

Safeguarding

Safeguarding - General

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What is safeguarding?

Safeguarding is the general term used to describe a number of control measures that are used to protect workers from contact with moving parts or other similar unsafe conditions. The devices may:

- Stop a machine if a hand or body part enters a danger area
- Restrain or withdraw (pull back) the hand from the danger area
- Require the operator to keep both hands on a control
- Be a barrier that synchronizes with the machine's cycle, preventing entry to the danger area during the hazardous part of the cycle

Safeguards include guards, safety devices, shields, barriers, warning signs, safe work procedures, and personal protective equipment (PPE).

Please also see the OSH Answers on [Safeguarding – Working around Machinery](#).

What are the different types of guards?

A guard is a specific type of safeguard. A guard is a part of machinery specifically used to provide protection by means of a physical barrier. Other names may be casing, door, or enclosing guard. There are also protective devices that may be used. Different types of guards include:

- **Adjustable guard** - a fixed guard that is adjustable as a whole or that incorporates adjustable parts. The adjustment to the guard remains fixed during operation.

- **Distance guard** - a fixed guard that does not completely enclose the hazard but that prevents or reduces access because of its physical dimensions and its distance from the hazard.
- **Fixed guard** - a guard kept in place (such as a closed or attached to a fixed surface) either permanently (e.g., by welding) or by means of fasteners (e.g., screws, nuts, etc.), requiring tools for the removal or opening. It is not dependent on moving parts to function. The guard may be made of sheets of metal, screen, wire, bars, plastic or other material that is strong enough to endure any impact it might receive. The fixed guard may enclose the hazard or leave a specific distance to reduce access to the hazard.
- **Interlocked guard** - a guard attached and monitored by the control system in such a manner that it prevents or stops the operation of hazardous machine under specified conditions. Interlock guards may be electrical, mechanical, hydraulic, or pneumatic.
- **Self-adjusting or self-closing guard** - movable guard operated by a machine element (for example, a moving table) or by the workpiece or a part of the machining jig so that it allows the workpiece (and the jig) to pass and then automatically returns (by means of gravity, a spring, other external power, etc.) to the closed position as soon as the workpiece has vacated the opening through which it has been allowed to pass.

What are examples of safeguard devices?

Examples of safeguard barriers include:

- Photoelectric (optical) sensing devices, such as light field devices.
- Radiofrequency presence-sensing devices that use a radio beam that is part of the machine control circuit. The machine will have a friction clutch or other reliable way to stop the machine.
- Electromechanical sensing devices have a probe or contact bar that drops when the machine begins to cycle. If there is a reason that prevents the device from dropping, the machine will not cycle.
- Pullback devices are often cables attached to an operator's hands, wrists or arms. The device will allow access to the machine when it is safe to do so. When it is not safe, the device will pull the operator away from the danger area.
- Restraint or hold-back devices that use cables or straps attached to the operator's hands at a fixed spot.
- Safety trip controls, such as a pressure-sensitive body bar, that allow for the machine to be deactivated if the operator trips, loses balance, or moves beyond the safe area.
- Two-hand controls that require the operator to provide constant pressure. When the pressure is removed, the machine will stop.

- Two-hand trip controls that require the operator to activate the machine cycle but after which their hands can be free.
 - Gates that are movable barriers. Gates are often interlocked with the machine such that the machine will not cycle until the gate is in place.
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How is the appropriate safeguard selected?

The selection of safeguards should always meet principles of safe design and the [hierarchy of control](#). Some examples include safeguarding by design, using various types of guarding and other devices (e.g., interlocks, limited movement, etc), and procedures.

Some examples based on the hierarchy of control include:

Control Method	Examples include:
Elimination - remove the hazard from the workplace	<ul style="list-style-type: none"> • Process design, redesign or modification including changing the layout to eliminate hazards • Eliminate or reduce human interaction in the process • Automate tasks, material handling (e.g., lift tables, conveyors, balancers), or ventilation
Substitution - replace hazardous materials or machines with less hazardous ones	<ul style="list-style-type: none"> • Machines that have energy containment • Machines with lower energy (e.g., lower speed, force, pressure, temperature, amperage, noise, or volume)
Engineering Controls	<ul style="list-style-type: none"> • Installation of guards and safeguards such as emergency stop devices, presence-sensing devices, two-hand controls, platforms, or guardrails for fall protection
Systems that increase awareness of potential hazards	<ul style="list-style-type: none"> • Lights, beacons, strobes • Backup alarms, notification systems • Audio warnings (such as horns, sirens, or back-up beepers) • Hazard warning signs, placards, labels
Administrative Controls - controls that alter the way the work is done	<ul style="list-style-type: none"> • Training • Housekeeping processes • Safe job processes, rotation of workers, changing work schedules • Safe work procedures, such as lockout/tag out
Personal Protective Equipment - equipment worn by individuals to reduce exposure	<ul style="list-style-type: none"> • Protective eyewear and faceshields • Hard hats • Hearing protection • Hand protection • Protective footwear

Control Method	Examples include:

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