

Electrical Safety Procedure

Many electrocutions, injuries, and fires can be prevented simply by understanding basic electrical safety principles and adhering to safe practices. TAMUT EHS has developed resources to help educate faculty, staff, and students.

Whether you are a researcher or zone shop employee, electrical safety should be a top priority in your workplace. Awareness of electrical hazards is the key to reducing the staggering number of electrically-related fires, injuries and deaths that occur every year.

The following resources and programs from EHS will help you gain a better understanding of how to use electricity and electrical products safely:

Extension Cords

Extension cords often are necessary for many outdoor activities and events. Because they are exposed, flexible, and unsecured, they are more susceptible to damage than fixed wiring. Hazards are created when cords, cord connectors, receptacles, and cord-and plug-connected equipment are improperly used and maintained. The following are the basic requirements when using extension cords for temporary use:

- Do not plug extension cords together. Only use an extension cord that is the correct length for each application. Extending the length of an extension cord by “daisy-chaining” more than one cord together can lead to overheating the cord by overloading it, creating a serious fire hazard.
- Do not create a trip hazard with an extension cord. Secure extension cord to the ground to prevent a trip hazard for pedestrians, however do not use metal staples or nails to secure the cord.
- Do not exceed the rating of the extension cord. The following fact sheet provides guidance for various cord lengths, amperage ratings, typical appliance uses, and minimum wire gauges. The fact sheet also provides extension cord inspection criteria to be performed prior to each use.

Factsheet: Extension Cords

Extension cords often are necessary for many outdoor activities and events. Because they are exposed, flexible, and unsecured, they are more susceptible to damage than fixed wiring. Hazards are created when cords, cord connectors, receptacles, and cord-and plug-connected equipment are improperly used and maintained. **Secure extension cords to the ground to prevent tripping hazard.**

Strain Relief

To reduce hazards, extension cords must be able to handle the amperage rating for the equipment that is being used with (see table for reference). Do not use an indoor extension cord for outside use. They do not have the same insulation and have a lower amperage rating.

Cord Damage

An extension cord may be damaged by door or window edges, by staples and fastenings, by abrasion from adjacent materials, or simply by aging. If the electrical conductors become exposed, there is a danger of shocks, burns, or fire. **Do not use frayed or damaged cords. Electrical tape is not a solution.**

Durability

The OSHA construction standard requires flexible cords to be rated for hard or extra-hard usage. These ratings are derived from the National Electrical Code, and are required to be marked approximately every foot along the length of the cord. Examples of these codes are: S, ST, SO, and STO for hard service, and SJ, SJO, SJT, and SJTO for junior hard service.

Grounding

Extension cords must be 3-wire type so they may be grounded, and to permit grounding of any tools or equipment connected to them.

Wet Conditions

When a cord connector is wet, electric current can leak to the equipment grounding conductor, and to humans who pick up that connector if they provide a path to ground. Such leakage can occur not just on the face of the connector, but at any wetted portion. Limit exposure of connectors and tools to excessive moisture by using watertight or sealable connectors.



Note: This page is adapted from OSHA eTool: Construction, Electrical Hazards, and Flexible Cords.

Cord Length	Device Amperage Rating	Good for Use with	Minimum Wire Gauge
25 Feet	1 – 13 Amps	Christmas or work lights Portable fans Hedge trimmers	16 Gauge (Light Duty)
25 Feet	14 – 15 Amps	Lawn mowers Power drills Table saws	14 Gauge (Medium Duty)
25 Feet	16 – 20 Amps	Chain & Circular saws Shop vacs Air Compressors	12 Gauge (Heavy Duty) or 10 Gauge (Extra Heavy Duty)
50 Feet	1 – 13 Amps	Christmas or work lights Portable fans Hedge trimmers	16 Gauge (Light Duty)
50 Feet	14 – 15 Amps	Lawn mowers Power drills Table saws	14 Gauge (Medium Duty)
50 Feet	16 – 20 Amps	Chain or Circular saws Shop vacs	12 Gauge (Heavy Duty) or 10 Gauge (Extra Heavy Duty)
100 Feet	1 – 10 Amps	Christmas or work lights Portable fans Hedge trimmers	16 Gauge (Light Duty)
100 Feet	11 – 13 Amps	Lawn mowers Power drills Table saws	14 Gauge (Medium Duty)
100 Feet	14 – 15 Amps	Chain or Circular saws Shop vacs	12 Gauge (Heavy Duty)
100 Feet	16 – 20 Amps	Air compressors	10 Gauge (Extra Heavy Duty)
150 Feet	1 – 7 Amps	Christmas lights Work lights Portable fans	14 Gauge (Medium Duty)
150 Feet	8 – 10 Amps	Lawn mowers Power drills	12 Gauge (Heavy Duty)
150 Feet	11 – 15 Amps	Table, Chain, and Circular saws Shop vacs	10 Gauge (Extra Heavy Duty) ¹

Designation Letter	Meaning
S	Indicates a flexible cord designed for general use.
W	Indicates the cord is rated for outdoor use.
J	Indicates the cord with standard 300 voltage insulation. If there is no J in the designation, the cord has thicker, 600-volt insulation, designed for heavier use.
P	Indicates parallel wire construction, used in air conditioner & household extension cords.
T	Indicates the cord jacket is made from vinyl thermoplastic.
E	Indicates the cord jacket is made from thermoplastic elastomer rubber (TPE).
O	Indicates the cord is oil-resistant.