Machine Guarding Toolbox Talk

WHAT’S AT STAKE?

Manufacturers design their machines to protect operators from coming into contact with hazardous parts. Despite this, machines cause more than 18,000 injuries—including amputations, lacerations, and crushing injuries—in the United States each year. Many of these injuries were caused by unsafe operation or improper maintenance. **Machine guards**, or barriers between the operator and dangerous parts, are one of the most common strategies that manufacturers use to make their tools safer.

WHAT’S THE DANGER?

Crushed hands and arms, severed fingers, blindness – the list of possible machinery-related injuries is as long as it is horrifying. There seem to be as many hazards created by moving machine parts as there are types of machines. Safeguards are essential for protecting workers from needless and preventable injuries.

A good rule to remember is: Any machine part, function, or process which may cause injury must be safeguarded. When the operation of a machine or accidental contact with it can injure the operator or others in the vicinity, the hazards must be either controlled or eliminated.

HAZARDOUS MECHANICAL MOTIONS AND ACTIONS

A wide variety of mechanical motions and actions may present hazards to the worker. These can include the movement of **rotating members, reciprocating arms, moving belts, meshing gears, cutting teeth, and any parts that impact or shear**. These different types of hazardous mechanical motions and actions are basic in varying combinations to nearly all machines, and recognizing them is the first step toward protecting workers from the danger they present.

The basic types of hazardous mechanical motions and actions are:

Motions

- rotating (including in-running nip points)
- reciprocating
- transversing

Actions

- cutting
- punching
- shearing
- bending

Motions

Rotating motion can be dangerous; even smooth, slowly rotating shafts can grip clothing, and through mere skin contact force an arm or hand into a dangerous position. Injuries due to contact with rotating parts can be severe.

Collars, couplings, cams, clutches, flywheels, shaft ends, spindles, meshing gears, and horizontal or vertical shafting are some examples of common rotating mechanisms which may be hazardous. The danger increases when projections such as set screws, bolts, nicks, abrasions, and projecting keys or set screws are exposed on rotating parts.

NON – MECHANICAL HAZARDS

Non-mechanical hazards that can injure machine operators or personnel working in the vicinity of machinery. These hazards include flying splinters, chips or debris; splashes, sparks or sprays that are created when the machine is operating. These hazards can be prevented through the use of machine guarding and wearing/use of required personal protective equipment (PPE).

HOW TO PROTECT YOURSELF

MACHINE GUARDS

There are several different types of **machine guards**. Guards are materials that keep workers from having direct contact with moving parts and other dangerous areas of a machine. Some guards also protect workers from shavings, flying shards or metal sparks created by working machines. The Occupational Safety and Health Administration (OSHA) requires any machine part that could cause injury to be guarded. Guard design and material will vary from machine to machine and from tool to tool.

Fixed Guards

Fixed guards are permanently attached to the machine or tool, don’t have any moving parts, and can’t be moved while the machine is in use. They’re most often used to enclose the point of operation, or other hazards that the operator doesn’t need to interact with, like fan blades or flywheels. Because fixed guards are permanent features of the machine, they must be disassembled and removed to perform any kind of adjustment or maintenance.

Adjustable Guards

Adjustable guards, like fixed guards, are permanent, but they can be adjusted to allow the machine to handle different sizes of material. They must be manually adjusted and locked into place, so all employees who will operate adjustable guards must be trained on their use. If improperly adjusted or locked, adjustable guards can fail to prevent contact with moving parts, causing serious or even fatal injury.

Self-Adjusting Guards

Self-adjusting guards serve the same purpose as adjustable guards, but automatically adapt to the size of the material. When the machine is at rest, these guards sit all the way down. When the machine is in use, the operator feeds material into the machine, which opens the guard just enough to let the material in. These guards are commonly found on table saws and woodworking tools.

Interlocking Guards

Interlocking guards, also known as barrier guards, automatically

shut off or disengage the power source when the guard is open or removed. These are particularly useful in situations where operators need to be able to open the guard or access the guarded parts of the machine, such as when clearing jams. These guards allow safe access to interior parts of the machine without requiring a total disassembly. However, they can be easy to open on accident and require careful adjustment and maintenance.

Requirements for Guards

- **Prevent contact**

The guard must prevent hands, arms, and any other part of a operator's body from making contact with dangerous moving parts.

- **Secure**
  Operators should not be able to easily remove or tamper with the guard. Guards and safety devices should be made of durable material that will withstand the conditions of normal use. They must be firmly secured to the machine.
- **Protect from falling objects**

The guard should ensure that no objects can fall into moving parts.

- **Create no new hazards**

A guard cannot create a hazard such as a shear point, a jagged edge, or an unfinished surface that could cause a laceration.

- **Create no interference**

Any guard that prevents the operator from performing the job quickly and comfortably might soon be overridden or disregarded.

- **Allow safe lubrication**

If possible, operators should be able to lubricate the machine without removing the guards.

Training Requirements:

Instruction in the safe use and care of machines and supervised

on-the-job training are essential in preventing injuries. Only trained employees/students should operate machinery.

Training should include:

- Review of safety measures such as: knowing the hazards in the work area, including machine-specific hazards; machine operating procedures; lockout / tagout procedures; and safe work practices such as the buddy system.
- The purpose and proper use of machine safeguards.
- All procedures for responding to safeguarding problems such as immediately reporting unsafe conditions such as missing or damaged guards and violations of safe operating practices to supervisors.

FINAL WORD

Crushed hands and arms, severed fingers, blinders are just a few of terrifying machinery related injuries. The safety rule to remember: any part of the machine, function, or process which may cause injury must be safeguarded.