NC Employees Workplace Program Requirements for Safety and Health

Hand and Portable Power Tools

Scope

The purpose of this safety requirement and procedure is to establish guidelines and accountability for state employees using hand and portable power tools.

Background

Hand and portable power tools improve employee efficiency in job performance. The safety objective with these tools is to protect users from inflicting harm on themselves and others. Although it is generally assumed that anyone knows how to use common hand tools, hand tool accidents contribute significantly to compensable disabling injuries. Proper selection, use, care, and supervision of hand and portable power tools can prevent abuse or misuse of these tools and eliminate or reduce employee injuries.

This safety requirement and procedure provides guidelines for the use of hand and portable power tools. It includes provisions for training and lists the general requirements for all tools. Additionally, it presents specifics on hand tool use, types of portable power tools, and the hazard controls for portable power tools. This document also provides the general requirements for Personal Protective Equipment (PPE) and tool storage.

Requirements

This safety requirement and procedure is established in accordance with:


Definitions

Hand Tools: Tools that are manually operated and powered by human force such as screw drivers, pliers, wrenches, and cutting shears, etc.

Pneumatic Tools: Tools that are manually operated and powered by air, such as air wrenches, air grinders, spray guns, and air fasteners.

Power Tools: Tools that are manually operated and powered by electricity, air, gasoline, diesel, or explosives.

UL Listed: Tools listed by Underwriters’ Laboratory

General Provisions

This section details the provisions of this safety requirement and procedure with each provision discussed in a separate subsection. These provisions are:

- Training
- General Requirements For All Tools
- Use of Hand Tools
- Hazard Controls For Portable Power Tools
- Personal Protective Equipment (PPE)
- Storage
NC Employees Workplace Program Requirements for Safety and Health

- Portable Power Tools

**Training**

An effective tool use program should include training in safe work practices to reduce tool injuries and control accidents. For hand tools, employees should be trained in:

- Selecting the right tool for the job
- Knowing the hazards of the tool
- Using tools correctly
- Maintaining tools
- Having a regular tool inspection procedure
- Storing tools properly
- Choosing/using the correct PPE for the job

Employees who use portable power tools shall be trained in:

- Selecting the right tool for the job
- Knowing the hazards of the tool
- Using tools correctly
- Disconnecting the power before changing accessories
- Following manufacturer’s operating and inspection rules
- Having guards in place
- Maintaining tools
- Storing tools properly
- Choosing/using the correct PPE for the job

This training shall be performed upon initial employment and/or job reassignment. Periodic refresher training shall also be conducted at the discretion of the supervisor.

**General Requirements for All Tools**

- All hand and portable power tools supplied by the State or employees of the State will be maintained in safe working order. Keep saws and tools with a blade/cutting edge properly sharpened.
- Always use the right tool for the job.
- Provide and use the right PPE.
- Keep the work area free of tripping hazards.
- Hand tools shall be inspected regularly and before using. Tools or handles that are cracked, broken, or deformed shall be tagged out and removed from service. Impact tools such as wedges, pins, and chisels shall be kept free of mushroomed heads.
- Portable power tools shall be inspected regularly and before using. Tools with missing or broken guards, nicked or frayed electrical cords, broken plugs, broken switches, damaged equipment housing, or missing or broken tool retainer shall not be used and shall be tagged out and removed from service, until repaired.
Use of Hand Tools

- Misuse of common hand tools such as screwdrivers, hammers, punches, cutting tools, tap and die tools, saws, files, hands snips and cutters, wood chisels, axes, hatchets, knives, shovels, and rakes is a source of many injuries. Supervisors may mistakenly assume that everyone knows the proper use of common hand tools.

- Appendix A presents specific safe work practices for hand tools in the following major hand tool categories:
  - Metal-Cutting Hand Tools
  - Wood-Cutting Tools
  - Miscellaneous Cutting Tools
  - Torsion Tools
  - Shock Tools
  - Spark-Resistant Tools

Tool safeguards are generally accomplished through a number of safety features found on tools. Safety features such as tool guards and handle design can help prevent injuries.

