

[C\_Officialname]

# Machine Guarding Safety Program – General Industry

Effective Date: [Effective\_Date]

Revision #:

The OSHA logo is displayed in large, white, bold, sans-serif capital letters on a yellow background.

## Reference Standard

Occupational Safety and Health Administration (OSHA); Machinery and Machine Guarding, Subpart O, 29 CFR 1910.211-219

## Purpose

This program is designed to protect employees working with or near machinery. Due to the severity of injuries associated with the hazardous motions of machines, all machinery must be properly guarded through one or more of the methods described in this program.

## Scope

This program applies to all employees, contractors and vendors performing work on company property, and any other individuals who have business with our company.

## Responsibilities

### Management Responsibilities

- Develop and review this program.
- Provide the appropriate employee training.
- Enforce this program.
- Ensure new equipment is properly guarded and an assessment is completed before machines are put into service.
- Correct any machine guarding hazards that are identified.
- Prevent unauthorized employees from operating equipment.
- Ensure safe operating procedures are developed, communicated and available to operators.
- Ensure lockout procedures are in place for all applicable equipment.
- Perform inspections periodically to ensure procedures are being followed.
- Ensure equipment inspection and maintenance programs are completed.
- Review the program at least annually.

### Employee, Contractor and Vendor Responsibilities

- Comply with all procedures outlined in this policy.
- Only operate machines that you are trained and authorized for.
- Ensure safety guards and devices are on machines before operating them.
- Complete any required training.

This policy is merely a guideline. It is not meant to be exhaustive nor be construed as legal advice. It does not address all potential compliance issues with federal, state, local OSHA or any other regulatory agency standards. Employers should customize this document to address all of their legal and contractual obligations, and to account for requirements that are specific to their industry, line of business or project. Consult your licensed Commercial Property and Casualty representative at Reseco Group or legal counsel to address possible compliance requirements. © 2020 Zywave, Inc. All rights reserved.

- Report any and all machine guarding deficiencies, including, but not limited to, missing guards and nonfunctioning safety devices.
- Never remove or bypass a guard or safety device.
- Wear the appropriate personal protective equipment (PPE).
- Avoid wearing loose clothing that could be entangled in machines.
- Use lockout/tagout procedures as needed.
- Follow all posted warning signs.

## Definitions

**Guard:** A physical barrier that prevents access to hazardous areas of a machine.

**Devices:** A safety control that:

- Stops the machine if a part of the body is placed in a hazardous area of the machine
- Prevents the operator from entering a hazardous area of the machine
- Removes the operator's hand from a hazardous area of the machine
- Requires an operator to keep both hands on the controls to prevent them from reaching into a hazardous area of the machine

**Point of operation:** The point of operation is the part of the machine at which the equipment's work is actually being done, whether it be cutting, punching, shearing or bending.

**Power transmission apparatus:** The mechanical components of a machine that transmit energy to the part of the tool performing the work. These components are vital for the smooth operation of a machine and can include flywheels, couplings, belts, pulleys, spindles, cranks, chains, shafts and gears.

**Pinch point:** Any point—other than the point of operation—at which it's possible for a part of the body to get caught between moving parts of a machine or between moving and stationary parts.

## General Requirements

### Machine Guard Requirements

All machine guards must meet the following requirements:

- Prevent machine operators from coming into contact with hazardous or moving parts of a machine while it is in use.
- Be secured. Guards have to be attached to the machine in a way that operators can't easily remove or tamper with the guard (e.g., a tool is required to remove a guard).
- Protect the machine from falling objects. In particular, objects should not be able to fall into the moving parts of the machine.
- Create no new hazards. Guard surfaces should not have unfinished or sharp edges that can cause injuries.
- Avoid interfering with an employee's ability to perform their job.
- Allow for the safe lubrication of the machine. Employees should not have to reach into the hazardous motion of a machine to lubricate it.

