

Working with electricity or electrical equipment poses hazards every day in the workplace. According to the Bureau of Labor Statistics, electricity accounted for nearly 4,000 job-related injuries in the U.S. in 2019¹ and an additional 166 deaths.²

Many workers are unaware of the potential electrical hazards in their work environment, which only increases their risks. Engineers, electricians, construction workers, and other professionals work directly with or near electricity, such as overhead power lines, cable harnesses, and circuit assemblies. Others, such as factory, office, and retail workers, are often exposed indirectly to electrical hazards through faulty equipment or over-burdened extension cords. Accidental contact with electrical currents can cause electric shock, electrocution, fires, and explosions. These guidelines can help keep employees and property safe.

Report Faulty Equipment

Contact with electrical equipment that has faulty parts can cause shock, burns, and fires. In a flammable or explosive atmosphere, such as in a spray paint booth, faulty electrical equipment can become a source of ignition,



possibly causing an explosion. It is important to immediately tell a supervisor about any faulty equipment so it can get repaired or replaced. Always ensure that a lockout/tagout procedure is completed before maintenance or servicing to protect employees from machines and equipment that may unexpectedly release energy or start-up.

Lockout/Tagout Procedures:

- Prepare**
 An authorized employee must investigate and identify all [forms of hazardous energy](#) that might need to be controlled. Types of hazardous energy may include energy sources such as electrical, hydraulic, pneumatic, kinetic, potential, thermal, chemical, and radiation.

¹ U.S. Bureau of Labor Statistics, Occupational Injuries/Illnesses and Fatal Injuries Profiles, Case and Demographic Numbers, 2019, Source of injury/illness, Electrical Part plus Electrical Systems, All Ownerships, Webpage. <https://data.bls.gov/gqt/ProfileCharacteristics>. Accessed April 22, 2021.

² U.S. Bureau of Labor Statistics, Occupational Injuries/Illnesses and Fatal Injuries Profiles, Fatal Injuries Numbers, 2019, Event or exposure, Exposure to electricity, All Ownerships, Webpage. <https://data.bls.gov/gqt/ProfileCharacteristics>. Accessed April 22, 2021.

- **Shut Down**

Turn off the equipment and inform any employee affected by the shutdown, even if they are not involved in the service or maintenance.

- **Isolation**

Isolate the equipment from any source of energy. Isolation may mean any number of things, such as turning off the power at a breaker or shutting a valve. For more information, see OSHA's [Control of Hazardous Energy Lockout/Tagout](#) publication.

- **Lock and Tag**

An authorized employee must apply a lockout device, such as a padlock, blank flanges, or bolted slip blinds, to keep the equipment in a safe (energy-isolating) position. Then, a tag must be applied to the device, indicating the name of the person who performed the lockout and additional information specific to the procedure.

- **Check for Stored Energy**

Even after the energy source has been disconnected and the machine has been locked out, there may still be hazardous energy stored in the machine. At this time, it is critical to look for stored or residual hazardous energy. It must be relieved, disconnected, restrained, or made non-hazardous in some way before maintenance or serving may begin. [Ways to release stored energy](#) may include grounding, repositioning, bleeding, venting, or blocking.

- **Verify Isolation**

An authorized employee must double-check that the equipment has been properly isolated and de-energized before repair or maintenance may begin.



Wear Protective Clothing

When working around electricity, especially in a wet environment, select the right electrical-insulating gloves and Dielectric (DI) and Electrical Hazard (EH) rated rubber-soled shoes or boots. Look for liquids, such as grease, oil, and solvents, because “wet environments” applies to more than just water. Also, any moisture, such as sweaty hands while operating machinery, can result in electric shock.

Inspect Electric Tools

Always inspect and test equipment before starting work, including tools such as table saws, drill presses, and bench grinders. If any piece of machinery gives a slight shock, smokes, or sparks when the power is turned on, do not use it and notify a supervisor immediately.

Examine the Power Cord

Look for any wear in insulation, exposed wires, or frayed ends on the equipment's power cord. Always replace power cords in poor condition instead of splicing or taping them. Check the plug at the end of the cord to make sure the prongs are secure and undamaged. If one of the prongs is missing, do not use the tool and report to a supervisor.