Portable Power Tools

Portable power tools are divided into 3 primary groups according to their power source:

- Electrical
- Air-Powered
- Special Powered

**Electrical tools** include (but are not limited too) drills, circular saws, reciprocating saws, miter-box and chop saws, jig/saber saws, rotary die grinders, soldering irons, percussion tools, grinding wheels, buffers, wire brushes, sanders, and routers. Employees must recognize and protect themselves from shock, noise, cuts, burns, and other potential hazards by using proper guards, PPE, and other safety devices.

**Air-powered tools** include air hoses, grinders, and pneumatic-impact tools. Workers should ensure hoses do not present tripping hazards, avoid using hoses as cleaners, and prevent accidental disconnection of hoses from the tools. Air-powered grinders require the same type of guarding as electrical grinders.

**Pneumatic-impact tools** (nailers, drills, impact wrenches, staplers, jackhammers, etc.) require two safety devices: an automatically closing valve and a retaining device to hold the tool in place to prevent it from being fired accidentally. Additionally, employees must check noise levels to determine if hearing protection is needed and guard their eyes against flying debris.

**Special powered tools** include hydraulic, gasoline-powered, and powder-actuated equipment:

- **Hydraulic tools** cause injuries because high pressure leaks or ruptures in hoses may force oil under the skin of employees’ hands or arms.
- **Gasoline-powered tools** are commonly used in logging and construction activities. The chain saw, mowers, trimmers, and other various gasoline-powered tools are used.
Powder-actuated tools are commonly used for fastening fixtures and materials to metal, precast or pre-stressed concrete, masonry block, brick, stone, and wood surfaces. Blank cartridges provide the energy and are ignited by a percussion primer.

Gasoline-powered and powder-actuated tools present serious hazards and must be operated only by trained personnel and adequately guarded to prevent fires and injuries. Similar precautions must be used for impact wrenches as well as any electrical or hydraulic equipment.

### Hazard Controls for Portable Power Tools

Portable power tools are designed for particular tasks and if used for other purposes other hazards may be created. Additionally, the extreme mobility of these tools and their power sources creates significant hazards.

Therefore, controls should be in place to minimize or eliminate the hazards associated with portable power tools. The commonly used controls on portable power tools include:

- **Start switch lockouts**
- **Interlocks**
- **Dead man switches**
- **Vibration minimization (as applicable)**
- **Tool guards**
- **Safeguarding energy sources**

**Start switch lockouts** prevent inadvertent operation. A tool cannot operate until a keyed switch selects the operating mode.

**Interlocks** on tools protect operators and others. For example, a riding mower has a switch under the operator’s seat that shuts off the blades or engine when the operator stands up.

**Dead man switches** shut off power to the tool when the switch is released. Drills, saws, mowers, hedge trimmers, and other portable power tools have these controls.

**Vibration minimization** is usually a tool design function. If extreme vibration of the tool is a problem to the employee, using isolation pads within the machine or between the handles and operator may be an option. Extreme tool vibration over time may cause nerve damage in one’s hands and/or wrists.

**Tool guards** should be provided where possible. Tools such as circular saws, belt sanders, and abrasive wheel grinders should be equipped with guards that effectively prevent the hands and fingers of the operator from coming into contact with blades and nip points. **Guarding** may not be possible on some equipment such as chain saws. In those cases, other safety features should be in place (e.g. chain brake, anti-kickback design, etc.).

**Safeguarding energy sources** must be practiced with all the power tools. Electrical safeguards, controls for handling gasoline and other flammable liquids, and controls for air and fluids under pressure must all be in place.

**Appendix B** details selected portable power tools safe practices. These practices include hazard control techniques and should be followed by employees who use these types of tools.
Personal Protective Equipment

Employees using hand and power tools are to be provided with Personal Protective Equipment (PPE) when exposed to falling, flying, abrasive, and splashing objects, or harmful dusts, fumes, vapors, or gases.

