular Servicing:**

- Have your EV serviced regularly by a qualified EV technician.

### **Battery Inspection:**

- Be aware of any signs of battery damage, such as:
- Unusual noises or odours.
- Excessive heat.
- Swelling or deformation of the battery pack.
- Any warning lights on the vehicle dashboard related to the battery.
- **Post-Accident Inspection:**
- Even minor collisions can damage the EV's battery pack. If your EV is involved in an accident, have the battery inspected by a qualified technician before further use.

## **3. Emergency Procedures:**

- **In Case of Fire:**
- If you suspect an EV battery fire, immediately move to a safe location and call emergency services.
- EV battery fires can be intense and difficult to extinguish; do not attempt to extinguish the fire yourself.
- Inform emergency services that it is an EV fire, as they require special procedures.

### **Vehicle Recovery:**

- EV batteries can re-ignite after a fire. Therefore, trained professionals should manage vehicle recovery.

## **4. Parking Considerations:**

- Where possible, park EVs in designated areas, away from combustible materials.
- Avoid parking EVs in close proximity to building entrances or exits.

### **Important Considerations:**

- EV battery technology is constantly evolving. Stay informed about the latest safety recommendations.
- Always refer to the EV manufacturer's guidelines for specific safety instructions.

### **Procedure review**

The University recognises that this is an area subject to ever evolving technical development which will influence the safety of these devices. As such, we will monitor emerging data relating to safety and review procedures accordingly. This procedure will be reviewed every three years or more frequently as needed.

### **Disposal of batteries**

Never put expired or damaged batteries in general waste or recycling bins. This is extremely important, as they can cause fires in waste collection trucks and recycling centres. Expired or damaged batteries should be reported to the Estates Services Support Officer via the Estates helpdesk.

### **Damaged batteries:**

Handle damaged or swollen batteries with extreme care. Wear appropriate PPE if available. If possible, place them in a non-flammable container, such as a metal container and take them to the campus external refuge area, or in London's case, contact Republic via the London Campus Manager.

Their locations are:

Paisley: Next to staff car park between the Gardener building and Robertson building.

Ayr: Service yard.

Lanarkshire: To the rear of the undercroft.

Dumfries: Service yard to the rear of Dumfries and Galloway College.

Contact the estates team via the [fmhelpdesk@uws.ac.uk](mailto:fmhelpdesk@uws.ac.uk) who will coordinate a safe uplift.

### **What to do if a Lithium-ion battery does go on fire**

#### **Prioritise safety:**

The most crucial step is to evacuate the area immediately and follow UWS's fire evacuation procedure.

Leave by the nearest exit, activating the nearest fire alarm call point to raise the alarm, encouraging those in the vicinity to also leave.

Make your way to the fire assembly point.

Lithium-ion battery fires produce toxic fumes, so avoid inhaling them. If you do inhale fumes, get to fresh air and seek immediate medical assistance.

Call emergency services 999, as quickly as possible and University security on 0141 848 3333

**Post fire:**

Do not enter the affected area until given the all-clear by the Fire Service.

Provide a witness statement to the Health and Safety team, detailing time of day, what you observed, any injuries and all other pertinent information.

**If Possible, Safely Isolate:**

- If it is a small device and it is safe to do so, try to isolate the device from flammable materials. However, do not put yourself in danger.
- If the device is plugged in, and it is safe to do so, unplug the device from the power source.

**Fire Extinguishers:**

Do not use standard fire extinguishers on a lithium-ion battery fire.

Use only specialist fire extinguishers if available and only if you have been trained to do so.

These are located:

- Paisley: Next to all EV charging points
- Ayr: Next to all EV charging points and, in the corridor, next to room 2.001.
- Lanarkshire: Next to all EV charging points.
- Dumfries: Next to all EV charging points.

**Thermal Runaway:**

Be aware that lithium-ion battery fires can reignite even after they are extinguished. Continue to monitor the battery and cool it with water if possible.

**Professional Help:**

Always allow trained firefighters to handle lithium-ion battery fires whenever possible.

**Prevention is Crucial:**

To minimise the risk of lithium-ion battery fires, follow these precautions:

- Use only reputable chargers and batteries.
- Avoid damaging or puncturing batteries.
- Do not overcharge devices.
- Store batteries in a cool, dry place.
- Do not leave charging devices unattended.

By following these guidelines, you can help protect yourself and others in the event of a lithium-ion battery.

### **Further advice**

Scottish Fire and Rescue Service advice on e-scooter and e-bike safety. (See link below.)

[Scottish Fire and Rescue Service advice on e-scooter and e-bike safety](#)

### **Definitions.**

**Lithium-ion Battery:** A type of rechargeable battery that uses lithium ions as a key component of its electrochemistry.

**Thermal Runaway:** An uncontrollable, self-accelerating increase in temperature of a battery, which can lead to fire or explosion.

**E-mobility Device:** A personal transportation device powered by an electric motor, typically including e-scooters, e-bikes, hoverboards, e-skateboards, and e-unicycles.