

Safeguarding

Safeguarding - General

On this page

[What is safeguarding?](#)

[What is a safeguard?](#)

[What are the different types of guards?](#)

[How is the appropriate safeguard selected?](#)

What is safeguarding?

The CSA standard Z432 Safeguarding of machinery defines safeguarding as:

“... protective measures consisting of the use of specific technical means, called safeguards (guards, protective-devices), to protect workers from hazards that cannot be reasonably removed or sufficiently limited by design.”

Note: This OSH Answers fact sheet is based on CSA standard Z432-16 Safeguarding of machinery. Please refer to this standard in its entirety and to any regulatory requirements that may apply for your jurisdiction.

Note: This OSH Answers fact sheet is part of a series. Please also see [Safeguarding – Working around Machinery](#).

What is a safeguard?

The CSA standard Z432 Safeguarding of machinery defines a safeguard as:

“... a guard or protective device designed to protect workers from harm.”

What are the different types of guards?

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. The CSA standard Z432 defines six different types of guards:

- **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.
- **Fixed 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 (i.e., 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.
- **Interlocked guard** - a guard attached and monitored by the control system in such a manner that it prevents the operation of hazardous machine functions under specified conditions.
- **Movable guard** - a guard connected by mechanical means (e.g., hinges or slides) to the machine frame or an adjacent fixed element. It can be opened without the use of tools.

The opening and closing of this type of guard can be power operated.

- **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.

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 safeguards (see types above) • Installation of complementary measures such as emergency stop devices, 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 • 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
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

Adapted from: CSA Z432-16 Safeguarding of machinery

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