

Electrical Safety in the Lab

Electrical equipment, cords, and outlets must be in good shape and used properly.

Hazards

There are about 70 fatalities per year associated with commercial electrical products – light switches, outlets, extension cords, and other equipment. An electric shock can cause severe burns, muscle contractions, and may even stop the heart. Wires carrying electricity can generate heat resulting in fires, burns, and other damage.

Selecting the Proper Equipment

- Review the Lab Equipment Purchasing guidelines at <https://facilities.umn.edu/our-services/lab-equipment-purchasing>
- Use only industrial/commercial rated equipment listed by a Nationally Recognized testing laboratory such as TUV or UL. “Residential use” equipment should not be used in research areas unless that is the only type available. The rating will be printed on the equipment, written on the packaging, or on a tag attached to the equipment.
- If the equipment may be used in potentially wet or moist conditions, it must be properly rated for those conditions. “Outdoor use” vs “Indoor use”
- If using in areas where flammable vapors may be present (i.e., pouring solvents such as acetone or ethanol), ensure equipment is rated as intrinsically safe.
- Do not use outlet adapters (3-prong to 2-prong), as this bypasses required safety features. Removing the grounding prong of plugs is forbidden.
- Always follow the manufacturer’s instructions for installing all electrical equipment. Make sure you are using the appropriate power in order to prevent overloading circuits. (Example: don’t use a 100 watt bulb in a fixture that says the max wattage is 60 watts)
- Do Not “daisy chain”, or plug one a power strip into another power strip. This increases the resistance of the electrical circuit, causing more heat to be generated and possibly causing a fire.
- Maintain all equipment in its original approved condition. Covers on electrical equipment must remain in place. Do not use damaged equipment or outlets. “Jury rigging” or DIY electrical installations or equipment are not allowed. Cords should not be duct-taped or repaired.
- If you need more outlets, need to move equipment, or would like to tap into electrical panels/circuits (i.e., for a permanent hard-wired installation), contact Facilities Management (FM) to get assistance.



Ground Fault Circuit Interrupters (GFCIs)

GFCIs are devices that reduce the risk of electric shock, as they shut off electrical power when they detect that current is not equal between input and output. This means that current is flowing somewhere it shouldn’t, such as through water or a person. The GFCI reacts by shutting down electrical power. These outlets must be used anywhere that is within 6 feet of a water like a sink, faucet or wet location like greenhouse, garage or outdoors. Contact FM if you need a GFCI outlet installed.

GFCI outlets should be tested monthly by plugging a device into it, turning it on, and then pressing the “TEST” button on the outlet. The device should stop running as power is cut off. Extension cords with a GFCI built in are also available. These are good to use in damp or wet areas.



Protect electrical components

- Keep original shields, guards and covers on electrical equipment
- All electrical equipment and connections should be kept off the ground in case of unexpected water.
- Keep electrical equipment away from corrosive chemicals and solvents. These can erode the insulation on wires and cords.
- Secure electrical equipment away from pinch or friction points like cabinet doors.
- Do not run electrical cords through doorways. If cords must go across a walkway, get a cover.

Protect yourself

- Always wear shoes and dry off your hands before handling electrical equipment. Do not handle electrical equipment when your hands, feet, or body are wet. This includes sweating, or standing on a wet floor.
- Make sure equipment is dry before plugging it in. Be especially aware of this when removing equipment from the cold room or other chilled or outdoor areas. Condensation may cause moisture to be present.
- Grab the plug with your right hand only to prevent any potential shock going across your heart.
- If someone is moving involuntarily, it may not be possible for them to “let go”. Do NOT touch them or you could also become part of the circuit. Shut off power and use non-conducting material to knock them free.
- Never walk into a flooded space until the power is off.

Access to Electrical Panels

Electrical Panels must be accessible at all times. Maintain a 3 ft clearance in front of electrical panels.

Working Around Exposed, Energized Conductors and Parts

There are highly specialized training requirements for any person who works with or around parts or conductors that are exposed and energized and greater than 50 volts. This might include people who perform installation, service or maintenance on electrical equipment. This might also include employees who work within 10 feet of overhead power lines or underground installations. Please consult with University Health and Safety if you believe this requirement applies to you or others in your area.

Lockout/Tagout

If your job involves services or maintaining (i.e., installing, setting up, clearing jams, repairing, etc.) machines or equipment which are capable of starting or becoming energized during that work, then you must follow proper lockout/tagout procedures to make sure the equipment is placed into, and remains in a safe state during the work. Specialized lockout/tagout training is required for employees who do this work. Never try to remove a tag or lock that is not your own.

