Employee Safety

A Guide to Interlocked Machine Guards

Matt Morgan | Aug 29, 2025

One misplaced hand or loose sleeve near moving machine parts can turn a routine task into a life-altering injury. That's why machine guarding is a required defense to protect workers in any manufacturing or metalworking operation.

Employers can choose from many ***possible solutions for machine guarding***. One type, interlocked machine guards, may be the right fit for certain applications. Here's what you need to know about this common type of machine guard.

A Brief Overview of Machine Guarding

Machine guarding refers to the barriers and protection systems put in place to prevent injury to an employee who is operating a machine.

"Machine guards are your first line of defense against injuries caused by machine operation," the Occupational Safety and Health Administration (OSHA) explains in a ***brochure*** detailing machine guard requirements. "Each machine must have adequate safeguards to protect operators and other employees in the immediate work area from hazards created by ingoing nip points, rotating parts, sparks and flying debris."

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> Matt Clutter
> Rockford Systems

Hazards include areas where the machine cuts, bores, bends or shapes a workpiece, or where body parts or clothing could ***get caught in a moving part***.

According to OSHA, machine guards must:

- Provide a physical barrier that prevents the operator from encountering moving parts
- Be secured in place and unable to be bypassed
- Not be a hazard themselves

- Not impede an operator from doing a job quickly and comfortably

The ***four general types of machine guards*** are fixed, interlocked, adjustable and self-adjusting. (Read about their advantages and disadvantages ***here***.)

WATCH: MSC's Larry Costigan provides expertise on the importance of machine guarding and how MSC can customize solutions to meet your safety needs.

How Interlocked Machine Guards Work

Interlocked guards differ from other types of guards in that they are integrated into the machine's power supply.

While the guard is open—whether it's a gate, door, panel or shield—the connected machine's power automatically shuts off, and moving parts stop. Power can only be restored when the guard is put back in place and the operator restarts the machine.

Interlocked machine guards are recommended "anywhere that someone needs to be physically separated from a hazardous exposure, or to assure that the machine safeguarding device is in place where it's supposed to be to protect the operator while the machine is running," says Matt Clutter, director of educational services and customer fulfillment for ***Rockford Systems***.

Besides protecting from moving parts, interlocked machine guards may also be used to shield operators or nearby workers from chips, sparks and coolant that may be thrown from the machine.

Read more: OSHA Machine Guarding Checklist: Retrofit and Customize Your Guards

Benefits of Interlocked Machine Guards

Interlocked guards are useful on machines that require frequent service work or material changeovers, or in applications where an operator needs to safely access a machine while performing a job.

"When used properly, interlocked machine guards act as a protective stop in situations where an operator may be exposed to a hazard, especially in cases where someone may need to stick their hand into a dangerous point of operation on a machine to either feed and remove parts or unjam stuck parts," Clutter says.

However, an interlocked guard may not be the best safety solution for applications requiring access to the point of operation, such as manual feeding.

The Main Types of Interlocked Machine Guards

The crux of an interlocked machine guard is the sensor or switch, which attaches to the guard and links to the machine's power. There are several types of switches.

"No matter which type of interlock switch somebody uses, the key is making sure that they're proper for the application and properly integrated into the machine in a functionally safe manner," Clutter says.

Basic Interlocks

Basic interlocks operate with an actuator key that enters the switch and tells the machine it's OK to start. These interlocks are versatile and can be mounted many ways, provided the device guards the machine properly.

"These switches are commonly used on hinged, sliding, lift-off style guards or panels, and some unique interlocked chip shields," Clutter says. "Closure of the guard or latch causes the actuator to enter the switch and release the anti-tampering mechanism, which makes the switch contacts."

Locking Interlocks

Locking interlocks use a mechanical locking bolt controlled by a solenoid that keeps the guard locked until conditions are safe.

"Locking switches are designed to prevent accidental or deliberate access while the machine is in motion," Clutter explains. "The mechanical locking feature is ideal for machines that have to either finish a sequence or a program, or coast to a stop before the interlocked guard can be opened."

Magnetic Interlocks

These types of switches use a magnet actuator and a magnetic sensor to detect guard position.

"Magnetic safety interlock switches are commonly used on guard or panel doors, as well as some unique interlocked chip shields," Clutter says. "These types of safety switches are designed to be submersible, to a degree, so they're ideal in areas where washdown may be a factor."

RFID Interlocks

RFID interlocks operate similarly to magnetic interlocks but use radio-frequency identification for the switch and actuator. Because they can be programmed to the individual machine guard, user or role, they provide an added level of security. Plus, employers and safety managers can monitor the status of the guard to ensure compliance.

Maintenance and Troubleshooting

As part of good preventive maintenance, interlocked machine guards should be inspected once in a while.

"Periodic inspection can shine a light on if the switch was properly applied, if it's the proper switch for the application, if it was properly installed, and if it's integrated properly into the control system," Clutter says.

There is a right way and a wrong way to install interlocked guards onto machines, he says.

"If they're not integrated into the machine control correctly, the switch might not work the way that it's intended to," he adds. "Misapplication and misintegration of these devices is something that we see a lot—people not understanding how to tie it in, or what kind of circuit should be present."

Also, Clutter recommends that operators function-test the guards at the beginning of every shift, and at

changeovers, too, if they occur during a shift. That way, every operator knows the guard is working safely and there isn't a false sense of security.

"It's not uncommon for us to see that somebody has bypassed or disconnected a safety device," he says, "and the person who uses that machine next may not know that."

Read more: Machine Guard Infographic: The Point of Operation

