

<b>University of Pittsburgh Safety Manual</b>	<b>EH&amp;S Guideline Number: 03-016</b>	
<b>Subject: LABORATORY ELECTRICAL EQUIPMENT</b>	Effective Date 3/1/08	Page 1 of 2

## LABORATORY ELECTRICAL EQUIPMENT

Electrically powered laboratory equipment may be used for heating, cooling, mixing, lighting, pumping or analytical instrument operations in the lab. 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 in the lab. Installation of hardwired equipment must be performed by an electrician.

1. 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.
2. As a minimum, the electrical inspection must insure that:
  - 1) Equipment is sufficiently enclosed to prevent accidental contact with energized parts.
  - 2) Exposed metal parts are bonded and grounded.
  - 3) Over-current protection is appropriate for intended use.
  - 4) Connections are tight and insulation intact.
3. Regular Inspections of electrical equipment should be made by a competent person within the laboratory. These visual and physical inspections are to include:
  - a) Obvious damage or defects in the accessories, connectors, plugs or sockets.
  - b) Flexible cords are effectively anchored to equipment, plugs and sockets.
  - c) 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.
  - d) Warning indicators for maximum load on power strips are intact and legible.
  - e) Controls are in good working order, i.e. they are secure, aligned and appropriately identified.
  - f) Covers and guards are present and secured.
  - g) Ventilation inlets and exhausts are unobstructed.
4. 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 your Facilities Management representative for repair information.
5. All electrical outlets, within 6' of water, must be protected by ground fault circuit interrupters (GFCI). Contact Facilities Management to have this protective circuitry installed.
6. Avoid the use of extension cords. If necessary, they should not be stretched across floors or located in areas where they can be damaged or pose a tripping hazard. Extension cord use should be limited to temporary installations and must be of the proper length and gauge for the intended current (Amps).

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7. 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.

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

Additional electrical safety information is available in the General Safety Section of the University Safety Manual.