## Types of Machine Guards

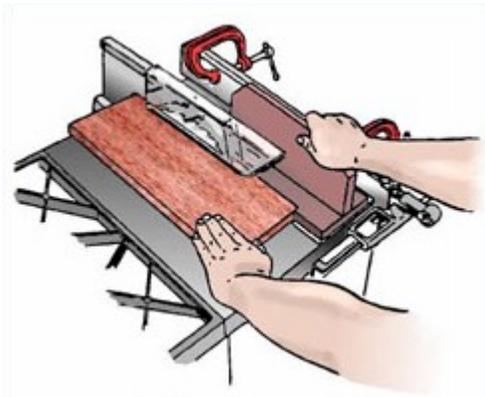
**Fixed guard:** A fixed guard is permanently attached to the machine. This is an effective method for guarding, as it's simple to employ and fully encloses hazardous areas. Fixed guards do have limitations, however, as they can affect visibility and make machine parts difficult to access for repair. A hazardous energy control or lockout procedure is often required if a fixed guard is removed.

**Interlocked guard:** An interlocked guard will power down the machine if it's opened and removed. There is a mechanism that will sense when the guard is opened or removed. Interlocks must be configured so that the machine does not automatically start once replaced. They must also be set up so they cannot be defeated, allowing the machine to continue to run despite the guard being removed.

**Adjustable guard:** Adjustable guards provide barriers that can be changed to allow material to enter the machine's point of operation. It should be noted that these guards must be adjusted depending on the size of material, which means they can fail due to human error. There is very limited use for adjustable guards, but they are commonly found on a bandsaw's point of operation.



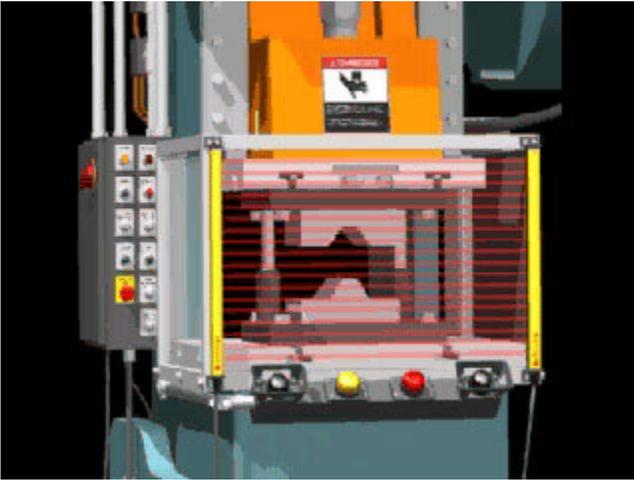
**Self-adjusting guard:** The openings of these guards are determined by the movement of the material being worked on. For example, as the operator moves the material into a hazardous area, the guard is pushed away, providing an opening that is only large enough to admit the material. One example of this type of guard is the spring-hinged guard found on a miter saw. While self-adjusting guards provide some protection, it may still be possible for the operator to unintentionally access the hazardous area.



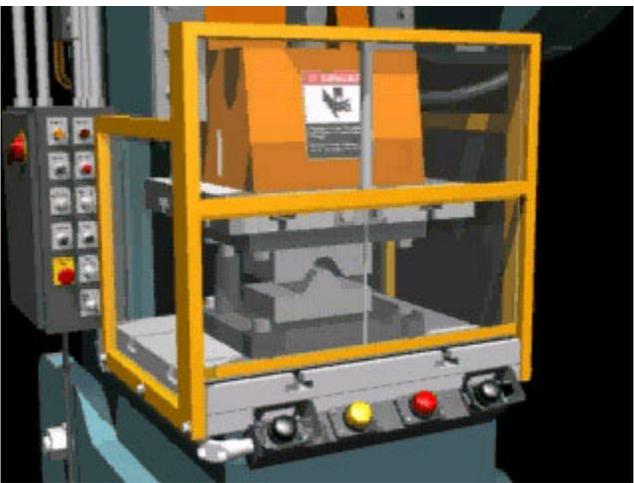
## Types of Safety Devices

Safety devices rely on a control to either keep operators away from the hazardous area of a machine or shut the machine's hazardous motions down. As safety devices don't utilize a physical barrier in the same way machine guards do, proper safety device setup is critical.