Many power cords are equipped with one prong slightly larger than the other. Never attempt to trim the prong down to match the smaller one. These prongs are polarized to prevent shock. When unplugging a power cord from the outlet, always pull the plug, not the cord, to prevent damage.

Ground Electrical Equipment

Proper grounding protects the user if the equipment should malfunction electrically. Electric tools with a manufacturer's label that says "double-insulated" means there is insulation on the inside of the tool to protect the user from shock. These tools have a two-prong plug. Tools without the "double-insulated" label are required to have a third prong on the plug. This third prong, or ground prong, plugs the tool into a ground wire. In the event of a malfunction, the electricity goes through this ground prong to the earth and bypasses the user's body. If the prong is broken off, the user has no protection, and the electricity goes through the body. Use a Ground Fault Circuit Interrupter when there is a chance of contacting moisture on the ground outside or other wet environments inside.



Watch for Power Lines

Look for and stay away from overhead power lines. Each year, workers are injured or killed by accidentally coming into contact with high voltage lines. While electricians and line workers are generally well-informed about the dangers, other workers -- such as [tree trimmers](#), [farmworkers](#), [construction workers](#), and [those in charge of natural disaster cleanup and recovery efforts](#) -- often lack the needed information to avoid these risks. To prevent this from happening, preplan the job. Go to the area where large equipment, irrigation piping, ladders, or other long or boom-type lifting machines may be used. Look for electric poles and overhead wires, and plan the job at least 10 feet from them. Use more than 10 feet if the voltage to ground is over 50 kilovolts (50,000 volts). The higher the voltage, the greater the distance that is needed between the lines and the workers. (See Occupational Safety and Health Administration (OSHA) Title 29 of the Code of Federal Regulations (CFR) Part [1926.1408](#).)

While a glance around the job site can help workers identify overhead lines, many power lines are buried underground. Always contact a utility locator service or the [Texas Railroad Commission](#) at **811** at least two full business days before digging if the task involves any excavating.

Use Extension Cords with Care

An important element of electrical safety is the proper use of extension cords. The most important thing to remember is that extension cords are for temporary use (up to 90 days in General Industry workplaces). Install permanent wiring in conduit when usage is no longer temporary. Additionally, no extension cord can be kinked, tied in a knot, crushed, cut, or bent, and still insulate the electrical current safely. An extension cord misused in this manner may cause a short circuit, fire, or electrical shock.

Avoid using extension cords in areas that receive a lot of traffic. It can cause people to trip, and the constant traffic can wear out the insulating rubber cover. If there is no choice but to use extension cords in high traffic areas, make sure the cords are taped securely to the flooring or are hanging high overhead. For more information on extension cord safety, download the Texas Department of Insurance, Division of Workers' Compensation (DWC)-Workplace Safety's [Extension Cord Safety Fact Sheet](#).

Never Throw Water on an Electrical Fire

Water and electricity do not mix! In fact, water is an excellent conductor of electricity and can spread fire if thrown on an electrical fire. Electrical fires are best put out by using a dry chemical fire extinguisher. Companies are encouraged to provide regular training on the location and use of all fire extinguishers. Ensure employees are familiar with the **PASS** System: **P**ull the pin on the fire extinguisher; **A**im the extinguisher nozzle at the base of the fire; **S**queeze the trigger; and **S**weep side to side.

Practice Good Housekeeping

Electrical safety involves more than ensuring that electrical equipment is in good working order. It also involves ensuring that employees can get to the main power source as quickly as possible without climbing over obstructions. Keep aisles and walkways clean and clear of garbage. Ensure flammable liquids, such as chemicals and cleaning supplies, are stored away from the area where electric tools are operated. Many electric tools produce sparks that may ignite flammable liquid fumes, causing extensive damage.

Additional Resources

For more information on electrical safety, download any of the following material:

- **OSHA**

[Electric Power Generation, Transmission, and Distribution Standard](#);

[Electrical Safety for Construction](#);

[Electrical Hazard Recognition](#);

[Lockout-Tagout Interactive Training Program](#); and

[Working Safely Near Overhead Power Lines](#).

- **DWC**

[Electric Shock Take 5 for Safety](#);

[Electrical Safety Training Program](#);

[Extension Cord Safety Fact Sheet](#); and

[Power Line Safety Fact Sheet](#).



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