Electrical Safety – Guidance on the use of Electrical Equipment

Electrical equipment, when used improperly or without proper certification, can pose hazards such as fire, electrical shock, etc. According to the Ontario Electrical Safety Code Rules 2-022 and 2-024, all electrical equipment must be certified before use in Ontario to ensure that the equipment is safe to use.

Employers have a duty under section 25(2)(h) of the Occupational Health and Safety Act (OHSA) to take every precaution reasonable in the circumstances for the protection of a worker.

Fire is a potential hazard when using electrical equipment or wiring incorrectly.

Recognized Certification Markings

All electrical equipment must meet Canadian national safety standards and provincial codes and be certified by an accredited certification body such the Canadian Standards Association (CSA), the Underwriters Laboratories of Canda (ULC), etc.

Bureau Veritas Canada (Formerly known as Curtis Straus LLC)			
Canadian Group for Approval Inc. (CGA)			
Canadian Standards Association (CSA)			
DEKRA Certification BV			

A few examples of accepted certification markings. For a full listing, please refer to Electrical Safety Authority (ESA) webpage.

For research or learning activities, in the rare and unique situation where there is a need to use electrical equipment that does not have the above accredited certification, the instructor or Principal Investigator (PI) should conduct a risk assessment, in consultation with the local facilities group and EHS. Approval is required from the Chair. **In general, the requirement is for departments to use certified equipment or apply for the appropriate certification.**

General Electrical Safety Tips

- DO NOT leave heat-producing electrical products unattended. Turn equipment off and unplug when not in use.

- DO NOT place heat-producing electrical products (e.g., portable electric heaters, irons, toasters, coffee makers or tea kettles, etc.) close to combustibles or other materials (e.g., paper, plastic bins, etc.).
- Always read the manufacturer's instruction manual for your electrical product for appropriate usage details and to determine the acceptable distance between the product and combustible materials.
- Keep electrical products (including cords) dry, away from water and path of travel. Electrical equipment designed for outdoor and wet areas should have 3-prongs and be connected to an electrical receptacle with a ground fault circuit interrupter (GFCI) per Ontario Building Code. Ontario Building Code requires GFCI for all outlets within 1 metre of a sink.
- Large appliances should have a dedicated receptacle, e.g., fridge, microwave. Consult with your local facilities group.
- DO NOT leave portable electronic devices on soft surfaces that can prevent heat dissipation and block a device's ventilation (e.g., upholstered chair, desk accessories like mouse pad, couch, bed, etc.), especially when they're being charged as they can overheat or even start a fire. This includes laptops, mobile phones and any other device containing lithium-ion batteries (e.g., chargers).
- Ensure that a minimum 1 metre (39 inches) clearance is maintained from the face of electrical panels per Ontario Electrical Safety Code, Section 2.308.

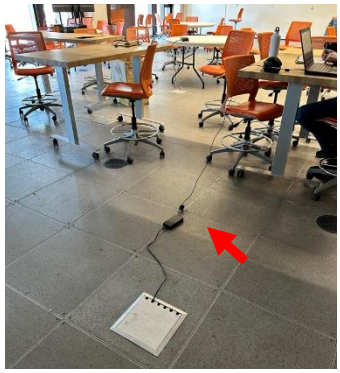
Power Bars and Extension Cords

- Connect power bar/extension cords directly to the wall outlet. DO NOT connect 2 or more power bars/extension cords together (known as 'daisy chaining') as this can overload a circuit and increase the risk of electrical hazards (i.e., overheating or fire)
- Read the directions for your electrical product to see if it is safe to use with an extension cord or power bar:
    - Check to see if the cord is rated for the electrical product in use; the rating will indicate the power, voltage and current.
    - The power cord should be able to safely supply electrical power in accordance with the product's electrical needs.
    - Only use certified surge-protected power bars.
    - Power bars should only be used with low wattage appliance (e.g., computers) and not high wattage appliances (e.g., fridge, microwave, coffee makers, etc.).
    - Power bars should be properly supported to avoid loose connections (overheating, etc.)
- Unroll cords completely before use to avoid overheating.
- Use the proper rated indoor and outdoor cords for electrical products based on environment usage.
- Pull on the plug and not the cord when disconnecting an electrical product; this is to avoid damaging the cord, loosening the connection or causing potential electrical hazard.
- Check cords regularly on electrical products for fraying or damage that may pose an electric shock or fire hazard. Discard or replace worn or distressed cords and plugs. Be aware of any unusually warm or hot outlets or cords; unplug any cords or extension cords from these outlets and contact your local facilities group.

- DO NOT cover extension/power cords except in accordance with the manufacturer's instructions. To help prevent overheating and damage, extension cords should **not**:
  - run through walls, doors and ceilings
  - run under rugs
  - used to support heavy objects
  - used as fixed (permanent) wiring
  - permanently secured, such as stapled
  - run behind or on radiators, baseboards, or other sources of heat.
- DO NOT remove the ground prong of a plug because this prong reduces the risk of electric shock.
- DO NOT use 3-prong to 2-prong adapters, sometimes known as cheater plugs, because this is similar to removing the third prong of a plug.
- DO NOT use light socket modifiers for outlets.

