



Safety 24/7 Education

Hand and Power Tool Safety



The use of hand and power tools for DIY home improvement projects is very common. Handling these devices is second nature to many people. Unfortunately, that's precisely why so many individuals tend to overlook the hazards they can pose. Each year, thousands of people end up in emergency rooms due to accidents involving hand and power tools. In most cases, mishaps take place due to a tool misuse or missing safety gear. These types of errors can be avoided easily by recognizing potential hazards and taking precautions. The following tips should help any beginner or, perhaps, a seasoned pro who's become a bit too comfortable — stay safe.

According to a study conducted by the Consumer Product Safety Commission, hand and power tool injuries send an average of 400,000 people to the emergency room each year. These tools can cause lacerations, puncture wounds, dismemberment, burns, electrical shock, and death. Fortunately, there are many preventative measures that can be taken to prevent tool injuries from occurring.

Personal Protection

The type of personal protective equipment (PPE) you need when using hand tools depends on the tool being used and the hazard(s) created by use of the tool. At a minimum, eye protection in the form of safety glasses or goggles must be worn at all times. The simple act of snipping copper wire with side-cutting pliers, striking a nail with a hammer, or sawing wood can propel small pieces of debris into the air. A full face shield could also be used over the safety glasses or goggles to provide protection to the face if the potential hazard dictates the need.

It is also important to protect your hands from cuts, abrasion, and repeated impact. Cut-resistant gloves are not designed for, or capable of providing protection against a moving blade or bit. The best way to prevent injury from moving parts is to keep your hands on the tools' handles and keep all guards in place. Wearing standard cotton or leather gloves can help prevent wood splinters or skin abrasions from handling lumber. For projects that require long periods of hammering, impact-resistant gloves with gel or rubber palms can reduce vibration.

Safety shoes/boots can help protect your feet from injury caused by a dropped tool or misdirected electricity. Do not wear sandals, open-toed, or canvas shoes when working



with tools. In addition, safety footwear can incorporate other protection such as metatarsal guards, puncture-resistant soles, and electrical insulation. Choose footwear that offers adequate traction for your work site.

The higher sound levels generated by some power tools, especially if used over extended periods of time, may require the use of earplugs or earmuffs. Power sanding and grinding operations may require the use of a particulate respirator. Each situation must be analyzed to determine the type of PPE that is required for the safe use of each type of tool.

Along with PPE, proper attire is also important while using hand and power tools. Tie back or cover long hair and don't wear loose or torn clothing. Hair and clothing that strays too far from the body can get caught in power tools. Because of this potential, loose jewelry should be avoided as well.

Do not operate power tools when you are ill, taking strong medications, fatigued, or consuming alcoholic drinks. Do not smoke while working with tools.

Work Areas

Keeping workshop and storage spaces clean and dry can help prevent many accidents. Sparks can ignite scraps, sawdust, and solvents. Water can conduct electricity. Do not stand in water, on damp floors, or in the rain when working with electrical tools. Keep hands and tools dry.

Make sure workshops and storage areas have the proper electrical wiring and outlets needed to run power tools. Install adequate wiring to handle the electrical load required. All outlets should have three pronged plugs or be double-insulated. Any outlets that may come in contact with water should have ground fault circuit interrupters. Never use indoor tools outside. Use only approved outdoor extension cords. Use one long extension cord instead of several short ones. Do not damage or cut extension cords.

When working on ladders or scaffolding, rest power tools on a flat surface or in a bin secured to the ladder itself. A falling tool can seriously injure a bystander. Never carry heavy power tools up and down ladders.

Stop working and turn off the power tool you are working with if distracted by something or someone. Never look away from your work when operating a power tool.

Take extra care when working with hazardous materials. Handle fiberglass with care. Its particles can irritate the skin, eyes, and respiratory system. When soldering, remember that lead solder is toxic. The work area should be ventilated and flammable material properly stored.

Safety Measures

If your workshop is set up in the basement, garage, or any other room, keep a first aid kit at hand, and if possible, a telephone with a list of emergency numbers. Install an all-purpose fire extinguisher and smoke alarms in the area where tools are used.



Electric Shock

Power tools can cause electric shock when used improperly. To lower the risk of electric shock, you should never attempt to override the safety features on a three-pronged plug. They should only operate tools within their design limitations, and always wear appropriate safety gloves and footwear. Store tools in a clean, dry place when not in use, and should never use power tools in damp or wet locations unless the tools are specifically rated to do so.

Safety for Specific Tools

Pneumatic Tools: They are powered by compressed air. If used improperly, the hose that attaches the tool to an air supply can detach, flinging the tool or attachment toward the user or others. Other hazards of pneumatic tools include excessive noise, vibration, fatigue, and strains.

