TOOL SAFETY

Everyone is familiar with common, everyday tools, but don't take them for granted.

AVOID TOOL INJURIES

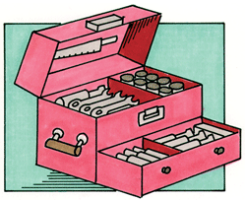
Crushed hands and arms, severed fingers, blindness - the list of possible machinery-related injuries is as long as it is horrifying. There seem to be as many hazards created by moving machine parts as there are types of machines. And, commonly used portable tools also cause serious injuries. Even hand tools cause injuries. Too frequently, tool use causes serious eye injuries, lacerations, fractures, burns, and minor scrapes, cuts, or bruises.

In addition, most machines and power tools are powered by electricity. Electrical hazards are equally harmful.

GENERAL TOOL SAFETY RULES

Injuries can be prevented by keeping tools in good condition, using the right tool for the job, using the tool properly, and wearing required personal protective equipment.

- Keep your work area well lit, clean, and dry.
- Stand where you have firm footing and good balance while you use any tools.
- Arrange the work and use portable tools so that the tool will move away from your hands and body if it slips.
- Make sure that the material you are working on is held securely - use clamps or a vise if you need to.
- Use the right tool for the job. Don't force a small tool to do heavy-duty work.

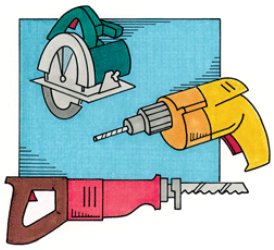


- Regularly inspect tools, cords, and accessories. Repair or replace problem equipment immediately.
- Never use a dull blade or cutting edge.
- Keep electric cables and cords clean and free from kinks. Never carry a tool by its cord.
- Use all guards and safety devices (i.e., three-prong plugs, double-insulated tools, and safety switches) that are designed to be used with the equipment.
- Dress right. Never wear clothing or jewelry that could become entangled in machinery or power tools.
- Use protective equipment when necessary. This might include safety glasses, hearing protection, and respiratory protection.
- Make adjustments and accessory changes when machinery is turned off and unplugged.

- Concentrate - don't take your eyes off your work or talk to anyone as you use tools.
- Maintain your tools. Keep them sharp, oiled, and stored in a safe, dry place.
- Install or repair equipment only if you're qualified. A faulty job may cause fires or seriously injure you or other workers.

Good tool habits soon become second nature. Follow the tool safety guidelines at your workplace and the equipment you operate will serve you efficiently and safely.

Select the tool you need



Use durable tools made from good quality materials. Metal tools should have working points that resist bending, cracking, chipping, or excessive wear from normal use. Handles should be made of durable material that does not crack or splinter easily if the tool is dropped or hit.

Pay extra attention to any hand tools that you will be using around exposed electrical parts. Make sure that the handle is electrically insulated and rated to handle the voltage. If you need to use tools to work in areas where flammable liquids are stored or used, hand tools must be made from non-sparking alloys and power tools must be approved for the hazard in order to prevent sparks that can ignite flammable vapors.

PERSONAL PROTECTIVE EQUIPMENT

Engineering controls eliminate the hazard at the source. But whenever engineering controls are not available or are not fully capable of protecting you, you must wear protective clothing or personal protective equipment (PPE).

Always wear safety glasses when using hammers, chisels, wire cutters, crowbars, bolt cutters, saws, drills, grinders, or any tool that could create chips, pieces, or sparks. If machine coolants could splash, then face shields and safety goggles might be necessary. Wear cut-resistant gloves when handling knives or other sharp-edged hand tools. Caps and hair nets can help keep your hair from being caught in machinery. Hearing protection may be needed when operating noisy machines.

It is important to note that PPE and other clothing can create hazards. Protective gloves can become caught in rotating parts. Loose-fitting shirts might possibly become entangled. Jewelry can catch on machine parts and lead to serious injury by pulling a hand into the danger area.

USE THE RIGHT HAND TOOL THE RIGHT WAY

Look at your hand tools. Their shape and design shows you how they are intended to be used.

Knives: Using knives as pries, screwdrivers, can openers, awls, or punches can easily damage the blade. A sharp blade needs less pressure to cut and has less of a chance of getting hung up and slipping. Always move the blade away from you as you cut.