The PPE should be matched against the particular hazard to provide the required level of protection. See 29 CFR 1910.132, Personal Protective Equipment, for details on matching PPE against the particular hazard.

Storage

Hand and portable power tools shall be stored on racks, tool cribs, or bins. Tools shall be stored in such a manner that sharp edges do not protrude out of tool cribs or bins, or damage other tools. Each day, tool storage areas should be locked with a complete audit of all tools.

Special tools may require unusual storage. See manufacturer’s instructions for those requirements. For example, powder-actuated hand tools should be stored under lock and key.

Appendix A  Selected Hand Tools Safe Work Practices:

Metal-Cutting Hand Tools

Chisels

Factors determining the selection of a cold chisel are the materials to be cut, the size and shape of the tool, and the depth of the cut to be made.

The chisel should be made heavy enough so that it will not buckle or spring when struck.

A chisel large enough only for the job should be selected so that the blade is used rather than the point or corner. Also, a hammer heavy enough to do the job should be used.

Employees shall wear safety goggles when using a chisel and should set up a shield or screen to prevent injury to other workers from flying chips. If a shield does not afford positive protection to all exposed employees, then glasses with side protection should be worn.

Tap and Die Work

Tap and die work requires certain precautions. The work should be firmly mounted in the vise. Only a T-handle wrench or adjustable tap wrench should be used. When threads are being cut with a hand die, hands and arms should be kept clear of the sharp threads coming through the die and metal cuttings should be cleared away with a brush.

Hack Saws

Hack saws should be adjusted in the frame to prevent buckling and breaking, but should not be tight enough to break off the pins that support the blade. Install blade with teeth pointing forward.
Pressure should be applied on the forward stroke not on the back stroke. If the blade is twisted or too much pressure is applied, the blade may break and cause injury to the hands or arms of the user.

**Files**

Selection of the right kind of file for the job will prevent injuries and lengthen the life of the file. Inasmuch as the extremely hard and brittle steel of the file chips easily, the file should never be cleaned by being struck against a vise or other metal object. A file-cleaning card or brush should be used.

For the same reason, a file is not to be hammered or used as a pry. Such abuse frequently results in the file's chipping or breaking causing injury to the user. A file should not be made into a center punch, chisel, or any other type of tool because the hardened steel may fracture in use.

A file is never to be used without a smooth, crack-free handle; if the file should bind, the tang may puncture the palm of the hand, the wrist, or other part of the body. Under some conditions, a clamp-on raised offset handle may be useful to give extra clearance for the hands. Files are not to be used on lathe stock turning at high speed (faster than three turns per file stroke) because the end of the file may strike the chuck, dog, or face plate and throw the file (or metal chip) back at the operator hard enough to inflict serious injury.

**Tin Snips**

Tin snips should be heavy enough to cut the material so easily that the worker needs only one hand on the snips and can use the other to hold the material. The material is to be well supported before the last cut is made so that cut edges do not press against the hands.

Jaws of snips are to be kept tight and well lubricated.

Employees shall wear safety goggles when cutting steel banding on packaged goods, or when trimming corners or slivers of metal because steel banding is under tension and can spring up at one’s face after cutting, and small particles often fly with considerable force when trimming. Employees shall always wear cut-resistant (Leather) gloves, when using tin snips.

**Cutters**

Cutters used on wire, reinforcing rods, or bolts should have ample capacity for the stock; otherwise, the jaws may be sprung or spread. Also, a chip may fly from the cutting edge and injure the user.

Cutters require frequent lubrication. To keep cutting edges from becoming nicked or chipped, cutters are not to be used as nail pullers or pry bars.

Cutter jaws should have the hardness specified by the manufacturer for the particular kind of material to be cut. By adjustment of the bumper stop behind the jaws, cutting edges are to be set to have a clearance of 0.003 inch when closed. Safety goggles must also be worn when using cutters.
NC Employees Workplace Program Requirements for Safety and Health

Wood-Cutting Hand Tools

Edge tools are to be used so that if a slip should occur, the direction of force will be away from the body. For efficient and safe work, edge tools are to be kept sharp and ground to the proper angle. A dull tool does a poor job and may stick or bind.