**Presence-sensing devices:** A presence-sensing device—often called a light curtain—uses a beam of light that, if broken, will cause the machine to stop. These must be set up in such a way that the machine can be stopped before an employee can reach into the hazardous area of a machine. Presence-sensing devices are commonly used on presses.



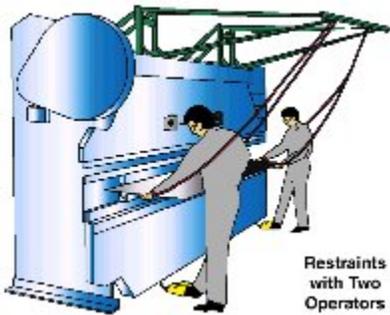
**Gates:** A gate locks in place in front of the point of operation of a press. Gates will not open until the machine has either completed its stroke (Class A Gates) or downstroke (Class B Gates).



**Drop probe:** A drop probe sends a probe prior to a machine cycling. If the probe contacts a foreign object, such as an operator's hand, it will not allow the machine to cycle. Drop probes are commonly used on riveting machines.

**Pressure-sensitive devices:** When depressed, pressure-sensitive devices will shut down a machine. Similar to a presence-sensing device, pressure-sensitive devices must be set up in such a way that the machine can be stopped before an employee can reach into the hazardous area of a machine. They must also be set up so that the operator can't circumvent the device. Common examples of this type of safety device are pressure-sensing mats found in front of machines.

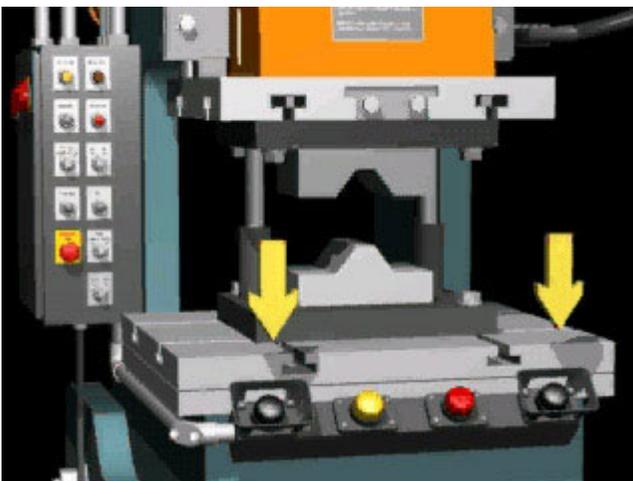
**Restraints:** A restraint device is a system that straps onto an operator's hands in such a way that they are only able to reach a certain distance and not into a machine. Notably, these devices are subject to operator error and can be adjusted improperly, allowing employees to reach into the hazardous area. Restraints also do not provide any protection to employees working nearby.



**Pullbacks:** A pullback system is similar to restraints in that straps are secured to an operator's hands. However, with pullbacks, they are tied into the machine's stroke and will pull the operator's hands out of the machine's point of operation. Pullbacks may be found on a press, but more modern machines will often use other safety devices and guards.



**Two-hand controls:** Two-hand controls require the operator to put constant and concurrent (both buttons pushed at the same time) pressure on controls in order to work a machine. If the operator removes their hands, the machine will stop before the operator can reach in. Two-hand controls must be tested frequently to ensure they are operating properly.



**Two-hand trips:** Two-hand trips are similar to two-hand controls in that they require concurrent activation. However, two-hand trips do not require the operator to hold the controls down. With two-hand trips, the machine must be set up to complete its action before an operator is able to reach into a hazardous area.

## Other Machine Safeguarding Practices

The following risk reductions are not machine guarding in and of themselves, but, when used with properly designed guarding, help ensure a safe machine.

**PPE and clothing:** Machine operations can create flying chips and particles. It may be necessary for employees to wear eye and face protection. Loose clothing and hair can be hazards if caught by moving equipment. Employees must tie back their hair and avoid wearing loose clothing, such a blouse with baggy sleeves or a sweatshirt with long hood strings, that could get caught in machine components.