Screwdrivers: Using screwdrivers as pries, can openers, punches, chisels, wedges, etc. can cause chipped, rounded, bent, dull tips; bent shafts; and split or broken handles. If the screwdriver tip doesn't fit the screw, you'll apply more force and the screwdriver can easily slip. Redress the tips of flat head screwdrivers to keep them sharp and square edged. Screwdrivers with shorter shafts give you better control. Screwdrivers with thicker handles apply more torque, with less effort on your part.

Hammers and Mallets: Nail hammers are designed to drive nails. Ball peen hammers are designed for striking cold chisels and metal punches. Mallets have a striking head of plastic, wood, or rawhide and are designed for striking wood chisels, punches, or dies. Sledgehammers are for striking concrete or stone. You can damage a hammer by trying to use it for the wrong purpose. Don't use a hammer with a mushroomed striking surface or a loose handle. You can damage other tools by trying to force them by hitting them with a hammer.

Pliers: Don't substitute a plier for a wrench. The face of the pliers is not designed to grip a fastener, and the pliers can easily slip off of the nut or bolt. Pliers are designed for gripping so you can more easily bend or pull material. They'll provide a strong grip if you protect them from getting bent out of shape and keep the gripping surface from being damaged.

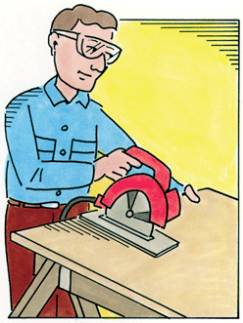
Cutters: Use cutters or snips to remove banding wire or strapping. Trying to use a pry bar to snap open banding can cause injuries. Keep the cutting edges sharp and protect them from getting nicked or gouged.

Wrenches: Use adjustable open-ended wrenches for light-duty jobs when the proper sized wrench isn't available. Position yourself so you will be pulling the wrench towards you, with the open end facing you - this lessens the chance of the wrench slipping off of the fastener when you apply force. Select an open-ended wrench to fit the fastener for medium-duty jobs. With the snug fit, these wrenches can apply more force than an adjustable open-ended wrench. Again, pull the wrench with the open end facing you to avoid slippage. Box and socket wrenches should be used when a heavy pull is required. Because they completely encircle the fastener, they apply even pressure with a minimal chance of slipping. Some box wrenches are designed for heavy-duty use, and they do have a striking surface. But, in general, don't try to increase the torque by hitting the wrench with a hammer or by adding a cheater bar to the wrench's handle - this can break or damage the wrench. If the fastener is too tight, use some penetrating oil to lubricate it.

Wood Saws: For cutting wood, use a cross-cut saw to cut across the grain, and use a ripping saw to cut with the grain. Select a saw with coarse teeth for sawing green wood, thick lumber, or for making coarse cuts. Fine-toothed saws can be used to make fine cuts in dry wood. After use, wipe the saw with a lightly oiled rag to keep the teeth clean. Protect the saw from getting bent or damaged in storage.

Metalworking Hand Tools: Hack saws should have the blade installed with the teeth facing forward, and apply pressure on the forward stroke. Use a light pressure to avoid twisting and breaking the blade. Metal files need to be kept clean and protected from damage. Hitting the file against a hard object to clean it can damage the file - use a file card for cleaning.

RESPECT PORTABLE POWER TOOLS



Saws: The circular saw is a heavy-duty tool with interchangeable blades for all types of woodcutting. The saber saw is somewhat smaller and used for smaller woodcutting jobs and curved cuts. A chainsaw may be either gasoline or electrically powered. Before cutting, inspect the material to be cut for nails or foreign objects. Make sure blade guards are in place and working properly. Stay alert! Saws are noisy and the sound may drown out warning shouts or instructions. Wear goggles or goggles with a face shield to protect you from flying debris or sawdust. Inspect the blade regularly. First, turn the saw off and unplug it. Don't use dull or loose blades. Don't overload the motor by pushing too hard or cutting material that is too heavy. Be sure you have firm footing and balance when using any saw. Slips or falls can be deadly when you're holding a power tool.

Drills: Variable speed drills are versatile tools used for boring holes, turning screws, buffing, and grinding. Select the correct drill bit for the job to be done. Use only sharp bits. Make sure the material being drilled is secured or clamped firmly. Hold the drill firmly and at the correct angle. Don't force it to work or lean on it with all your strength. Always remove the bit from the drill when you're finished. Use a drill bit sharpener to maintain the cutting edge on drill bits.