Wood Chisels

Inexperienced employees shall be instructed in the proper method of holding and using chisels. Handles are to be free of splinters.

The wood handle of a chisel struck by a mallet is to be protected by a metal or leather cap to prevent it from splitting.

The work to be cut must be free of nails to avoid damage to the blade or cause a chip to fly into the user's face or eye. Safety goggles must be worn when using chisels, too.

Saws

Saws should be carefully selected for the work they are to do. For crosscut work on green wood, a coarse saw (four to five points per inch) is to be used. A fine saw is better for smooth, accurate cutting in dry wood. Saws are to be kept sharp and well set to prevent binding.

Axes

An ax person is to make sure that there is a clear circle in which to swing the ax before starting to chop. Also, all vines, brush, and shrubbery within the range should be removed, especially overhead vines that may catch or deflect the ax.

The user, and all others in the work area must wear safety goggles, a hard hat, and safety shoes/boots.

Ax blades shall be protected with a sheath or metal guard wherever possible. When the blade cannot be guarded, it is safer to carry the ax at one's side. The blade on a single-edged ax shall be pointed down.

Inspect the ax prior to each use. If the cutting edge is chipped or cracked, or if the handle is damaged, splintered, cracked, or loose in the head, take it out of service (tag-out) until repaired.

Hatchets

Hatchets shall not be used for striking hard metal surfaces, since the tempered head may injure the user or others by flying chips. Using a hatchet to drive nails is prohibited. When using a hatchet in a crowded area, employees shall take special care to prevent injury to themselves and others; wear safety goggles, a hard hat, and safety shoes/boots. If the area is too crowded to safely swing a hatchet, do not use the hatchet in that area.
NC Employees Workplace Program Requirements for Safety and Health

Miscellaneous Cutting Tools

Planes, Scrapers, Bits, and Drawknives

Planes, scrapers, bits, and drawknives are to be used only by experienced employees. These tools are to be kept sharp and in good condition.

The principal hazard in the use of knives is that the hands may slip from the handle onto the blade or that the knife may strike the body or the free hand. A handle guard or a finger ring (and swivel) on the handle eliminates these hazards. Adequate guarding is important.

Employees who must carry knives with them on the job shall keep them in sheaths or holders. Never carry a sheath knife on the front part of a belt - always carry it over the right or left hip, toward the back. This will prevent severing a leg artery or vein in case of a fall.

Knives must never be left lying on benches or in other places where they may cause hand injuries. Safe placement and storage of knives is important to knife safety.

Supervisors must ensure that employees who handle knives have ample room in which to work so they are not in danger of being bumped by other workers.

Supervisors should be particularly careful about the hazard of employees leaving knives hidden under a product, scrap paper, or wiping rags, or among other tools in work boxes or drawers. Knives are to be kept separate from other tools to protect the cutting edge of the knife as well as to protect the employee.

Horseplay shall be prohibited around knife operations. Throwing, "fencing," trying to cut objects into smaller and smaller pieces, and similar practices are not only dangerous but reflect inadequate supervision.

Supervisors shall ensure that nothing is cut that requires excessive pressure on the knife. Knives shall not be used as a substitute for can openers, screwdrivers, or ice picks.

Torsion Tools

Socket wrenches are safer to use than adjustable or open-end wrenches.

Open-End or Box Wrenches

Open-end or box wrenches shall be inspected to make sure that they fit properly and are never to be used if jaws are sprung or cracked. When defective, they shall be taken out of service. 6-point box wrenches are best if “swing” is not an issue. They are least likely to round-off a bolt head or nut and slip off, causing an injury.

