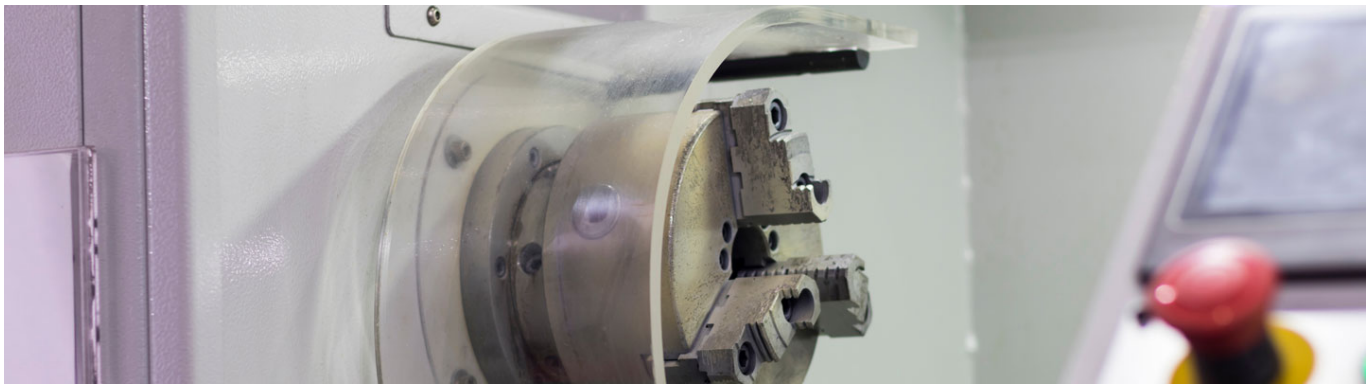

Safety

Machine Safety: Here's Why You Should Be Taking It Seriously

Kip Hanson | May 21, 2021

For those working on today's faster, more demanding—and increasingly automated—production floors, machine safety is more important than ever. Here's why you should take it seriously.

Every machinist and sheet metal worker knows that the industry's safety people have gone too far.

The interlock on the CNC lathe stops you from opening the door to see what caused that funny noise just now.

And the spark deflectors on the bench grinder are set so close to the tool rest, making it nearly impossible to sharpen a drill.

Then there's the laser guarding on the press brake that slows you down, making it tough to make production quota.

There's no argument: Machine guarding is a real pain in the neck. Or at least it seems that way until you compare these small inconveniences to the heartache of losing your sight, or not being able to play catch with your child.

> **"Don't wait for OSHA to come knocking before donning your safety glasses. And hassle or not, door interlocks and machine guarding are your friends, as are the dedicated people who work for OSHA. Remember, safety first."**

Minor production inconveniences aside, it's critical that all of us remember the decades-old motto "safety first," especially given the past year's pandemic-driven social distancing and cleanliness requirements.

For guidelines on achieving this, look no further than the Occupational Safety and Health Administration, or OSHA, which offers advice on everything from fall prevention campaigns to preventing heat-related illnesses, as well as something we've all become acquainted with of late: PPE, or personal protective equipment.

Equipment and Machine Guarding Safety Requirements

Machine safeguarding is another important safety concern. For help with that, turn to ***Standard Number 1910.212***. There you'll find the following relevant safety standards:

- 1910.212(a)(1) Types of guarding. One or more methods of machine guarding shall be provided to protect the operator and other employees in the machine area from hazards such as those created by point of operation, ingoing nip points, rotating parts, flying chips and sparks. Examples of guarding methods are barrier guards, two-hand tripping devices, electronic safety devices, etc.
- 1910.212(a)(2) General requirements for machine guards. Guards shall be affixed to the machine where possible and secured elsewhere if for any reason attachment to the machine is not possible. The guard shall be such that it does not offer an accident hazard in itself.
- 1910.212(a)(3)(ii) The point of operation of machines whose operation exposes an employee to injury, shall be guarded. The guarding device shall be in conformity with any appropriate standards therefore, or, in the absence of applicable specific standards, shall be so designed and constructed as to prevent the operator from having any part of his body in the danger zone during the operating cycle.

There's more, including a list of machinery that includes alligator shears, guillotine cutters and calender rolls, much of which has been replaced by more modern CNC equipment. Contained within each of these standards are hyperlinks to various "standard interpretations" that offer additional information.

For more detailed and timely interpretations of OSHA machine guarding safety criteria, one can turn to the ISO (the International Organization for Standardization) or ANSI (American National Standards Institute), each of which publishes all manner of safety standards.

For example, there's ***ISO 13854:2017(en) Safety of machinery — Minimum gaps to avoid crushing of parts of the human body*** and ***ANSI B11.22-2002 (R2012) Safety Requirements for Turning Centers and Automatic, Numerically Controlled Turning Machines***.

Have a credit card handy, however, because only select portions of these standards are free of charge.