**Anchoring:** All permanent machines must be anchored to the floor or another secure structure. This helps prevent the machines from tipping or “walking.”



**Access:** Restricting the types of employees who are allowed to be near machines helps reduce hazardous machine exposures. However, this is not a substitute for proper guarding.

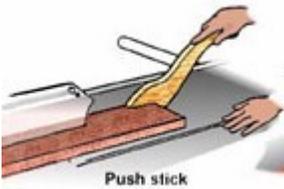
**Awareness barriers:** Awareness barriers can alert or remind employees that they are near a hazardous area. Awareness barriers aren't effective on their own and are not a substitute for machine guarding.

**Control labeling:** Controls should be labeled clearly and permanently. They must also be set up so that the operator can operate the machine safely in a nonhazardous area with good visibility. Controls should be located in a way that does not create ergonomic hazards. Existing standards on control design from organizations should be followed.

**Emergency stop buttons:** An emergency stop button, or e-stop, allows operators to shut down a piece of equipment quickly in the event of an emergency. They should be located in places where an employee can easily access them. Emergency stop buttons are typically red in color and should be appropriately labeled, but they can come in different forms. While the mushroom-shaped button is most common, they can also be a tripwire, cable or bar.

**Control of hazardous energy:** When an employee must enter a hazardous area to repair or service a machine, the machine needs to be powered down. Additionally, the machine's energy source must be locked down to prevent power from accidentally being restored. Together, this is often referred to as lockout/tagout procedures. See our company policies for more information on this practice.

**Push sticks and hand feeding tools:** Push sticks and hand feeding tools are used to reach into a hazardous area. They are not a substitute for guarding, but rather a supplement. Push sticks are typically used around a saw blade. Hand feeding tools are typically used on a press to load material to the point of operation.



**Shields:** Shields are used to stop flying chips, particles and sparks from hitting an operator. They are not intended as machine guards.

**Signs:** Signs with messages such as “danger,” “warning” or “caution” can be used as part of an overall guarding plan. While these signs should be used to point out the hazardous areas of a machine, they are not to be used as the only means of operator protection. “Danger” signs are used for the most severe hazards, particularly those that will cause death or serious injury if precautions are not taken. “Warning” signs are used for hazards that are less severe, but can still cause severe injury or death. “Caution” signs are for hazards that can cause minor or moderate injury.

## Mechanical Power Presses

A mechanical power press shears, punches, forms, or assembles metal or other materials by means of tools or dies attached to slides or rams. Because of the level of force mechanical power presses can generate, they can be quite hazardous and have additional safety requirements beyond that of a hydraulic press. There are two primary types of mechanical power presses:

1. **Full-revolution clutch press:** A primary characteristic of full-revolution clutch presses is that, once activated, the press will complete its stroke before stopping. For this reason, safety devices, such as presence-sensing devices or two-hand controls, will be ineffective. However, two-hand trips may be appropriate for the hazard.
2. **Partial-revolution clutch press:** Partial-revolution clutch presses can disengage power at any point in the stroke. For this reason, there are guarding options that are not typically available for full-revolution clutch presses. Presence-sensing devices and two-hand controls can often be used on partial-revolution clutch presses, so long as some fixed guarding is implemented. In order for these devices to be effective, proper setup is critical.

## Inspections and Maintenance

Periodic and frequent inspections of mechanical power presses are a must. These inspections must include parts, auxiliary equipment and safeguards, ensuring that the clutch/brake mechanism, anti-repeat feature and single-stroke mechanism are in a safe operating condition and adjustment. In addition, each press should be tested at least once a week to determine the condition of the clutch/brake mechanism, anti-repeat feature and single-stroke mechanism.

A certification record of each inspection and maintenance/repair task performed must be maintained. These records should include:

- The date of the inspection, maintenance or repair work;
- The signature of the person who performed the inspection, maintenance or repair work; and
- The serial number (or similar identifier) of the power press inspected, maintained and repaired

All employees responsible for maintaining and inspecting presses will be trained to ensure they can competently care for, inspect and maintain power presses. Press operators will be trained on how to operate the presses before their initial assignment and at least annually thereafter. Training will cover the following:

- Presence-sensing device testing (e.g., how to use the test rod)
- Safety distances
- Presence-sensing device initiation (PSDI) mode operation, function and performance

- Requirements for hand tools during PSDI
- The consequences of bypassing safety guards

Training certification records will be kept and will include the name of the employee who was trained, the name of the trainer, a signature of employee and the date. Training records will be kept for the duration of employment.