Socket Wrenches

Socket wrenches give great flexibility in hard-to-reach places. The use of special types shall be encouraged where there is danger of injury. 6-point socket wrenches are best. They are least likely to round-off a bolt head or nut and slip off, causing an injury.
NC Employees Workplace Program Requirements for
Safety and Health

Adjustable Wrenches

Adjustable wrenches are used for many purposes. They are not intended, however, to take the place of standard open-end, box or socket wrenches. They are used mainly for nuts and bolts that do not fit a standard wrench. Pressure is always applied to the fixed jaw.

Pipe Wrenches

Pipe wrenches, both straight and chain tong, shall have sharp jaws and be kept clean to prevent slipping.

The adjusting nut of the wrench is to be inspected frequently. If it is cracked, the wrench shall be taken out of service. A cracked nut may break under strain, causing complete failure of the wrench and possible injury to the user.

A piece of pipe "cheater" slipped over the handle shall not be used to give added leverage because this can strain a pipe wrench to the breaking point. The handle of every wrench is designed to be long enough for the maximum allowable safe pressure.

A pipe wrench should never be used on nuts or bolts because the corners will break the teeth of the wrench making it unsafe to use on pipe and fittings. Also, a pipe wrench, when used on nuts and bolts, damages their heads. A pipe wrench shall not be used on valves, struck with a hammer, nor used as a hammer.

Pliers

Side-cutting pliers sometimes cause injuries when short ends of wires are cut. A guard over the cutting edge and the use of safety glasses will help prevent eye injuries.

The handles of electricians' pliers are to be insulated. In addition, the electricians shall wear the proper electrical rated gloves if they are to work on energized lines.

Pliers shall not be used as a substitute for a wrench.

Special Cutters

Special cutters include those used for cutting banding wire and strap. Claw hammers and pry bars shall not be used to snap metal banding material.

Pipe Tongs

Employees must neither stand nor jump on the tongs nor place extensions on the handles to obtain more leverage. They should use larger tongs.

Screwdrivers

The practice of using screwdrivers for punches, wedges, pinch bars, or pries shall not be allowed.

Cross-slot (Phillips-head) screwdrivers are safer than the square bit type because they have less tendency to slip. The tip must be kept clean and slightly blunted however, to permit a good grip on the head of the screw.
The part to be worked upon must never be held in the hands; it should be laid on a bench or flat surface, or held in a vise.

No screwdriver used for electrical work shall have the blade or rivet extending through the handle. Both blade and handle shall be insulated except at the tip.

**Shock Tools**

**Hammers**

A hammer is to have a securely wedged handle suited to the type of head used. The handle shall be smooth, without cracks or splinters, free of oil, shaped to fit the hand, and of the specified size and length.

Employees shall be warned against using a steel hammer on hardened steel surfaces. Instead, a soft-head hammer or one with a plastic, wood, or rawhide head should be used. Safety goggles or safety glasses shall be worn to protect against flying chips, nails, or scale.

**Riveting Hammers**

Riveting hammers, often used by sheet metal workers, must have the same kind of use and care as ball peen hammers and should be watched closely for cracked or chipped faces.

**Carpenter's Nail or Claw Hammers**

The faces shall be kept well dressed at all times to reduce the hazard of flying nails while they are being started into a piece of wood. A checker-faced head is sometimes used to reduce this hazard.

Nail hammers shall not be used to strike hard or hardened objects such as rocks, concrete, masonry nails, chisels, hatchets, axes, splitting wedges, mauls, other hammers, or other steel tools.

No area, section, or portion of the hammer shall be ground, welded, treated by reheating, or otherwise altered from the original condition as furnished by the manufacturer.

Hammer heads shall be inspected prior to each use, and their use discontinued at the first sign of chipping, mushrooming, or cracking of any portion.

Handles shall be inspected prior to each use. They shall be free of splinters or cracks, and shall be tight in the head. Those damaged or loose shall be replaced.

Eye protection shall be worn by all nailers and all employees working in the immediate area.

**Spark-Resistant Tools**

Spark-resistant tools of nonferrous materials are sometimes advised for use where flammable gases, highly volatile liquids, and explosive materials are stored or used. The intensified sparks from steel tools are capable of igniting substances such as gasoline, gunpowder, lint, TNT, carbon disulfide, and ethyl ether.
In certain circumstances, steel coated with aluminum paint can emit sparks when struck with a metal striker (steel, brass, or spark-resistant alloys) and such sparks may ignite mixtures of flammable gases or vapors in air.

