NATURE OF ELECTRICAL ACCIDENTS

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Electrical incidents are caused by many different events; however we can identify three common root causes for just about any electrical incident:

- Working on unsafe equipment and installations;
- Unsafe Environment (i.e. wet environment / presence of flammable vapors); and
- Unsafe work performance

EXTENSION CORDS

The U.S. Consumer Product Safety Commission (CPSC) estimates that each year, about 4000 injuries associated with electric extension cords are treated in hospital emergency rooms. About half of the injuries involve fractures, lacerations, contusions or sprains from people tripping over extension cords. CPSC also estimates that about 3000 residential fires originate in extension cords each year, killing 50 people and injuring about 270 others. The most frequent causes of such fires are short circuits, overloading, damage and/or misuse of extension cords.

When in need of an extension cord, it's imperative to know that just because a particular cord is long enough, it's not necessarily the right one for the job. Many erroneously believe length is the only characteristic that sets one extension cord apart from another, but there's far more that should be considered.

Power extension cords are not created equal, but rather are manufactured for use in specific applications and environments, and to carry varying amounts of electrical current. By basing the extension cord choice on each task's specific requirements, you can greatly reduce the risks of fire, electrical shock and injury that come with improper use.

CLASSIFICATIONS

Extension cords are classified for either indoor or outdoor use. The insulation or jacket of an outdoor-rated extension cord is made of a tougher material, which designed to withstand temperature changes, moisture, UV rays, and sometimes chemicals. While it's fine to use an outdoor power cords indoors, never use an indoor-rated extension cord for an outside job. Doing so could cause electric shock or create a fire hazard.

Wattage Rating

The number of watts an extension cord can safely transmit (given its length and gauge) is known as a wattage rating. Before plugging an appliance or power tool into an extension cord, it's extremely important to be sure that the power demand (or pull) of that device doesn't exceed the cord's wattage rating.

Gauge and Distance

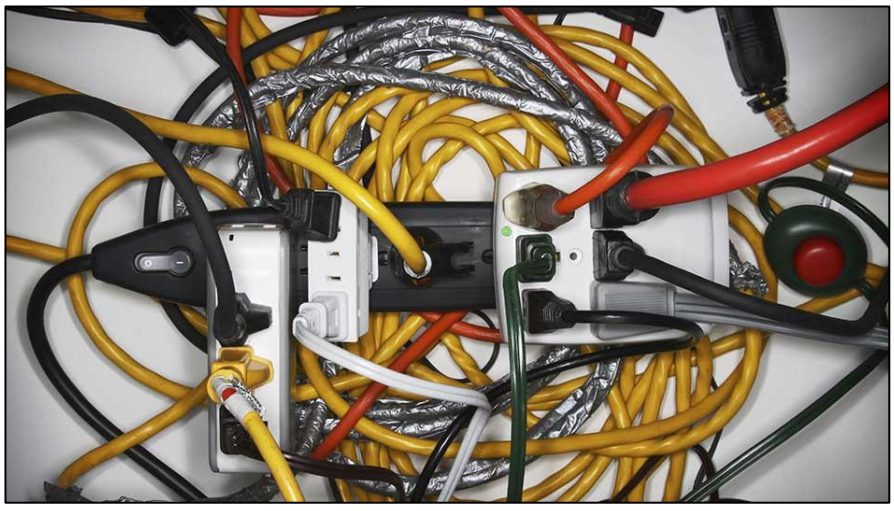
Any electrical cord, extension or otherwise, contains an inner metal conducting wire, which carries electrical current form one end to the other. The thickness of this conductor is referred to as its gauge. Gauge is indicated by a number; the lower the number, the thicker the wire is. A wire's thickness directly affects the amount of current it can carry over a certain distance.

Power Requirements

It's important to know how much electricity is required to run a given device before you plug in. For the most part, you won't need to do more than consult the manufacturer's instructions. Another good place to look for wattage specs is on the tag often attached to a device's power cord and if all else fails, a quick call to the product's manufacturer.

Powering Multiple Devices

If you plan to plug more than one device into a given extension cord, calculate their combined energy requirements and make sure that the total isn't higher than the wattage rating for that cord. Never use an extension cord to supply more wattage than it's rated for, since overheating and fire may occur.



Amps/Volts vs Watts

In some cases, you may find power requirements listed in amps and volts instead of watts. For these situations, there's a simple formula that can help you calculate elctricity requirements. Just multiply the number of amps by the number of volts – the resulting number equals that appliance's wattage. Here's an example:
If a device uses 5 amps at 110 volts, that translates into 550 watts (5 x 110 = 550).

SIRIM Approval

When shopping for extension cords, only purchase those that bear the SIRIM symbol. The presence of the SIRIM mark tells you that samples of that particular type of cord have been tested by SIRIM and received consumer safety approval.

Alterations

Do not cut, file or otherwise alter an extension cord's grounding pin or plug blades to make it easier to plug into an outlet. If the extension cord plug doesn't fit into an older outlet, have an electrician to replace the receptacle.

Unplugging

Regardless of wether or not it's being used, as long as a power extension cord is plugged into an outlet, it's conducting electricity. To avoid potential safety hazards, always remember to unplug extension cords when they're not in use.