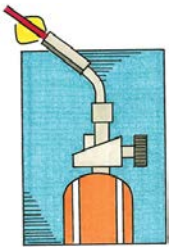
Grinding Wheels: Bench grinders are useful for sharpening, shaping, and smoothing metal, wood, plastic, or stone. Keep machine guards in place and wear hearing and eye protection. Before use, make sure that wheels are firmly held on spindles and work rests are tight. Stand to one side while starting the motor, until the operating speed is reached - this prevents injury if a defective wheel breaks apart. Use light pressure when you start grinding - too much on a cold wheel may cause failure.

Sanders: Two types of sanders are orbital and belt. Arrange the cord so that it won't be damaged by the abrasive belt. Keep both hands on the tool for good control. Hold onto the sander when you plug it in. Clean dust and chips from the motor and vent holes regularly and lubricate when necessary.

Impact Wrenches: They operate on electricity or compressed air and deliver extra power and torque for fastening and loosening bolts and drilling.

Don't force a wrench to take on a job bigger than it's designed to handle. Don't use standard hand sockets or driver parts with an impact tool. Don't reverse direction of rotation while the trigger is depressed.

Soldering Irons or "Guns": They can be dangerous because of the heat they generate. Handle with care - they can easily cause serious burns. Always assume that a soldering iron is hot. Rest a heated iron on a rack or metal surface. Never swing an iron to remove solder. Hold small soldering jobs with pliers, never in your hand. Wait until the tool is cool before you put it away.



Propane and Gas Torches: These commonly used tools pose fire and heat hazards. Never use a flame to test for propane or gas leaks. Never store the fuel tanks in an unventilated area, and never use a tank with a leaking valve. Use torches in well-ventilated areas. Avoid breathing the vapors and fumes they generate.

Glue Guns: A glue gun can be a real time saver. However, because it generates temperatures as high as 450°F, avoid contact with the hot nozzle and glue.

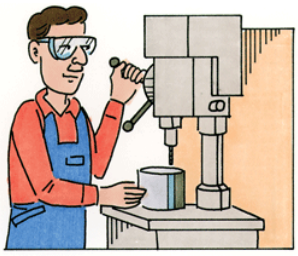
Shop Vacuums: Clean filters regularly and never use your vacuum to pick up flammable liquids or smoldering materials.

USE STATIONARY MACHINERY SAFELY

Table Saw: This saw has a large circular blade used to make a variety of cuts in wood or other material. Never reach over the saw to push stock. Stand slightly to one side, never in line with the saw. A "kickback" occurs when material being cut is thrown back toward the operator. This is one of the greatest hazards in running a table saw. To avoid it:

- Never use a dull blade.
- Don't cut "freehand" or attempt to rip badly warped wood.
- Use the splitter guard.
- Don't drop wood on an unguarded saw.

Radial-Arm Saw: Often called the number one multipurpose saw in the shop, this saw blade is mounted on a moveable head, and slides in tracks or along a shaft. Most have built-in safety devices such as key switches to start them, blade guards, anti-kickback pawls, and blade brakes. The saw and motor should always be returned to the rear of the table against the column after a cut is made.



Drill Press: The stationary drill press is a larger, more powerful version of a portable drill. Clamp or securely fasten the material being drilled whenever possible. Make sure any attachments are fastened tightly.

Power Sanders: Always select the correct grade of abrasive for the job.

Move the work around to avoid heating and burning a portion of the disk, belt, or wood. Remember to use the dust collector if the sander has one.

Shapers: A shaper is used mainly for grooving and fluting woods. It can be dangerous because of its high speed and because the cutters are difficult to guard completely. When using a shaper, avoid loose clothing, wear eye protection, and make sure the cutters are sharp and securely fastened.

Welding Machines: The high-intensity arc of even a small welding machine can cause severe burns. Flame-resistant clothing and hand and eye protection are needed to protect against hot sparks and molten metal. Keep the area around the welding operation clean - hot sparks can start fires.

WORK AT WORKING SAFELY

Proper care and safety when using tools and machinery is vital.

1. Respect your equipment, know the dangers it presents, and take safety precautions necessary to work without injury.
2. Take out only the tools that you will need for the job. Piles of extra tools can get in the way or get lost.
3. Always wear appropriate personal protective equipment.
4. Maintain tools and equipment with regular servicing and good housekeeping practices. Putting tools away after use keeps them from getting damaged or disappearing.
5. If you don't know how to use a particular tool, don't be afraid to admit it. Find someone who does and learn from an experienced worker.
6. Carry your tools safely. Use a tool box or a tool chest to move tools around. If you need to carry tools, especially on a ladder, wear a tool belt.