**Point-of-operation injuries:** All point-of-operation injuries must be reported to OSHA within 30 days. However, injuries that result in amputation, hospitalization, the loss of an eye or death must be reported within 24 hours. Employers may submit this information in one of the following ways:

- Mailing the Directorate of Standards and Guidance (formerly known as the Director of Safety Standards) at the following address:  
  
U.S. Department of Labor  
Occupational Safety & Health Administration  
Directorate of Standards & Guidance  
200 Constitution Ave., NW  
Washington, DC 20210
- Mailing the state agency administering a plan approved by the Assistant Secretary of Labor for Occupational Safety and Health
- Completing the following [form](#)

## **Machine Safeguarding Assessments**

All machines must be evaluated to determine if they are appropriately guarded and whether or not the operator's safety is ensured. New equipment must be evaluated before it's put into service. Relying on the manufacturer and assuming the guarding is appropriate is not enough.

To evaluate machine guarding and potential hazards, use the assessment found in Appendix A. Employees who may be involved in the completion of this assessment include supervisors, engineers, maintenance personnel and safety representatives.

## **Training (Other Than Mechanical Power Presses)**

Training is a critical element to machine guarding safety, particularly given that both operators and nearby employees can be exposed to potential hazards. In general, training will include:

- A description/identification of hazards
- Information on how machine guards function
- Information on how safety devices function and how to test them
- Details regarding how and when to use lockout/tagout if the machine is not guarded during repair
- How to report a damaged or missing guard

Training is required upon assignment and if any of the following occur:

- An employee changes jobs within the company
- New machinery is acquired
- An accident or near miss related to a machine guarding issue occurs
- An employee is improperly using a guard or shows other deficiencies related to using machines

## **Plan Review**

The program administrator will review and revise this plan annually or as needed.



# CHECKLIST | APPENDIX A: MACHINE SAFEGUARDING ASSESSMENT

Inspector(s):

Date:

REQUIREMENTS FOR ALL SAFEGUARDS	YES	NO	COMMENTS
Do the safeguards provided meet the minimum OSHA requirements?	<input type="checkbox"/>	<input type="checkbox"/>	
Do the safeguards prevent workers' hands, arms and other body parts from making contact with dangerous moving parts?	<input type="checkbox"/>	<input type="checkbox"/>	
Are the safeguards firmly secured and not easily removable?	<input type="checkbox"/>	<input type="checkbox"/>	
Do the safeguards ensure that no object will fall into the moving parts?	<input type="checkbox"/>	<input type="checkbox"/>	
Do the safeguards permit safe, comfortable and relatively easy operation of the machine?	<input type="checkbox"/>	<input type="checkbox"/>	
Can the machine be oiled without removing the safeguard?	<input type="checkbox"/>	<input type="checkbox"/>	
Is there a system for shutting down the machinery before safeguards are removed?	<input type="checkbox"/>	<input type="checkbox"/>	
Can the existing safeguards be improved?	<input type="checkbox"/>	<input type="checkbox"/>	

MECHANICAL HAZARDS	YES	NO	COMMENTS
<b>The point of operation</b>			
Is there a point-of-operation safeguard provided for the machine?	<input type="checkbox"/>	<input type="checkbox"/>	
Does it keep the operator's hands, fingers and body out of the danger area?	<input type="checkbox"/>	<input type="checkbox"/>	
Is there evidence that the safeguards have been tampered with or removed?	<input type="checkbox"/>	<input type="checkbox"/>	
Could you suggest a more practical, effective safeguard?	<input type="checkbox"/>	<input type="checkbox"/>	
Could changes be made on the machine to eliminate the point-of-operation hazard entirely?	<input type="checkbox"/>	<input type="checkbox"/>	
Is there a point-of-operation safeguard provided for the machine?	<input type="checkbox"/>	<input type="checkbox"/>	

