UNIVERSITY OF
NORTHERN COLORADO

Environmental Health and Safety

PERSONAL ELECTRIC DEVICE

and

LITHIUM BATTERY

SAFETY PROCEDURE

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Personal Electric Device
And
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And
Lithium Battery Safety Procedure

I. Purpose

The intent of this procedure is to provide requirements for Personal Electric Devices (PEDs) and Lithium batteries. This document applies to all students, faculty, staff, and visitors on University of Northern Colorado (UNC) property. It is the users' responsibility to know the established procedures for the use and safe operation of PEDs, as well as storage, charging, use, and disposal of lithium batteries.

The purpose of this procedure is to promote safety on the University campus while permitting the use of PEDs. Users assume all risks associated with the operation of these devices on the UNC campus.

Caution must be taken in lithium battery storage, charging, use, and disposal due to the potential for fire and injury if these batteries are misused or damaged. There have been several incidents related to lithium batteries left on chargers for extended times, unattended charging, incompatible chargers, cheap knock-off batteries, and shorts from improperly wired or isolated connectors.

II. Definitions

University of Northern Colorado campus: includes any property owned, leased, or controlled by the University, including sidewalks, walkways, buildings, grounds, parking lots, structures, athletic and recreation facilities, and streets.

Personal Electric Device (PED): Electric or motorized scooters, electric skateboards, hoverboards, motor-assisted pedal bicycles, and similar items used for personal transportation. *Personal Electric Devices designed for and used to accommodate persons with mobility restrictions should be reviewed by the University Disability Resource Center (DRC) for use (storing, charging) inside campus facilities (i.e., Residential Facilities/Housing). Users of these devices must follow all procedures outlined in this document unless otherwise approved by DRC through an interactive process. Requests for accommodation should be directed to DRC at 970-351-2289 or DRC@unco.edu.*

Lithium: In this procedure, lithium includes lithium-ion battery and lithium-ion polymer cells.

III. General Procedure for PEDs

A. Operation

- PEDs may not be operated inside any University building.
- PEDs may be carried or walked inside a University building if exterior storage is not available.
- PEDs that are temporarily carried indoors must not be parked or stored in any manner that blocks access to entrances or exits to buildings including, stairways, or hallways of any University building, including residence halls, as well as aisles or walking paths in classrooms and office space, nor should these items be stored in common areas such as lounges, lobbies, study rooms, etc.
- The use of cell phones, tablets, or any other electronic device which may serve as a distraction is prohibited while operating a PED.
- PEDs are to be used for mobility purposes only. Racing, stunts, and trick riding are prohibited on the University of Northern Colorado campus.
- PED operators shall be mindful of their safety, the safety of others, and shall be alert to pedestrians and other vehicles. PED operators shall exercise due care and reasonable caution to prevent collisions, injury to others, injury to self, or damage to property.
- To minimize the risk of personal injury and property damage, PEDs may not be present anywhere on the University of Northern Colorado campus unless the battery bears the seal of an independent testing laboratory accredited by the Consumer Product Safety Commission. (Example: UL Listed, TÜV SÜD certification mark)
- The maximum speed at which a PED may be operated shall not exceed that which is posted for vehicular right-of-way or five miles per hour in pedestrian areas and sidewalks, whichever is lower.
- Pedestrians always have the right of way. PED operators must yield to pedestrians in walkways and sidewalks and provide audible or hand signals when approaching or passing pedestrians. PED operators should use the bike path/lane whenever available.
- PED operators must obey all applicable municipal laws and university regulations concerning traffic and bicycles on campus.
- PEDs being charged should not be left unattended.
- Storing, charging or use of approved PEDs in campus housing (including residence halls, houses, and apartments) is dictated by the Housing and Residential Education Handbook.
- The charging of PEDs in any University academic or administrative building, or athletic facility is discouraged. At no time may PEDs be charged in classrooms, hallways, or common areas.
- The owner and/or operator of a PED is liable for any injuries or damages arising out of the presence, operation, or use of the PED while on the University of Northern Colorado campus.

B. Parking Requirements

PEDs shall not be parked in the following areas on UNC campus:

- on turf or flowerbeds, or tied/locked to trees,

- on a street or in a bike lane, or in any other location that impedes the flow of vehicular or pedestrian traffic, including parking lots,
- at the top or bottom of any stairs or steps,
- in any manner that would impede ADA access,
- adjacent to or affixed to structures, architectural elements, or artwork including but not limited to handrails, fences, benches, light poles, sign poles, sculptures, etc.,
- in a manner that causes damage to UNC property.

IV. Lithium Battery Guidelines

Proper lithium battery charging, storage, and handling is critical for maintaining battery performance and reducing the risk of fire and/or explosion. Incidents regarding lithium battery fires have been reported due to inadequate charging and storage conditions. Spontaneous fires involving these batteries are rare, but an internal short circuit can start a series of reactions that may lead to a fire. An exploded battery can result when overheated or mechanically damaged. In the event of an explosion involving a lithium battery, the room can fill quickly with dense white smoke that can cause severe irritation of the respiratory tract, eyes, and skin.

