



WESTERN  
KENTUCKY  
UNIVERSITY

**Environmental Health & Safety**

**MACHINE GUARDING  
PROGRAM  
2007**

## **Introduction**

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. Amputation is one of the most severe and crippling types of injuries in the occupational workplace, and often results in permanent disability. Crushed hands and arms, severed fingers and limbs, lacerations and abrasions - the list of possible machinery-related injuries is long and horrifying. Many hazards are created by moving machine parts. Safeguards are essential for protecting workers from preventable injuries.

## **Purpose**

The purpose of this machine guarding program is to establish guidelines of safeguarding of machinery for employees engaged in work activities involving machinery. All machines consist of three fundamental areas; the [point of operation](#), the [power transmission device](#), and the [operating controls](#). Despite all machines having the same basic components, their safeguarding needs widely differ due to varying physical characteristics and operator involvement. This machine guarding protection program includes all buildings on campus and off campus dealing with Western Kentucky University. Compliance of machine guarding program will be accomplished through effective education, engineering and administrative controls.

## **Guidelines**

Information for compliance with OSHA 1910.211-215 can be found at:  
<http://www.osha.gov/SLTC/machineguarding/index.html>

## **Procedure**

There are many ways to safeguard machinery. Consideration needs to be given of the type of operation, the method of handling, the layout of the work area, and the product being produced in order to determine the best method to safeguard the individual machine.

As a general rule, power transmission apparatus is best protected by fixed guards that enclose the danger area. An example would be a guard shielding the belt and pulley of a power transmission unit.

## **Types of Guards**

*Fixed*-The guard is a permanent part of the machine

*Interlocked*-When this guard is opened or removed, the tripping mechanism and /or power is automatically shut off. The machine can not start until the guard is replaced.

**Adjustable**-Guards that allows flexibility in being able to adjust according to the thickness of the stock.

**Self-adjusting**-This guard protects the operator by placing a barrier between the danger area and the operator. An example of self-adjusting guard would be a guard on a circular saw.

## **Power Transmission Device**

A safety device may perform one of several functions. It may stop the machine if a hand or any part of the body is inadvertently placed in the danger area; require the operator to use both hands on machine controls; or provide a barrier which is synchronized with the operating cycle of the machine in order to prevent entry to the danger area during the hazardous part of the cycle. These can be accomplished by photoelectric sensors, radiofrequency beams, or electromechanical sensing devices.

## **Point of operation**

Point of operation is the area on a machine where work is actually performed upon the material being processed. The point of operation of machines whose operation exposes an employee to injury shall be guarded. The guarding device shall conform with any appropriate standards. If no specific standard exists then the design and construction of the guard will prevent the operator from having any part of his body in the danger zone during the operating cycle.

The following are some examples of machines requiring point of operation guarding:

- Guillotine cutters
- Shears
- Alligator shears
- Power presses
- Milling machines
- Power saws
- Jointers
- Portable power tools
- Forming rolls and calendars

## **Simple Rules to Maximize Worker Safety**

1. Always be sure that moving mechanisms are clear of people and objects

2. Be sure that workers are not wearing any jewelry or loose clothing that could get snagged in the machine
3. Keep an eye on overheard moving parts, like pulleys, for potential hazards
4. Check that guards are in place at all points where you could contact moving parts before turning the machine on
5. Be aware of how to turn power on and off if you should have to do so quickly
6. Read the manufacturer's instructions on how to operate the machine safely and correctly
7. Feed material into the machine with push sticks, not your hands
8. Take it easy. Rushing through a job is one of the major causes of accidents
9. Make sure maintenance is performed when required. If you think your equipment might have missed its scheduled maintenance let your supervisor know.
10. Use lockout/tagout procedures when a machine needs repair or maintenance. Turn the machine and the power to the machine off and tag it so that no one tries to use it.

### **Self-inspection checklist for safeguards and other hazards**

This list of questions should help determine the safeguarding needs of a workplace by drawing attention to hazardous conditions or practices requiring attention according to OSHA Appendix G. These can be located at the following website:

### **Machine Guarding Information Reference**

[http://www.osha.gov/SLTC/etools/machineguarding/appendices/appendix\\_g.html](http://www.osha.gov/SLTC/etools/machineguarding/appendices/appendix_g.html)