Nonferrous tools greatly reduce the hazard from sparking, but do not eliminate it. They must be inspected before each use to be certain that they have not picked up foreign particles which could produce friction sparks.

**Electric Tools**

Insulating platforms, rubber mats, and rubber gloves provide an additional factor of safety when tools are used in wet locations, such as in tanks, in boilers, and on floors. But the safest use of power tools in wet/damp locations, is to plug them into a GFCI outlet in addition to using the insulating devices above, or just use battery-operated (cordless) tools.

Only tools in good repair and listed by Underwriters' Laboratories shall be used.

Protection from electric shock while using portable power tools has been described as depending upon third wire protective grounding. "Double insulated" tools provide more reliable shock protection without third wire grounding. Tools in this category are permanently marked by the words "double insulation" or "double insulated", or the “square-within-a-square” logo.

Double insulated or all-insulated tools do not require separate ground connections; the third wire or ground wire is to be used wherever it is supplied as indicated to be part of the tool’s electrical connection.

Failure of insulation is harder to detect than worn or broken external wiring. This illustrates the need for frequent inspection and thorough maintenance. Care in handling the tool and frequent cleaning will help prevent the wear and tear that cause defects.

Double insulated tools shall not be operated on wet surfaces.

All electric power tools shall be effectively grounded except the double insulated and cordless types.

Electric cords shall be inspected periodically and kept in good condition. Heavy-duty plugs that clamp to the cord should be used to prevent strain on the current-carrying parts if the cord is accidentally pulled. Tools must not be carried by their line cords.

Although no guards are available for drill bits, some protection is afforded if drill bits are carefully chosen for the work to be done, such as being no longer than necessary to do the work.

Electric saws are usually well guarded by the manufacturer, but employees must be trained to use the guard as intended. The guard should be checked frequently to be sure that it operates freely and encloses the teeth completely when it is not cutting and encloses the unused portion of the blade when it is cutting.

Circular saws shall not be jammed or crowded into the work. The saw is to be started and stopped outside the work.
NC Employees Workplace Program Requirements for Safety and Health

Disconnect the tool line cord when not in use, before servicing, or when changing the tool’s accessories (blades, chains, drill bits, etc.).

Secure the work with a vice whenever possible, so both hands are free to operate the tool safely.

Keep your work area clear of tripping hazards.

Secure your footing, and keep your balance while working.

Always wear the proper PPE.

**Abrasive Wheels and Tools**

All grinding machines shall be supplied with sufficient power to maintain the spindle speed at safe levels under all conditions of normal operation.

Grinding machines must be equipped with safety guards in conformance with the requirements of American National Standards Institute, B7.1, Safety Code, for the Use, Care, and Protection of Abrasive Wheels.

Floor-stand and bench-mounted abrasive wheels, used for external grinding, shall be provided with safety guards (protection hoods). The maximum regular exposure of the grinding wheel periphery and sides shall be not more than 90 degrees, except when work requires contact with the wheel below the horizontal plane of the spindle, the angular exposure shall not exceed 125 degrees.

Floor-stand and bench-mounted grinders shall be provided with work (tool) rests and tongue guards which are rigidly supported and readily adjustable. Such work (tool) rests shall be kept at a distance not to exceed ⅛ inch from the surface of the wheel, and the tongue guards kept at a distance not to exceed ¼ inch from the surface of the wheel.

Cup-type wheels used for external grinding shall be protected by either a revolving-cup guard or a band-type guard. All other portable abrasive wheels used for external grinding shall be provided with safety guards (protection hoods), except as follows:

When the work location makes it impossible, a wheel equipped with safety flanges shall be used.

When wheels two inches or less in diameter which are securely mounted on the end of a steel mandrel are used.