Childproofing

If your electrical extension cord can accommodate multiple plugs but not all receptacles are being used, block unused openings with outlet cover to prevent injury.

CURRENT	REACTION
Below 1 mA	Generally not perceptible
1 mA	Faint tingle
5 mA	Slight shock felt, not painful but disturbing, average individual can let go, strong involuntary reactions can lead to other injuries.
6 mA to 25 mA	Painful shock, lost muscular control
9mA to 30 mA	The freezing current or let go range, individual cannot let go but can be thrown away from the circuit if extensor muscles are stimulated
50 mA to 150 mA	Extreme paint, respiratory arrest, severe muscular contraction and *death possible*
1,000 mA to 4,300 mA	Rhythmic pumping action of the heart ceases, muscular contraction and nerve damage occur and *death likely*
10,000 mA	Cardiac arrest, severe burns and *death probable*

Effect of Electrical Current in Human Body

Storage

Extended exposure to outdoor conditions can cause cords to deteriorate. So whether they're rated for indoors or outdoors, store all extension cords inside when they're not in use.

WAYS TO PROTECT THE WORKERS

There exists a number of ways to protect workers from the threat of electrical hazards. Some of the methods are for the protection of qualified employees doing work on electrical circuit and other methods are geared towards nonqualified employees who work nearby energized equipment. Here are a few of the protective methods:

- De-energize the circuit
- Work Practices
- Insulation
- Guarding
- Barricades
- Ground Fault Circuit Interrupters (GFCI)
- Grounding (secondary protection)

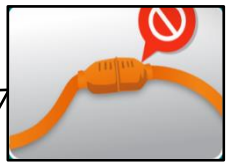
Additionally, the use of ***alerting techniques*** are effective ways to warn employees (especially non-qualified) of the dangers present. Alerting techniques might include safety signs, safety symbols, or accident prevention tags. Often times, the use of such signs alone is not adequate as an employee (especially a non-qualified employee) may accidentally come in direct contact with an energized circuit. In these instances a barricade shall be used in conjunction with safety signs.

A ***barricade*** is an effective way to prevent or limit employee access to work areas exposing employees to un-insulated energized conductors or circuit parts. Conductive barricades may not be used where they might cause an electrical contact hazard. If signs and barricades do not provide sufficient warning and protection from electrical hazards, an attendant shall be stationed to warn and protect employees.

A common Electrical Hazard Signage

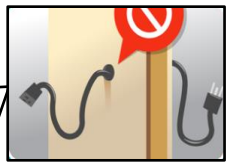
Extension Cord Safety Tips Do's and Don't's

Don't attempt to plug extension cord into one another.



Don't overload extension cords.

Don't run through walls, doorways, ceilings or floors. If cord is covered, heat cannot escape may result in fire.



Don't nail or staple electrical cords to walls or baseboard.

Don't substitute extension cords for permanent wiring.

Don't leave outdoor extension cords on standing water.

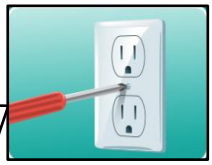
Don't use three prongs plugs with outlets that only have two slots. Don't cut off the ground pin to force a fit, which could lead to electric shock.

Buy cords that have been approved by independent testing laboratory.

Inspect cords for damage before use. Check for cracked or frayed sockets, loose or bare wires and loose connection.

Make sure extension cords are properly rated for the intended use, indoor or outdoor, meet or exceed the power needs of the appliances being used.

A heavy reliance on extension cords indicates insufficiency. Have additional outlets installed where you need them.



Electric shock emergency action

If possible, switch off and isolate source of power.
Immediately commit medical help or assistance.

If power source cannot be isolated, push or pull the casualty free of power source by using non- conductive material ensuring that you:

- Do not come into a contact with the power source that has disabled the casualty.
- Do not electrocute yourself.

After removing the casualty from the power source then:

- Check for unconsciousness.
- Remove any obstruction in casualty's mouth.
- Immediate proceed with the first aid measures as listed below.

First aid measures

Airway

- Check airway is clear and free of obstacle.
- Check the casualty's tongue is not obstructing airway.
- Open the airway by tilling head back and lifting the chin upwards.

Breathing

- Check for breathing – look listen and feel, if casualty is breathing.
- Place into the recovery position, ensure the airway remains open and monitor the casualty until the medical arrives.
- If casualty is not breathing – Start mouth to mouth resuscitation by keeping airway free and breathe into the casualty's mouth ensuring a seal is formed at the rate of 10 breaths per minute.
- Allowing the casualty's chest rise and fall between breaths.
- Then check the circulation – if sign of circulation is present continue breathing for casualty until capable of breathing without assistance.
- Monitor casualty's until medical help arrives.

Circulation

- Feel for the pulse either on the casualty's neck or wrist, if a pulse is present place the casualty into the recovery position and monitor until medical help arrives.
- If no pulse is present, start breaths/compression sequence.
- Repeat the breaths/compression sequence until the casualty shows sign of recovery.
- Monitor casualty's until medical help arrives.

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