Hydraulic Tools: They use pressurized fluid to generate force. Jacks are the most common example of a hydraulic tool. Users should always take care to select the proper type of fluid to use in a hydraulic tool. When using a hydraulic jack, users should always take the following precautions:

- Make sure that the base rests on a firm, level surface.
- Ensure that the tool is correctly centered.
- Check that the lift force is applied evenly.

Jacks should never be used to support a lifted load. They can easily cause fatal crushing injuries if improperly used.

Liquid Fuel Tools: They are powered by fuel, typically gasoline. Users must always transport and store fuel only in approved flammable liquid containers. Before refilling a liquid fuel tool's tank, you must shut down the engine and allow it to completely cool. If a tool is refueled while the engine is still hot, the pre-existing heat could ignite fuel vapors and cause a fire or explosion.

Powder-Actuated Tools: They operate like a loaded gun. These should never be used in an explosive or flammable environment. You should never load a powder-actuated tool unless it is going to be used immediately, and should never leave a loaded tool unattended, especially where it might be available to an unauthorized user. Users should always select the powder level that can do the intended work without excessive force. If a tool misfires, the user should hold it in place for thirty seconds before attempting to fire it again. If it misfires a second time, the user should hold it in place for thirty seconds, remove the load, and immediately place the faulty cartridge in water to lessen the chance of explosion.

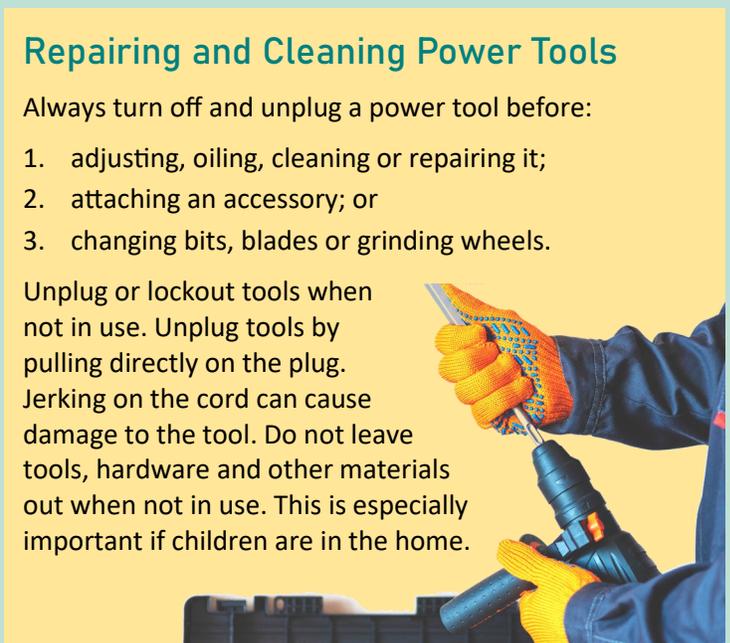
Abrasive Wheel Tools: They can send sharp fragments and debris flying, potentially injuring the operator or others. These tools must be equipped with a special guard, and wheels should be properly ring-tested before each use. Users should never clamp a hand-held grinder in a vise and must wear both eye and face protection.

Repairing and Cleaning Power Tools

Always turn off and unplug a power tool before:

1. adjusting, oiling, cleaning or repairing it;
2. attaching an accessory; or
3. changing bits, blades or grinding wheels.

Unplug or lockout tools when not in use. Unplug tools by pulling directly on the plug. Jerking on the cord can cause damage to the tool. Do not leave tools, hardware and other materials out when not in use. This is especially important if children are in the home.



To summarize, special attention toward hand and power tool safety is necessary in order to reduce or eliminate hazards. To prevent hazards associated with the use of power tools, you should observe the general precautions listed below.

Do's

Maintain a firm grip and balance.

Losing control of the tool is guaranteed to create a hazardous situation. If you feel that a tool may be too heavy for you, do not use it.

Keep all tools in good condition with regular maintenance.

Inspection of tools should be done regularly to lower the risk of injuries due to malfunctioning equipment and to prevent unexpected downtimes which negatively impact operational efficiency.

Operate tools according to the manufacturers' instructions.

Equipment manuals help guide users on how to handle and operate tools as intended. You should read and comply with manufacturers' guides to avoid mishandling of tools.

Wear proper personal protective equipment (PPE).

PPE helps in ensuring your safety by reducing the overall physical hazards caused by power tools.

Use the right tool for the job.

Hand and power tools are made differently depending on its function. Choosing the tool appropriate for the job is necessary to avoid incidents and injuries.

Don'ts

Do not use power tools if you're under the influence of alcohol or drugs, feeling unwell, in pain, distracted, or tired.

Do not leave power tools plugged if unattended.

Never yank the cord or hose to disconnect it.

Do not carry power tools by their cable or hose.

Never attempt to override or remove any guards.

Do not use power tools unless you have proper training.

Never use a power tool that is not properly grounded.

Do not use electric tools in wet or damp conditions unless they are approved for that use.