Portable abrasive wheels used for internal grinding shall be provided with safety flanges (protection flanges) except as follows:

When wheels two inches or less in diameter, which are securely mounted on the end of a steel mandrel are used, if the wheel is entirely within the work being ground while in use.

When safety guards are required, they shall be so mounted to maintain proper alignment with the wheel, and the guard and its fastenings shall be of sufficient strength to retain fragments
of the wheel in case of accidental breakage. The maximum angular exposure of the grinding wheel periphery and sides shall not exceed 180 degrees.

Surface grinders used for external, horizontal grinding, shall be provided with safety guards (protection hoods), whose maximum regular exposure of the grinding wheel periphery and sides shall be not more than 150 degrees. This exposure shall begin at a point not less than 15 degrees below the horizontal plane of the wheel spindle.

When safety flanges are required, they shall be used only with wheels designed to fit the flanges. Only use safety flanges of a type and design and properly assembled so as to ensure that the pieces of the wheel will be retained in case of accidental breakage.

All abrasive wheels shall be closely inspected and ring-tested before mounting to ensure that they are free from cracks and defects.

Grinding wheels shall fit freely on the spindle and shall not be forced into place. The spindle nut shall be tightened only enough to hold the wheel in place.

All employees using abrasive wheels shall use the proper PPE to protect their eyes.

**Pneumatic Power Tools**

The operating trigger on portable hand-operated utilization equipment shall be located to minimize the possibility of its accidental operation, and shall be arranged to close the air inlet valve automatically when the pressure of the operator's hand is removed.

The pneumatic power tool’s hose shall be secured to the tool by some positive means to prevent “hose whip” in the event the hose becomes accidentally disconnected.

Safety clips or retainers shall be securely installed and maintained on pneumatic impact (percussion) tools to prevent attachments from being accidentally expelled.

All pneumatically driven nailers, staplers, and other similar equipment provided with automatic fastener feed, which operate at more than 100 p.s.i. pressure at the tool, shall have a safety device on the muzzle to prevent the tool from ejecting fasteners, unless the muzzle is in contact with the work surface.

Compressed air shall not be used for cleaning purposes except with an air blow gun limited to 30 p.s.i. static pressure at the outlet nozzle and then only with effective chip guard in place and the proper PPE.

The manufacturer's safe operating pressure for hoses, pipes, valves, filters, and other fittings shall not be exceeded.

The use of hoses for hoisting or lowering tools shall not be permitted.

All hoses exceeding ½ inch inside diameter shall have a safety device at the source of supply or line to reduce pressure in case of hose failure.

Airless spray guns of the type which atomize paints and fluids at high pressures (1,000 pounds or more per square inch) shall be equipped with automatic or visible manual safety
devices which will prevent pulling of the trigger to prevent release of the paint or fluid until the safety device is manually released.

In lieu of the previous, a diffuser net which will prevent high pressure, high velocity release, while the nozzle tip is removed, plus a nozzle tip guard which will prevent the tip from coming into contact with the operator, or other equivalent protection shall be provided.

**Gasoline-Powered Tools**

All gasoline-powered tools shall be stopped while being refueled, serviced, or maintained, and fuel shall be transported, handled, and stored in approved metal safety cans, no larger than 5 gallons. All cans shall be properly labeled.

Leakage or spillage of flammable or combustible liquids shall be disposed of promptly and safely.

When gasoline-powered tools are used in enclosed spaces, the applicable requirement for concentrations of toxic gases and use of (PPE) shall apply.

When refueling gasoline-powered tools, use a bonding strap (stranded wire with an alli-gator clip on each end) to bond the metal safety can to the metal frame of the tool. This will reduce/eliminate any potential static build-up during the refueling process.

**Hydraulic-Powered Tools**

The fluid used in hydraulic-powered tools shall be fire-resistant and shall retain its operating characteristics at the most extreme temperatures to which it will be exposed.

The manufacturer's safe operating pressures for hoses, valves, pipes, filters, and other fittings shall not be exceeded.