Lithium batteries and devices that contain lithium batteries shall not be operated, charged and/or stored anywhere on the University of Northern Colorado campus unless the battery bears the seal of an independent testing laboratory accredited by the Consumer Product Safety Commission. (Example: UL Listed, TÜV SÜD certification mark) Such certification, logo, or name of an accredited laboratory shall be displayed directly on the battery for the device.

The following information will provide guidance for charging, storage, handling and disposing of lithium batteries.

A. Charging

- Follow all safety instructions provided by the manufacturer.
- Never leave a battery pack unobserved during charging. Always stay in the charging location so that you can check for signs of battery or charger distress.
- Remove lithium batteries from chargers immediately after charging is complete.
- Never burn, overheat, disassemble, solder, puncture, crush, or otherwise mutilate battery packs or cells.
- Keep batteries away from water.
- Do not mix different types of batteries during use and recharging.
- Avoid hot and humid conditions (e.g., steam sources, ovens, furnaces, and other heat producing equipment).
- Do not charge batteries in direct sunlight, on hot surfaces, or in hot locations.
- Keep batteries and chargers away from flammable and ignition sources.
- Immediately disconnect the batteries if, during operation or charging, the batteries become overheated, emit an unusual smell/odor, or change shape/geometry.
- Batteries must only be charged with a charger or charging method designed to safely charge cells or battery packs at the specified parameters. Be absolutely sure that the charger settings are correct for the battery pack being charged – both voltage and current settings.

- Chargers should be plugged directly into wall receptacles without the use of extension cords.
- Make sure that batteries do not exceed manufacturers recommended operating temperatures during charging or discharging.
- Use caution if charging a battery that is still warm from usage or using a battery that is still warm from charging.
- Special charging equipment will be needed for bulk charging.

B. Storage

Proper lithium battery storage is critical for maintaining optimum battery performance and reducing the risk of fire and/or explosion. The following are some guidelines that, if followed, will reduce the risk of fire and/or explosion of stored lithium batteries:

- Store batteries away from combustible materials.
- Do not place batteries in direct sunlight, on hot surfaces, or in hot locations.
- Remove batteries from the device for long-term storage.
- Store the batteries in a well-ventilated place at room temperature or lower.
- If practical, store batteries in metal storage cabinets.
- Visually inspect battery storage areas at least weekly.
- Charge batteries in storage to approximately 50% of capacity at least once every six months. Charge or discharge the battery to approximately 50% of capacity before long-term storage.
- The ideal surface for storing lithium batteries is concrete, metal, ceramic, or any non-flammable material.
- Batteries can be stored in a metal cabinet such as a chemical-storage cabinet; make sure that batteries are not touching each other.
- Avoid bulk storage of lithium batteries. If bulk storage is needed, contact EHS. Special storage containers will be required.

C. Handling and Use

- Handle batteries and or battery-powered devices cautiously to not damage the battery casing or connections.
- Inspect batteries for any signs of damage before use.
- Keep batteries from contacting conductive materials, water, strong oxidizers, and strong acids.
- Inspect batteries for signs of damage before use. Never use and promptly, properly dispose of damaged or puffy batteries.
- Keep all flammable materials away from the operating area. Allow time for cooling before charging a battery that is still warm from usage and using a battery that is still warm from charging.

D. Disposal

- Properly dispose of damaged lithium batteries that no longer hold a substantial charge or are bulging.

- Lithium batteries cannot go in the general trash.
- Do not mix lithium batteries with other types of batteries, such as alkaline, cadmium, or other rechargeable spent batteries.
- UNC lithium batteries can be collected by Environmental Health and Safety (EHS) for recycling through the Universal Waste Management Program. Submit a Facilities Management work request to schedule a pickup.

V. Laptops and Similar Devices

Lithium batteries found in laptops, cell phones, and similar devices usually, if from a reputable manufacturer, require no user input for charging other than connecting it to the provided charging cable. They contain a Battery Management System (BMS) in the battery pack that controls the charging process. The following guidelines should be followed:

- Use the supplied charging cable and AC adapter from the manufacturer.
- Do not use if there are any signs of damage to the charger or power cord.
- Do not use if the battery shows signs of damage such as heating, discoloration, deformation, bulging or swelling.
- Follow all manufacturer recommendations and be alert for anomalies like unusually hot batteries.

VI. Emergency Procedures

Follow these steps if there is evidence of a battery malfunction or damage (e.g., swelling, heating, or irregular odors).

- If batteries are showing evidence of thermal runaway failure, be very cautious because the gases may be flammable and toxic and failure modes can be hazardous.
- Disconnect the battery (if possible)
- Remove the battery from the equipment/device (if possible)
- Place the battery in a safe location free from combustible materials (i.e., metal container) (if possible)
- Contact UNC Police at 970-351-2245

<u>In the event of an exploded cell</u>

- Evacuate all personnel from the area
- Secure the area so no unnecessary personnel may enter
- Contact UNC Police at 970-351-2245

<u>In case of a Fire</u>

- Activate the building fire alarm system
- Evacuate to a safe area
- Dial 911 from a campus phone or 970-351-2245
- Attend to any person that has been exposed to the materials, if safe to do so.