



#### **Introduction**

The more we work with power tools, the more likely we are to take their power for granted. By their very nature, power tools are an electrical hazard as well as a laceration and amputation hazard. An injury-free safety culture demands that we respect the power and keep the danger of these tools on our minds all the time. Look out for yourself and your colleagues by reviewing best practices with power tools this week: electrical safety, power extension cords, battery powered tools, and air powered tools.

#### **Monday      **Electrical Safety****

AC electricity is a movement of electrons through a conductor from its source to ground. One thing to remember is electricity will always want to seek ground and will always take the path of less resistance to get there. We are so sure of this we base all of electrical theory and code on that one basic fact.

You are a conductor of electricity, just not a very good one. That being said electricity will travel through you if it has to seek ground. Because you are not a good conductor it will require more “AMPS” or power to go to ground, and this is why electrocution becomes dangerous to you.

Electricity insulators are non-conductive materials such as: glass, dry wood, rubber, ceramic, plastic and paper to name a few common ones. Power tools are double insulated. The wiring is insulated with plastic, but also the handle and other tool components are made of a hard plastic. Power tools with the third pole on the plug for a ground wire are preferred.

Take a look at your corded power tools and make sure they have the third ground wire pole and that they are properly plugged into a power source or extension cord.

#### **Tuesday      **Power Extension Cords****

Extension cords have 2 changing factors: Wire Gauge and Cord Length:

**Wire Gauge** is the size of the conductor inside the cord. It may seem a little backwards to you, but the *lower* the gauge number the *more* AMPS the cord can handle.

**Length** determines how much power the cord can deliver to the tool. The longer the extension cord means the electricity will need more power or AMPS to get to the tool. You will most likely need a heavy gauge wire with a low gauge number to achieve this.

Power Cord “no-no’s”:

**Trip Hazard** – cords across walking areas that are not properly covered with plastic strips or duct tape

**Overloads** – power strips with multiple outlets that have too many cords plugged in, and those cords are pulling too many amps which is a fire hazard

**Missing Insulation** – a cut or frayed cord that exposes the wires (don’t depend on electrical tape)



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**Pulled Cord from Plug** – the cord’s insulation cover has pulled away from the plug, exposing the wires

**Missing Third Post on Plug** – removed, broken or missing third post cancels out the grounding wire which is a fire hazard (don’t remove a third post to make a plug fit an outlet it is not designed for, it will pull too many amps on the circuit and cause a fire)

#### Wednesday      **Battery Powered Tools**

For most corded power tools there is a battery operated counterpart. Battery operated power tools are quickly replacing the corded power tools used in the past, as newer batteries can store and provide more power than ever before. The only down side is battery disposal and cost. When compared to the cost of energy consumed, in most cases you will be ahead of the game. These battery powered tools are also more ergonomic because their light weight and clutch activity prevents wrist injury. Do be aware that battery powered tools still use electricity and should not be used near water.

Battery operated power tools are a great alternative and have a lot of benefits over the corded tools:

- Have no electrocution potential
- In most cases are lighter in weight
- Have no tripping hazard from cords
- Require less energy consumption (charging battery is all there is)
- Can be operated out in the field where electricity is not available
- If you discard the battery as noted by manufacturer, the environmental impact is very low

#### Thursday      **Air Powered Tools**

Air Power tools are used when you need extreme torque to accomplish the task. Also called Pneumatic tools, air powered tools are driven by an air compressor. These tools must be connected by an air hose (which has its own risks similar to a power extension cord). In general, air powered tools are:

- Used in industry (factories, construction, auto garages, and NASCAR)
- Usually very heavy (think jackhammers)
- Have a lot of torque (wrist breaking power)
- Require a lot of energy to operate
- Are the most expensive tool to use (compressed air generators are very expensive)

Air Power tools are fast and very powerful. Compressed air is a stored energy device. Things happen quicker than you can react, stronger than any person, and often when you do not expect. Because of this they pose the greatest risk to personal safety. Be smart about compressed air:

- Do not use compressed air for any other purpose than that for which it is provided – it is not a leaf blower.
- Never direct a stream of compressed air towards your body or the body of another person – it can cut or sever.
- Do not use compressed air to cool yourself or blow dust from the clothes or hair.
- Never indulge in so-called “practical jokes” with compressed air.

Air compressor tanks are becoming more popular for home improvement uses, usually portable at 1.5 – 6 gallons of air tanks. Small compressors with less than 6 horsepower motors can be plugged into 120-volt household outlets. Home improvement tools are lighter because they do not have an electric motor, such as: painting, wrenches, drills, reciprocating



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saws, sanders, ratchets, nailers and staplers. Some home use and machine shop canisters are on rollers and handle up to 30 gallons of air. Large compressors with greater than 6 horsepower require at least 240-volt outlets. A home garage or workshop would have to be re-wired by a licensed electrician to be able to handle that electrical load safely.

Industrial use canisters are handling 60 gallons or more and are very heavy. These are not portable and should be fastened to the floor and/or walls. Do not connect two air compressors together to get more power – the tools are not designed for that, and the canisters could explode from the increased psi pressure.

#### **Friday      Good Safe Practices for Power Tools**

- When not in use for extended time (breaks, shift change, staff changes, etc.) it is a good idea to remove the power source. This prevents accidental starting of the tool and avoids near misses.
- When done with a power tool place it in the case if supplied. This protects the tool from damage.
- Only use the tool for its designed use. Power tools are not hammers or pry bars.
- Use flash curtained and have hot work permits for grinding applications.
- Make sure work signs are posted in the area so people are aware of the power tool activities.
- Depending on the power tool you are using, PPE devices will be required. It is important to familiarize yourself with the manufacturer's safety precautions prior to use. You may need boots, eye protection, gloves, face shields, hearing protection or hard hats.
- Make sure guards are in place and never remove them while tool is in use.
- Keep close track of tools when working at heights. A falling tool can kill a co-worker.
- Make sure your grip and footing are secure when using large tools.

Today take a few minutes to inspect all power tools prior to use and look for:

- Cracked housing
- Frayed power cords or signs of excessive heat “melting insulation”
- Support handles are intact
- Grinding wheel conditions - cracked or damaged wheels
- Power actuator “trigger” is in good operating condition
- Air tools have the correct oil in the gear casing
- Batteries do not have excessive heat when being used (most cases they will not charge due to the charger checks the battery every time it is charged)