By the Numbers: Machine Guarding



DID YOU KNOW?

Employee exposure to unguarded or inadequately guarded machines is prevalent in many workplaces. Consequently, workers who operate and maintain machinery suffer approximately 18,000 amputations, lacerations, crushing injuries, abrasions, and over 800 deaths per year.

Occupational Safety & Health Administration (OSHA) nominated OSHA's top ten cited violations in 2017. Machine guarding was NO.8 on this not so famous list with 1.933 violations. In 2018, machine guarding was NO.9.

A lack of machine safeguarding also held the dubious distinction of making the list of OSHA's ten largest monetary penalties for the year – not once but four times. In fact, the largest proposed monetary penalty, a staggering $2.6 million (USD), arose from an incident where a worker was crushed to death while clearing a sensor fault in a robotic conveyor belt.

According to the most recent Bureau of Labor Statistics data, manufacturing plants reported approximately 2,000 accidents that led to workers suffering crushed fingers or hands, or had a limb amputated in machine-related accidents. The rate of amputations in manufacturing was more than twice as much (1.7 per 10,000 full-time employees) as that of all private industry (0.7).

KEEP IN MIND

Ways in which workers suffer machine-related injuries.

- Being hit by the part of the machine that presses, punches, cuts, shapes, etc.
- Getting trapped between moving parts.
- Limbs, hair, clothes or jewelry entangled in a chain, belt, shaft, gear, blade, etc.
- Being burned or electrocuted after accidental startup.
- Being hit by material thrown from the machine.

How do we prevent this?

Assess the Risk

- Do the hazard assessment:
- When the machine is first installed.
- At least monthly or more often if the manufacturer recommends it.
- After injuries, near misses and other incidents.
- After the machine malfunctions or is moved.
- Cover the four areas where machine injuries are most likely to occur:
- The point of operation, or machine part where the cutting, shaping, boring, forming or other operation is done on the material.
- Moving parts, including flywheels, pulleys, belts, couplings, chains, gears, conveyors, feed mechanisms, etc.
- In-running nip points, or spaces between rotating and/or slowly-moving parts.
- Primary power source, including engines, turbines and other equipment used to power the machine.

Select Guards

The challenge is to decide which guards to use to control risks you identify in your hazard assessment.

There are four basic types of machine guarding methods you can use alone or in combination, including:

- Interlocked guards – automatically stop the machine when a tripping mechanism is activated until the guard is back in place.
- Self-adjusting guards – here the size of the opening in the barrier adjusts to accommodate the stock/material.
- Automatic stopping devices – such as presence sensing devices and pullback devices.
- Automatic or robotic feeding and ejection so that materials don’t have to be manually fed into and taken out of the machine.
- Location/Distance guarding – placing machines away from work areas and/or in locations that are impossible or difficult for workers to get to.

Inspect Guards

Once machine guards are in place, they must be properly and regularly inspected. Inspection details and schedules will depend on the specific machines and guards used. But there are also general things to check, including verifying that **guards** are:

- Effective in keeping the worker’s body, hair and clothing from contacting moving parts.
- Firmly secured so that workers can’t easily remove them.
- Free of jagged edges, shear points, unfinished surfaces and other hazards.
- Allowing workers to do their job quickly and comfortably—if they don’t, workers may try to remove them.

Finally, make sure your inspection covers:

- Guards used at the point of operation.
- Guards at the power source.
- Each continuous line of shafting.
- Pulleys, ropes, belts, chains and chain drivers, sprockets and gears.

Provide Training

Ensure workers understand:

- The hazards posed by the machines at your workplace.
- How machine injuries can happen.
- The guards in place to control the hazards.
- The reason to never, ever remove or tamper with machine guards.
- The kind of clothing to wear—and not wear—to avoid machine injury.
- The PPE to use when working near machines.
- Any other steps they must take to protect themselves.

Workers who operate machinery also need technical safety training for each machine they use. This training must be delivered by somebody who is qualified to operate and understands the hazards associated with the machine. So, while being a supervisor qualifies you to provide general safety training, it may not be adequate for providing technical training.