



## Electrical Basics

It's the flow of electric current (amperage), not the voltage, that causes shock injury. When there's a current leak from a tool or piece of equipment, current flows through any available conductor until it reaches the ground. If you are in contact with the tool, the available conductor is you - unless the tool is grounded.

What happens when electrical current uses your body to ground itself? You may experience anything from a slight tingle to sudden death. Electricity causes muscles to contract. If you're holding a tool, these muscle contractions often make it impossible for you to release the tool. Severe electrical shock may cause heart muscles to contract and stop beating. You may also get blisters and burns if you make contact with a circuit.

### Avoid Contact with Electric Current

To reduce ground-fault hazards, use a three-pronged grounded plug for all nondouble-insulated electric tools. Grounding provides a safe path for electricity in the event of an electrical leak in circuitry or equipment. Grounding should be provided for:

#### The entire electrical system

- Each piece of electrical equipment and machinery
- Metal frames and shields holding or covering electrical equipment
- All nondouble-insulated portable tools, extension cords, etc., with three-prong wiring

If grounding is not available, always use double-insulated tools, as they are covered with a non-conducting surface that protects you from contact with the circuit.

### Safety Devices

- GFIs (ground fault interrupters) protect individuals from faulty machine or portable electric tools that "leak" electricity.
- Fuses, circuit breakers, and surge protectors are designed to protect circuits and equipment from damage. They do not protect people.

## Prevent Electrical Fires

Overheated circuits cause insulation around wires to burn, resulting in short circuits. To avoid electrical fires:

- Install equipment properly and only if you're qualified.
- Don't overload circuits and wiring.
- Maintain your equipment and make necessary repairs.
- Keep machines and motors clean by wiping off dust, dirt, oil and moisture on a regular basis.
- Follow your employer's lockout/tag-out procedures.

## Check for Electrical Hazards

- Regular safety inspections should be part of your job. Always check:
- Wiring for breaks; connections should be clean and tight
- Insulation for worn spots or breaks as they could cause short circuits
- Casings on machines and portable power tools for current leaks
- Belts and gears for too much tension or binding
- Safety equipment such as rubber boots and gloves for tears or holes prior to each use
- Cords of portable electric tools, as well as extension cords, for wear or damage
- Ground wires and connections to make sure they're not worn or damaged
- Machinery for overloading, misalignment, excessive vibration or for motor obstructions

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Safety tips developed based on generally accepted safety standards believed to be reliable at the date of publication. Information is for general guidance only and should not be relied upon for legal compliance purposes.

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