Inspect these tools at least monthly; checking for leaks, broken or cracked lines and fit-tings, and proper operation of all controls.

**Powdered-Actuated Tools**

Only employees who have been trained in the operation of the particular tool in use shall be allowed to operate a powder-actuated tool.

The tool shall be tested each day before loading to see that safety devices are in proper working condition. The method of testing shall be in accordance with the manufacturer's recommended procedure.

Any tool found not in proper working order or one that has developed a defect during use shall be removed from service immediately, tagged out, and not used until properly re-paired.

Adequate eye, head, face, and/or PPE as necessitated by working conditions shall be utilized by the operators and persons working in the area.
The tool shall be designed so that it cannot be fired unless it is equipped with a standard protective shield or guard or a special shield, guard, fixture, or jib.

The firing mechanism shall be designed so that the tool cannot fire during loading, preparation to fire, or if the tool is dropped while loaded.

Firing of the tools shall be dependent upon at least two separate and distinct operations of the operator, with the final firing movement being separate from the operation of bringing the tool into the firing position.

The tool shall be designed so as not to be operable other than against a work surface and unless the operator is holding the tool against the work surface with a force at least five pounds greater than the weight of the tool.

The tool shall be designed so that it will not operate when equipped with the standard guard indexed to the center position if any bearing surface of the guard is tilted more than eight degrees from contact with the work surface.

The tool shall be designed so that positive means of varying the power are available or can be made available to the operator as part of the tool or as an auxiliary to facilitate selection of a power level adequate to perform the desired work without excessive force.

The tool shall be designed so that all breeching parts will be reasonably visible to allow a check for any foreign matter that may be present.

Tools shall not be loaded until just prior to the intended firing time. Neither loaded nor empty tools are to be pointed at any employees. Hands shall be kept clear of the open barrel end.

Fasteners shall not be driven into very hard or brittle materials including, but not limited to, cast iron, glazed tile, surface-hardened steel, glass block, live rock, face brick, or hollow tile.

Loaded tools shall not be left unattended.

Driving into materials easily penetrated shall be avoided unless such materials are backed by a substance that will prevent the pin or fastener from passing completely through and creating a flying missile hazard on the other side.

No fastener shall be driven into a spalled area caused by an unsatisfactory fastening.

Power-assisted, hammer-driven tools are used for the same purposes as powder-actuated tools and generally the same precautions are to be followed.

Woodworking Tools

All employees using woodworking tools shall be protected by proper eye protection.

All portable, power-driven circular saws shall be equipped with guards above and below the base plate or shoe. The upper guard shall cover the saw to the depth of the teeth, except for the minimum arc required to permit the base to be tilted for beveled cuts. The lower guard shall cover the saw to the depth of the teeth, except for the minimum arc required to allow
proper retraction and contact with the work. When the tool is withdrawn from the work, the lower guard shall automatically and instantly return to the covering position.

All "fixed" power driven woodworking tools shall be provided with a disconnect switch that can either be locked or tagged in the "off" position.

Automatic feeding devices shall be installed on machines whenever the nature of the work will permit. Feeder attachments shall have the feed rolls or other driven moving parts covered or guarded so as to protect the operator from hazardous points.

The operating speed shall be etched or otherwise permanently marked on all circular saws over 20 inches in diameter or operating at over 10,000 peripheral feet per minute. Any saw so marked shall not be operated at a speed other than that marked on the blade.

**Resources**

- OSHA for General Industry, Definitions
- OSHA for General Industry, Hand and Portable Powered Tools and Equipment
- OSHA for General Industry, Guarding of Portable Powered Tools
- OSHA for General Industry, Other Portable Tools and Equipment
- OSHA for the Construction Industry, General Requirements
- OSHA for the Construction Industry, Hand Tools
- OSHA for the Construction Industry, Power-operated Hand Tools
- OSHA for the Construction Industry, Abrasive Wheels and Tools
- OSHA for the Construction Industry, Woodworking Tools
- OSHA for the Construction Industry, Jacks-Lever and Ratchet, Screw and Hydraulic