Four Types of Guards

- Fixed
- Interlocked
- Adjustable
- Self-Adjusting

CITATIONS

No guard on grinders.
Wrong speed or unknown speed on grinding wheel
Machine Guarding

رى **Major Points**

- Mortar mixer must have guarding over the open face. Many manufacturer sell retrofit guards.
- Mechanical hazards can be found at the point of operation, the power transmission apparatus or at the area of transverse motion.
Many fatalities have resulted from employees getting caught in rotating shafts such as well boring drills & lathes.
Machine Guarding

- Fixed Guards
  - A permanent part of the machine
  - Not dependent on any other part to perform the function
  - Usually made of sheet metal, screen, bars or other material which will withstand the anticipated impact
  - Generally considered the preferred type of guard.
  - Simple and durable
Machine Guarding

- Interlocked Guard
  - Usually connected to a mechanism that will cut off the power automatically
  - Could use electrical, mechanical or hydraulic systems
  - Should rely on a manual reset system
Machine Guarding

- **Adjustable Guard**
  - Very flexible to accommodate various types of stock.
  - Manually adjusted
Machine Guarding

Self-Adjusting

- The opening is determined by the movement of the stock through the guard.
- Does not always provide maximum protection.
- Common complaint- reduced visibility at the point of operation.... “I can’t see what I’m doing!”
Subpart O - Machinery & Machine Guarding (1910.211 - 222)

Machine guards - General
212(a)(1) 1,726

Grinders - Tongue guards
215(b)(9) 1,491

Pulleys
219(d)(1) 1,285

Point of operation
212(a)(3)(ii) 1,100

Grinders - Work rests
215(a)(4) 1,027

Number of Serious Violations - FY 94
Machine Guarding

This picture, taken through a window, shows an unguarded saw blade.
Once inside the building, we find more violations. An ungrounded plug, an electrical cord with an illegal splice.

Don’t let these violations sneak up on you!
Machine Guarding

This shows a pulley system which has correct guards to keep fingers and tools away from pinch points.
Machine Guarding

- This man lost his finger when a machine in a foundry cut it off.
- There was no guard in place, as required by law, to keep his finger out of a point of contact.
Machine Guarding

- This grinder has a fixed guard on the side to keep fingers away from the moving grind stone.
Machine Guarding

- This is an example of a self-adjusting guard that automatically moves to accommodate different size stock.
- Note the unguarded pulley underneath.
Machine Guarding

- This is an example of an adjustable guard.
- The operator must move the guard to accommodate different size stock on this band saw.
Transmission sources such as this should be guarded to keep hands and arms out of them.
This machine is using a gate system to keep hands out of the point of operation area.
Bench Grinders require a work rest with a maximum clearance of 1/8 inch to insure that the work does not get drawn into the grinding wheel.
Machine Guarding

- The top clearance on a bench grinder should not exceed 1/4 inch.
This wood working device has an adjustable guard that moves as the wood is fed into it.
When working closely with wood cutting machines, a push stick can keep your fingers on the end of your hands!!
Machine Guarding

- This saw has:
  - a blade guard
  - anti kickback device
- It should have a retracting device to automatically bring the saw back into position
This worker is protected from the moving blade by an adjustable guard.
Machine Guarding

- Moving wheels are guarded with cover plates.
- Adjustable guard on the blade at the point of operation.
Machine Guarding

- A shield of safety glass prevents sparks and particles from striking the worker.
- Rotating shafts are required to have guards on them.
This machine is using a wire guard to stop the machine when a worker gets too close.
Instead of having the worker pick the finished product out of the die with their fingers, this system uses an automatic device to push the product out of the die.
This machine ejects the finished product automatically.
In order to operate this press the operator must push both buttons at the top of the machine.

This insures that his hands are not in the point of operation area when the press activates.
Machine Guarding

- The operator must press both of the control buttons at the same time to operate this press.
Machine Guarding

- This operator has wrist cuffs attached to her arms to keep her from putting them in harms way.
- Some versions will automatically pull the operator’s hands back when the press cycles.
This cable will stop the machine when it is pulled.
Machine Guarding

- The tripod type bar on top of this machine can be grabbed by a worker to stop the machine.
Machine Guarding

This safety bar will stop the machine if the worker gets too close to the operation area.
Machine Guarding

- Robots can be deadly.
- Establish a system to keep humans from getting into the robots work area.
- Maintenance workers must use a lockout system.