Power transmission apparatus			
Are there any unguarded gears, sprockets, pulleys or flywheels on the apparatus?	<input type="checkbox"/>	<input type="checkbox"/>	
Are there any exposed belts or chain drives?	<input type="checkbox"/>	<input type="checkbox"/>	
Are there any exposed set screws, key ways, collars or similar components?	<input type="checkbox"/>	<input type="checkbox"/>	
Are starting and stopping controls within easy reach of the operator?	<input type="checkbox"/>	<input type="checkbox"/>	
If there is more than one operator, are separate controls provided?	<input type="checkbox"/>	<input type="checkbox"/>	
Other moving parts			
Are safeguards provided for all hazardous moving parts of the machine including auxiliary parts?	<input type="checkbox"/>	<input type="checkbox"/>	

NONMECHANICAL HAZARDS	YES	NO	COMMENTS
Have appropriate measures been taken to safeguard workers against noise hazards?	<input type="checkbox"/>	<input type="checkbox"/>	
Have special guards, enclosures or personal protective equipment been provided, where necessary, to protect workers from exposure to harmful substances used in machine operations?	<input type="checkbox"/>	<input type="checkbox"/>	

ELECTRICAL HAZARDS	YES	NO	COMMENTS
Is the machine installed in accordance with National Fire Protection Association and National Electrical Code requirements?	<input type="checkbox"/>	<input type="checkbox"/>	
Are there loose conduit fittings?	<input type="checkbox"/>	<input type="checkbox"/>	
Is the machine properly grounded?	<input type="checkbox"/>	<input type="checkbox"/>	
Is the power supply correctly fused and protected?	<input type="checkbox"/>	<input type="checkbox"/>	
Do workers occasionally receive minor shocks while operating any of the machines?	<input type="checkbox"/>	<input type="checkbox"/>	

TRAINING	YES	NO	COMMENTS
Do operators and maintenance workers have the necessary training on how to use the safeguards and why?	<input type="checkbox"/>	<input type="checkbox"/>	
Have operators and maintenance workers been trained on where the safeguards are located, how they provide protection and what hazards they protect against?	<input type="checkbox"/>	<input type="checkbox"/>	

Have operators and maintenance workers been trained on how and under what circumstances guards can be removed?	<input type="checkbox"/>	<input type="checkbox"/>	
Have workers been trained on the procedures to follow if they notice guards that are damaged, missing or inadequate?	<input type="checkbox"/>	<input type="checkbox"/>	

PROTECTIVE EQUIPMENT AND PROPER CLEANING	YES	NO	COMMENTS
Is protective equipment required?	<input type="checkbox"/>	<input type="checkbox"/>	
If protective equipment is required, is it appropriate for the job, in good condition, kept clean and sanitary, and stored carefully when not in use?	<input type="checkbox"/>	<input type="checkbox"/>	
Is the operator dressed safely for the job (i.e., no loose-fitting clothing or jewelry)?	<input type="checkbox"/>	<input type="checkbox"/>	

MACHINERY MAINTENANCE AND REPAIR	YES	NO	COMMENTS
Have maintenance workers received up-to-date instruction on the machines they service?	<input type="checkbox"/>	<input type="checkbox"/>	
Do maintenance workers lock out the machine from its power sources before beginning repairs?	<input type="checkbox"/>	<input type="checkbox"/>	
Where several maintenance persons work on the same machine, are multiple lockout devices used?	<input type="checkbox"/>	<input type="checkbox"/>	
Do maintenance persons use appropriate and safe equipment in their repair work?	<input type="checkbox"/>	<input type="checkbox"/>	
Is the maintenance equipment itself properly guarded?	<input type="checkbox"/>	<input type="checkbox"/>	
Are maintenance and servicing workers trained on the requirements of 29 CFR 1910.147, lockout/tagout hazard, and do the procedures for lockout/tagout exist before they attempt their tasks?	<input type="checkbox"/>	<input type="checkbox"/>	