

## Goal

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This publication provides information on safety procedures for hand and power tools.

## Objectives

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Operators of hand and power tools will learn safe operating techniques.

## Background

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Many workplace accidents, injuries and fatalities are caused by the improper use of hand and power tools. This publication emphasizes the importance of proper safeguards while using hand and power tools. Common violations cited by the Occupational Safety and Health Administration (OSHA) are improperly adjusted guards on grinders; grinding wheels not rated for the speed of the grinder; no protection from rotating parts; no training for explosive-actuated tools; and mortar mixers not properly guarded. Rules for hand and power tool use in general industry are found in *29 Code of Federal Regulations 1910 Subpart P, 'Hand and Portable Power Tools and Other Hand-Held Equipment'*. Rules for the construction trades are in *29 CFR 1926 Subpart I, 'Tools – Hand and Power'*.

## Requirements

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### Condition

Employers are responsible for the safe condition of all tools in the workplace, including those furnished by their employees. See to it that maintenance is performed on a regular basis and according to manufacturer's specification. A written preventative maintenance schedule is an example of best business practice.

### Hand Tools

Use the right tool for the job. Wrenches are not hammers; knives are not screwdrivers. Wrenches shall not be used when jaws are sprung to the point that slippage occurs. Impact tools shall be kept free of mushroomed heads. Wooden handles on tools shall be kept free of splinters and cracks and shall not be used if they have become loose.

## Portable Power Tools

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### Electric Tools

All electric tools must be double insulated or grounded with a grounding prong. If the prong is missing, do not use the tool. Electric cords must never be used for hoisting or lowering tools. Replace cords that have damaged insulation. Don't tape over the damage.

### Pneumatic Tools

All pneumatic tools must be secured to the air supply hose or whip to prevent disconnecting. Never carry tools by the hose. Clips or retainers must secure all attachments used on these tools to prevent them from being expelled from the tool. A muzzle safety must be provided on pneumatic nailers or staplers when they operate at or above 100 pounds per square inch (PSI) to prevent the tool from activating unless it is in contact with the work surface. **Never** use compressed air above 30 PSI for cleaning purposes and then only with effective chip guarding and personal protective equipment.

### Fuel-powered Tools

Proper fueling procedures, including equipment shutdown, must be followed when using fuel-powered tools. Adequate ventilation and personal protective equipment must be used to protect employees from toxic fumes given off by this type of equipment.

### Hydraulic Tools

All fluids used in hydraulic tools must be fire resistant. All manufacturer's operating procedures must be followed.

### Explosive-actuated Fastening Tools

All operators must be trained in the use of these tools. Conduct daily tests to verify that all safety devices are working. Operators must always use the correct shield or guard for the tool and wear the proper protective equipment. Defective tools must be removed from service immediately. Tools must never be loaded until just before use.

Never point one at a person. Never leave a loaded tool unattended. Never use one in an explosive or flammable environment. These tools must never be used on very hard or brittle materials such as cast iron. When working with soft materials, use a backing to avoid over-penetration.

### Abrasive Wheel Tools

When you are using abrasive wheel tools make sure all proper guards are in place and correctly adjusted. Adjust tool work rests

so that the maximum clearance between the rest and the wheel does not exceed 1/8 inch.

Wear sufficient eye protection for the job. Make sure the wheel is rated for the speed of the motor. Inspect wheels for defects using the 'ring test.' Hold the wheel with one finger through the center hole and strike it with a wooden or hard plastic screwdriver handle at a point 45 degrees from the vertical centerline and between 1 or 2 inches from the outer rim. A wheel in good condition will give a clear, metallic ring; a wheel which is damaged will not.

### Switches

The following hand-held tools may be equipped with only a positive on-off switch: platen sanders, disc sanders and grinders with wheels that are two inches or less in diameter, routers, planers, laminate trimmers and shears. Also any scroll, saber or jig saws with blade shanks that are ¼ inch wide or less. All other tools must be equipped with a spring-loaded switch that turns off when finger pressure is released.

## Bench and Floor-Mounted Power Tools

### Guarding

All exposed belts, chains, gears, drums, flywheels and any other reciprocating or moving parts must be guarded. Machine guards such as barrier guards, proximity sensors or two-handed tripping devices must be in place when any machine is in use. Guards must also be provided to protect employees from flying chips, sparks, abrasives, splashing, etc. Ventilation fans must be guarded unless they are at least seven feet above the floor. Fan guards must have maximum openings no larger than ½ inch. The point of operation, where work is actually performed or material is processed, shall be guarded if it exposes an employee to injury. Some examples of machines requiring this type of guarding are shears, alligator cutters, power presses, milling machines, forming rollers and calenders. All machines at a fixed location must be securely anchored to prevent walking or moving by contact.

## Woodworking Tools

### Disconnect Switches

All woodworking tools must have a disconnect switch that can either be locked or tagged out in the OFF position.

### Speeds

All circular saws over 20 inches in diameter or operating at over 10,000 peripheral feet per minute must be etched or otherwise permanently marked with the correct operating speed.

### Guarding

All circular saws must be guarded above and below the base plate and the shoe. These guards must immediately return to

the covering position at the end of the cut. Radial saws must have the upper portion of the blade, including the saw arbor, completely enclosed by a hood. The full diameter of the lower exposed portion of the blade must be guarded. The guarding device must automatically adjust itself to the thickness of the stock and remain in contact with the stock during the cut. The portion of a circular, hand-fed rip saw above the material being cut must be completely enclosed by a hood.

## Review

1. What requirement is applicable to all tools?
2. What is the maximum distance allowed between a tool rest and abrasive wheels?
3. What is the maximum PSI allowed when using compressed air for cleaning purposes?
4. What three rules must be followed with loaded explosive-actuated tools?

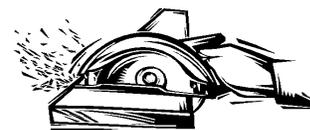
1. Tools must be in a safe condition.
2. One eighth of an inch.
3. Thirty pounds per square inch (PSI).
4. Never load one until just before use. Never point one at a person. Never leave a loaded tool unattended.

Answers

## Resources

The Texas Department of Insurance (TDI), Division of Workers' Compensation (DWC) Resource Center offers a workers' health and safety video tape library. Call (512) 804-4620 for more information or visit our web site at [www.tdi.state.tx.us](http://www.tdi.state.tx.us).

**Disclaimer:** Information contained in this training program is considered accurate at time of publication. For complete information on rules and regulations consult *Code of Federal Regulations 29 1910 and 1926*.



*Safety Violations Hotline*

**1-800-452-9595**

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