Floor outlets

- Ensure that the floor outlet cover is closed flush with the floor level.
- Do not band or twist cords inside the outlet box.
- Keep long cables neatly organized on the level of the desk/bench rather than on the floor.
- Avoid stepping or rolling chairs over the floor power box as it can cut or pinch the electrical cords/cables plugged in.
- When plugging items into floor-based outlets, consider if it will be a trip hazard. Where feasible and safe to do so, position moveable furniture over by the floor-mounted outlets or directly above them, creating a sheltering effect from high traffic, rolling over or stepping on floor outlets and cables.
- Where available, consider using the desk-mounted extension when more items need to be connected to the number of outlets inside the floor-mounted electrical box.
- If needed, relocate the floor outlet to a low-traffic area, such as under the benches or by the windows and walls.



Potential trip hazard

Damaged cord

Chargers

Make sure to use the charger that is compatible with your laptop, mobile phone, or any other product that has a rechargeable battery. Learn more: precautions for charging your lithium-ion battery.

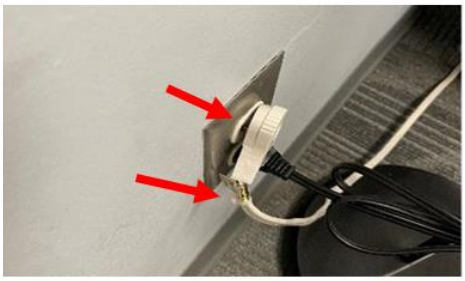
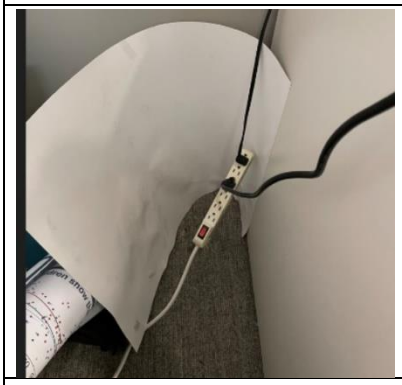
Portable space heaters

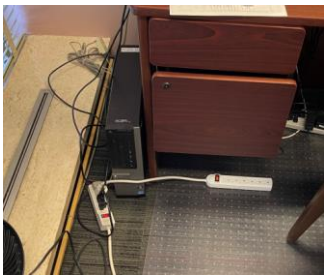
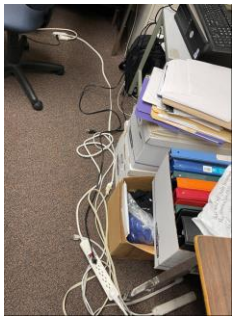
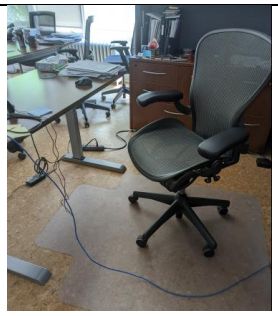
Electric space heaters, when used properly, can provide temporary comfort over and above a facility's heating system. Unfortunately, with the use of these heaters comes the increased risk

of fire, potential injury and can overload the electrical system. A portable electric space heater should only be used as a temporary solution. Please review the guidance/precaution below:

- Contact your local facilities group for temperature issues (UTM, UTSC, UTSG) before purchasing a heater.
- Use portable electrical heaters with a thermostat to automatically shut down the unit when the desired temperature is achieved.
- Use portable electric heaters with a low centre of gravity and equipped with Tip Protection (a mechanism whereby the heater shuts off automatically when tipped over).
- Inspect heaters and cords before use. Users are responsible for reviewing manufacturer information and following manufacturer's instructions for inspection and maintenance. Portable electric space heaters found to be in poor operating condition, damaged, or used improperly, shall be turned off, unplugged, and replaced.
- Portable electric space heaters shall be plugged directly into an electrical outlet. The use of extension cords is strictly prohibited.
- Heaters should only be in operation while attended. Turn off and unplug when not in use, and at the end of each business day.
- Portable electric space heaters shall be placed in a well-ventilated area at least three (3) feet from any combustible material (e.g. curtains, paper, clothing, etc.).
- Portable electric space heater cords must never be run under carpets and/or rugs. Non-combustible/flammable cord covers can be used to reduce tripping wire hazards.
- Portable space heaters are not permitted in laboratories of any kind – at any time. If an exception is required, please contact your local facilities group (UTM, UTSC, UTSG) and EHS (ehs.office@utoronto.ca). The use of any portable heater that is fueled by kerosene or propane, or that produces open flame, is strictly prohibited. Only electric plug-in space heaters are permitted.
- DO NOT place in enclosed areas, underneath desks, in any means of egress (exit path), or any high traffic area.
- DO NOT use heaters in wet areas like bathrooms and kitchens.
- DO NOT use heaters in areas if small children are expected.
- Open coil space heaters are not permitted.

Examples of Unsafe Electrical Practices

	White cord is not properly connected outlet; damaged wiring.
	Power bar not supported (potential for loose connection), hanging in mid-air. Combustible materials (paper) nearby.
	Power bar connected to high wattage appliances (microwave and coffee maker). Power bar cord running inside furniture; potential for damaging cord when closing the cabinet door.
	Power bar entangled with lamp post: potential tipping hazard. Power bar hanging mid-air: potential for poor connection at the plug. Power bar used for high wattage equipment (kettle).

	Power bar used for high wattage equipment (microwave). Power bar cord: trip hazard.
 	Power bar connected to another power bar (i.e., daisy chaining). Cords should also be tucked away to prevent a trip hazard.
 	Cords: trip hazard.