

## LITHIUM BATTERIES

With the increased use and availability of lithium batteries across the University, it is important that suitable procedures are implemented in regards to the procurement, use, charging, transporting and storage of these batteries, in order to reduce the associated risks.

This guidance covers all types of equipment that contain lithium batteries including:

- General guidance for small equipment and devices containing routine everyday domestic type battery items (e.g. mobile phones, portable chargers, laptop computers, e-cigarettes, cordless tools / equipment, cameras etc).
- Specific requirements for lithium batteries in laboratories and workshops (lithium-polymer and larger lithium-ion batteries) used in items such as drones, robotics, formula cars and other large equipment.

### HAZARDS

If a battery cell creates more heat than it can effectively dissipate, it can lead to a rapid uncontrolled release of heat energy, known as a 'thermal runaway'. This can result in fire or explosion, and may occur as a result of manufacturing defects, mechanical damage, exposure to heat and overcharging / over-discharging.

### SIGNS OF FAILURE

There are several indicators that a battery could be beginning to fail:

- Excessive heat
- Unusual smells
- Discoloration of the battery casing
- Bulging or swelling of the battery pack
- Smoke release
- Unusual noises such as cracking or hissing
- Poor performance of a device

## ACTIONS TO BE TAKEN UPON FIRE

Portable fire extinguishers **WILL NOT** extinguish a lithium battery fire. Do not attempt to tackle a fire involving lithium batteries. In the event of such a fire, you should activate the fire alarm at your earliest opportunity and evacuate the building in accordance with University procedures.

## GENERAL USE

- Only use batteries that are CE, UKCA, BSI kite marked or of an appropriate standard.
- Always inspect batteries for any signs of damage before use and never use damaged or defective batteries.
- Never modify a battery (unless it is designed to be modified and only done by a competent person)
- Do not store, charge or use batteries in direct sunlight or near sources of heat.
- Do not use batteries in extremes of temperature (see manufacturers guidelines).

## CHARGING

- Only charge batteries with a suitable OEM (original equipment manufacturer) or compatible charger.
- Battery charging is safest when done with supervision (i.e. not overnight).
- Charging area needs to be kept clear of flammable/combustible materials.
- Batteries must never be charged in corridors or fire escape routes.
- Where possible, avoid overcharging batteries. Ideally batteries should be charged to 80%-90%, unless stated otherwise.
- Disconnect the device when it's charged and unplug the charger.

## DISPOSAL

Lithium batteries must never be placed in internal battery bins or external bins. Please contact the Estates helpdesk ([estates.helpdesk@port.ac.uk](mailto:estates.helpdesk@port.ac.uk)) to arrange disposal.

These disposed batteries will be stored in a dedicated lithium battery metal safe within the Port Royal Street compound, until our waste contractor removes them from site for recycling/disposal.

For the disposal of batteries within University managed services equipment (i.e. laptops and phones), Library and Information Services (IS) also need to be informed via the Service Desk to ensure the appliance is disposed of in accordance with GDPR.

## ADDITIONAL REQUIREMENTS FOR LITHIUM BATTERIES IN LABORATORIES AND WORKSHOPS

### RISK ASSESSMENT

All battery use that falls into this category must be covered by risk assessment and reviewed by the Fire Safety Manager. In addition to the general use requirements above, the following criteria **MUST** be met:

### CHARGING

- Charging must never take place overnight.
- Charging must take place within a bespoke enclosure such as a proprietary metal battery storage cabinet, fireproof cabinet or fireproof safety bag (Li-Po charge bag) unless agreed otherwise with the Fire Safety Manager.
- A charge log should be kept, where determined by risk assessment or other legislation.

## CHARGING FACILITIES

- The room must be identified in writing to the Fire Safety Manager for approval.
- The room must be fitted with automatic smoke detection.
- The room must be a single compartment (minimum of 30 minutes fire resistance) fitted with self-closing FD30S (minimum) fire doors, unless otherwise agreed by the Fire Safety Manager.
- The room must have either an external means of isolating the power supply or the charging socket should isolate upon the activation of the building fire alarm (battery dependant as identified by risk assessment).
- Suitable fire-fighting equipment must be readily available, in order to facilitate escape.
- No gas pipes are to be present in the room, unless otherwise agreed by the Fire Safety Manager.
- Signage must be provided, as identified via risk assessments.

## STORAGE FACILITIES

- The room must be identified in writing to the Fire Safety Manager for approval (if different from the charging facilities).
- Remove batteries from equipment when storing.
- Batteries should be stored in a bespoke enclosure such as a proprietary metal battery storage cabinet, fireproof cabinet or fireproof safety bag.
- It is recommended to store batteries at around 40%-50% charge, for long term storage.

## TRANSPORTATION

- All batteries should be transported in line with manufacturers guidance.
- All batteries being transported in any vehicles for University business should be carried in lithium battery fire bags.