



ANDERSON COUNTY  
ELECTRICAL SAFETY  
WHITE PAPER

Working with electricity can be dangerous. Engineers, electricians, and other professionals work with electricity directly, including working on overhead lines, cable harnesses, and circuit assemblies. Others, such as office workers and sales people, work with electricity indirectly and may also be exposed to electrical hazards.

Electricity has long been recognized as a serious workplace hazard. OSHA's electrical standards are designed to protect employees exposed to dangers such as electric shock, electrocution, fires, and explosions.

The following hazards are the most frequent causes of electrical injuries:

Lack of Ground-Fault Protection:

Due to the dynamic, rugged nature of construction work, normal use of electrical equipment at your site causes wear and tear that results in insulation breaks, short-circuits, and exposed wires. [Flexible Cords and Power Tools] If there is no ground-fault protection, these can cause a ground-fault that sends current through the worker's body, resulting in electrical burns, explosions, fire, or death.

*How Do I Avoid Hazards?*

- Use ground-fault circuit interrupters (GFCI)s on all 120-volt, single-phase, 15- and 20-ampere receptacles, *or* have an assured equipment grounding conductor program (AEGCP).
- Follow manufacturers' recommended testing procedure to insure GFCI is working correctly.
- Use double-insulated tools and equipment, distinctively marked.
- Use tools and equipment according to the instructions included in their listing, labeling or certification.
- Visually inspect all electrical equipment before use. Remove from service any equipment with frayed cords, missing ground prongs, cracked tool casings, etc. Apply a warning tag to any defective tool and do not use it until the problem has been corrected.

Path to Ground Missing or Discontinuous:

If the power supply to the electrical equipment at your site is not grounded or the path has been broken, fault current may travel through a worker's body, causing electrical burns or death. [Flexible Cords and Power Tools]. Even when the power system is properly grounded, electrical

equipment can instantly change from safe to hazardous because of extreme conditions and rough treatment.

#### *How Do I Avoid Hazards?*

- Ground all power supply systems, electrical circuits, and electrical equipment.
- Frequently inspect electrical systems to insure that the path to ground is continuous.
- Visually inspect all electrical equipment before use. Take any defective equipment out of service.
- Do not remove ground prongs from cord- and plug-connected equipment or extension cords.
- Use double-insulated tools and equipment, distinctively marked.
- Ground all exposed metal parts of equipment.
- Ground metal parts of the following non-electrical equipment, as specified by the OSHA standard [29 CFR 1926.404(f)(7)(v)]:
  - Frames and tracks of electrically operated cranes.
  - Frames of non-electrically driven elevator cars to which electric conductors are attached.
  - Hand-operated metal shifting ropes or cables of electric elevators.
  - Metal partitions, grill work, and similar metal enclosures around equipment of over 1kV between conductors.

#### Equipment Not Used in Manner Prescribed:

If electrical equipment is used in ways for which it is not designed, you can no longer depend on safety features built in by the manufacturer. This may damage your equipment and cause employee injuries.

#### Common Examples of Misused Equipment:

- Using multi-receptacle boxes designed to be mounted by fitting them with a power cord and placing them on the floor.
- Fabricating extension cords with ROMEX® wire.
- Using equipment outdoors that is labeled for use only in dry, indoor locations.
- Attaching ungrounded, two-prong adapter plugs to three-prong cords and tools.
- Using circuit breakers or fuses with the wrong rating for over-current protection, e.g. using a 30-amp breaker in a system with 15- or 20-amp receptacles. Protection is lost because it will not trip when the system's load has been exceeded.
- Using modified cords or tools, e.g., removing ground prongs, face plates, insulation, etc.
- Using cords or tools with worn insulation or exposed wires.\

### Improper Use of Extension and Flexible Cords:

The normal wear and tear on extension and flexible cords at your site can loosen or expose wires, creating hazardous conditions. [Flexible Cords] Cords that are not 3-wire type, not designed for hard-usage, or that have been modified, increase your risk of contacting electrical current.

#### *How Do I Avoid Hazards?*

- Use factory-assembled cord sets.
- Use only extension cords that are 3-wire type.
- Use only extension cords that are marked with a designation code for hard or extra-hard usage.
- Use only cords, connection devices, and fittings that are equipped with strain relief.
- Remove cords from receptacles by pulling on the plugs, not the cords.
- Continually audit cords on-site. Any cords found not to be marked for hard or extra-hard use, or which have been modified, must be taken out of service immediately.

<https://www.osha.gov/electrical>