

## **SAFE OPERATING PROCEDURE LABORATORY ELECTRICAL EQUIPMENT**

### **Introduction**

Electrically-powered laboratory equipment is indispensable for laboratory operations. Heating mantles, magnetic stirrers, rheostats, vacuum pumps, X-ray units, lasers, and hot plates represent just some of the equipment that can pose an electric shock, explosion, or fire hazard if used improperly.

### **Installation and Inspection**

**Installation of hardwired equipment must be performed by a licensed electrician.**

All electrical equipment must be certified by a nationally-recognized testing laboratory (such as FM or UL) to ensure that the equipment is free from reasonably foreseeable risk due to electrical hazards. Electrical equipment must not be modified unless explicitly approved by the manufacturer, or inspected by an electrical inspector before being placed in service.

As a minimum, the electrical inspection must insure that:

- Equipment is sufficiently enclosed to prevent accidental contact with energized parts.
- Exposed metal parts are bonded and grounded.
- Over-current protection is appropriate for intended use.
- Connections are tight and insulation intact.

In addition, a competent person within the laboratory should regularly inspect electrical equipment. These visual and physical inspections are to include:

- Obvious damage or defects in the accessories, connectors, plugs, or sockets.
- Flexible cords are effectively anchored to equipment, plugs and sockets.
- Damage to flexible cords:
  - the inner cores of flexible supply cords are not exposed or twisted;
  - the external sheaths are not cut, abraded, twisted, or damaged to such an extent that the inner cores are visible.
- Warning indicators for maximum load on power strips are intact and legible.
- Controls are in good working order, in other words, they are secure, aligned, and appropriately identified.
- Covers and guards are present and secured.
- Ventilation inlets and exhausts are unobstructed.

If upon routine inspection any of the above flaws are detected, the electrical equipment should be immediately removed from service. Contact the equipment vendor, a qualified electrical repair organization, or the Electrical Shop for repair information.

### **General Safety**

All electrical outlets within 6 feet of water must be protected by ground fault circuit interrupters (GFCI). Contact the Electrical Shop to have this protective circuitry installed.

Avoid the use of extension cords. If necessary, extension cord use should be limited to temporary (same-day) use and must be of the proper length and gauge for the intended current. They should not be stretched across floors or located in areas where they can be damaged or pose a tripping hazard. Do not plug extension cords into power stripes.

All faculty and staff working in the lab should be instructed how to de-energize electrical service to equipment in case of an accident or fire.

Lab personnel are not to reset tripped circuit breakers. This must be done by a building engineer or electrician. Breakers should identify the circuit they control. Electrical panel(s) or electric box(s) should remain clear of obstructions at all time.

Electrical equipment used in proximity to flammable liquids and gases must be properly electrically classified. Where possible, use non-sparking induction motors or air motors to operate vacuum pumps, mechanical shakers, stirring motors, and rotary evaporators.

Appliances should be plugged directly into a receptacle and not into power stripes.

Do not use multi-plug adapters. Only power strips with surge protector are permitted. Do not plug power stripes into other power strips (daisy chain).

### **References**

UTA Electrical Safety <http://www.uta.edu/policy/forms/ehs/5electsa.pdf>

UTA Laboratory Safety Manual  
[http://www.uta.edu/policy/forms/ehs/uta\\_lab\\_safety\\_manual.pdf](http://www.uta.edu/policy/forms/ehs/uta_lab_safety_manual.pdf)

**Revised 4/2011**