
Electrical Safety in the Laboratory

The hazards associated with the use of electricity include electrical shock and electrical fires caused by shorts and overloaded circuits or wiring. In addition, sparks from electrical equipment can serve as an ignition source for flammable or explosive vapors or combustible materials. Most incidents are a result of unsafe work practices, improper equipment use, and faulty equipment. Adherence to the following work practices and procedures can significantly reduce the electrical hazards one might encounter in the workplace and ensure compliance with OSHA regulations:

- Know the location of electrical panels and disconnect switches in or near your laboratory so that power can be quickly shut down in the event of a fire or electrical accident. To enhance safety, post the location of the electrical panel on the equipment it services.
- Never obstruct electrical panels and disconnect switches. These should be clearly labeled to indicate what equipment or power source they control. A minimum 3-foot clearance must be always maintained around electrical panels to permit ready and safe operation and maintenance of such equipment.
- Do not overload circuits or wiring. Overloading can lead to overheated wires and arcing, which can cause fires and electrical shock injuries.
- Inspect all electrical equipment (e.g., hot plates, stirrers, ovens, extension cords, etc.) before use to ensure that cords and plugs are in good condition (i.e., not worn, twisted, frayed, abraded, corroded, or with exposed wires or missing ground pins). Live parts must be effectively insulated or physically guarded. Equipment with damaged or defective cords or plugs must be taken out of service immediately and repaired by qualified personnel.
- Ensure that all electrical outlets have a grounding connection requiring a three-pronged plug. All electrical equipment should have three-pronged, grounded plugs or be double-insulated.
- Electrical outlets, wiring, and other electrical equipment integral to the building may only be serviced and repaired by Facilities Operations qualified trades personnel or other qualified electricians.
- Work on electrical equipment must only be done after the power has been disconnected. For cord and plug connected equipment, the power cord must be unplugged and under the exclusive control of the person performing the work so that the equipment cannot be accidentally turned on by someone else. For hard-wired equipment, the main disconnect device or circuit breaker must be shut off and locked and tagged with a special padlock and tag.

Service and/or repair work on hard-wired equipment may only be conducted by authorized individuals who have received EHS Lockout/Tagout training.

- Limit the use of extension cords—they are for temporary, short-term use only. In all other cases, request the installation of a new electrical outlet. Do not use extension cords as a substitution for fixed receptacle outlets. Long-term use of extension cords is a violation of OSHA regulations. The long-term use of multi-outlet power strips is also illegal, except for use with computer equipment.
- Ensure that all extension cords used are carefully placed, visible, and not subject to damage. Cords must not run across aisles or corridors where they might be damaged or create a tripping hazard. Cords must not run through doors, walls or partitions, under rugs, or above dropped ceilings. They must not be tied in knots, draped overhead, or attached to walls.
- Ensure that the wire size of an extension cord is adequate for the current to be carried. Failure to do so can lead to electrical fires. Cords used for 110-120 volts must be UL listed with a polarized three prong plug. Extension cords must never be linked together—use the proper length extension cord needed for the application.
- Keep corrosive chemicals and organic solvents away from electrical cords—these can easily erode the insulation on wires.
- Keep flammable materials away from electrical equipment.
- Keep electrical equipment away from wet or damp locations or potential water spillage, unless specifically rated for use under such conditions.
- Never handle electrical equipment when the hands, feet, or body are wet or perspiring or when standing on a wet floor.
- In the event of an electrical fire, evacuate the area, call 911, and pull the nearest fire alarm. Never use water on an electrical fire. If safe and feasible, shut down the main power source.
- In an electrical emergency, if a person received an electrical shock, do not touch the equipment, cord, or person. Call 911 to alert the Fire Department to treat the injured person and evaluate the situation. If safe and possible, shut down the main power source.

For more information, see the [Electrical Safety Program](#) or contact [Environmental Health and Safety](#).