Read more: Get the cold hard facts on must-have machine guarding in this infographic

Taking Safety Into Your Own Hands

The point here is that, while both necessary and important, the OSHA safety standards can be confusing.

This is why the organization encourages companies to attend training sessions and to contact the ***Office of Partnerships and Recognition***, where manufacturers can learn about participation in the OSHA Strategic Partnership Program (OSPP), Voluntary Protection Programs (VPP), or the OSHA Challenge Program, all of which help to assure compliance and worker safety.

Accomplishing this becomes a lot easier by working with safety experts such as Tony Caruso, vice president of sales and marketing at industrial safety equipment manufacturer ISB. He'll tell you that one of the most flexible and cost-effective means of safeguarding nearly any work cell, automated material handling system or piece of capital equipment is with a safety light curtain.

Read more: Anti-Fog Eye Protection Technology: How MCR Safety's MAX6 Coating Keeps Workers Safe

According to the manufacturer, the Merlin 4000 Press Brake Guarding System is the most advanced such light curtain system available. (Image courtesy of ISB)

“Depending on the photocell density, you can prevent hands and even fingers from entering a specific area, or by spreading the photocells farther apart, you might allow an operator to reach in all the way to his or her torso,” Caruso says. “You can also turn off certain photocells to create zones that allow the workpiece to enter the machine, but not the operator’s hands.”

Such systems might cost a bit more than a fence or other physical barrier, but they are also far easier to reconfigure. They do require that the beam generator—or emitter—be mounted to a stanchion or pole, though, and mirrors might be mounted nearby to redirect the light curtain around corners to create a designated work area. But aside from wiring the emitter and receiver’s 24-volt DC power supply and OSSD outputs into the machine tool shut-off circuits, this comprises the extent of any “hard” infrastructure.

Installation of a safety light curtain is a relatively simple task, requiring little more than some wiring into the machine's safety circuits. (Image courtesy of ISB)

Best of all, they're easy to install, so much so that Caruso and his team are seldom needed except on complex configurations.

"Most of my time these days is spent on press brake guarding, which is much more involved," he says. "For example, we have developed the Merlin 4000 Press Brake Guarding System, which not only uses a light curtain to keep hands out of press brakes but also memorizes the part profiles so that it can determine whether the operator's hands and workpiece are in the proper location for safe operation. This new system utilizes full-color touch screen to prompt the operator every step of the way."

Whatever the application, Caruso added that light curtains are a great way to protect the operator whenever there's a pinch point present, and for creating a perimeter guard where you want to keep bodies out.

"They're well-accepted by the industry and are used extensively in all sorts of applications," he adds. "That said, there are also electronic safety mats available, which trigger when someone walks on them, but these are a bit old-school. A more modern approach is a programmable laser scanner. These are the most expensive option, but if you're looking for total flexibility in zone size and shape, it's a great way to go."

Read more: Head, Face and Eye Protection for Your Workers: What to Use and When

Electronic safety mats, though considered a bit "old-school," are another great way to safeguard certain areas. (Image courtesy of ISB)

Read more: The Latest Toolholding and Workholding Innovations That Help You Increase Productivity

Why OSHA Is Your Friend

Very few of those reading this are likely old enough to remember the days before OSHA, but the fact remains that official concern over worker safety in the United States is a relatively recent development.

In fact, the Occupational Safety and Health (OSH) Act of 1970 was the first major piece of legislation aimed at making workplaces of all kinds free of recognized hazards. These include the construction, agriculture, maritime and general industries, all of which—thanks to OSHA—are required by law to ensure that workers have safe, healthy environments.

It was a bold move. The Walsh-Healey Public Contracts Act (PCA), considered by many to have laid the groundwork for OSHA, was signed into law in 1936, and only applied to manufacturers supplying goods to the federal government. Prior to that, there was the creation of the U.S. Department of Labor and the National Safety Council in 1913, the Bureau of Mines in 1910, and the National Electrical Code in 1897. Considering that in the U.S. the Industrial Revolution began roughly one century earlier, it begs the question: What took so long?

And while some among us today might balk at what they consider to be overzealous government interference, consider the tragedies of that era as described in a 2007 ***Wall Street Journal*** article: In 1911,

a fire in the Triangle Shirtwaist factory killed 146 garment workers. Eight years later, 84 miners burned to death in a tunnel whose entrance bore the slogan “Safety First.” The rule of thumb for construction workers back then was “a life for every story” and one prominent journalist, Crystal Eastman, suggested that “extreme caution is as unprofessional among the men in dangerous trades as fear would be in a soldier.”

Now, imagine a world without all these regulatory agencies. The takeaway is clear. Don’t wait for OSHA to come knocking before donning your safety glasses. And hassle or not, door interlocks and machine guarding are your friends, as are the dedicated people who work for OSHA. Remember, safety first.

Read more: Avoiding Unplanned Downtime: 3 Ways Technology Can Help

What best practices can you share about ensuring workers use machinery safely? Share your thoughts and insights in the comments below.

