

SUBJECT: Machine Operation and Guarding Requirements

REGULATORY STANDARD: 29 CFR 1910.212 - 244

DATE: January 2000

All mechanical motion is potentially hazardous. Motion hazards such as rotating devices, cutting or shearing blades, in-running nip points, reciprocating parts, linear moving belts and pulleys, meshing gears, and uncontrolled movement of failing parts are examples of motion and are peculiar to any one machine or job operation. Personnel working within areas where they are exposed to machinery or equipment hazards must be aware of the potential for accidents.

A. General

1. Personnel Training

Employees and students should be trained to safely operate each machine they will be required to use; to recognize potential accident-producing situations; and to know what to do when hazards are discovered. Only people who have been thoroughly trained, or those who are undergoing supervised on-the-job training on the equipment, should be permitted to operate machinery.

2. Personal Protective Equipment

- All personnel in areas where machines are operated must wear eye protection.
- Machine operators and their assistants should not wear loose fitting clothing, neckties, rings, bracelets, or other apparel that may become entangled in moving machinery.
- Caps should be worn to keep long hair away from moving machinery.
- Gloves cannot be worn when there is a chance of them being caught in machinery.
- Ear plugs or muffs should be used for hearing protection when operating noisy equipment or machinery.
- The Office of Environmental Health and Safety can be contacted to assist supervisors in determining personnel protective equipment needs.

3. Environmental Issues

- Machines designed for fixed locations should be securely fastened to the floor or other suitable foundation to eliminate all movement or "walking." Machines that have the potential for tipping or falling over must be firmly secured.

- Machines must never be left unattended with the power on unless the worker is operating more than one machine in a battery of machines.
- No attempt should be made to clean any part of a machine until the moving parts have come to a complete stop and the proper lockout/tagout procedure is in place, if required. Chips should not be removed from machinery by hand; hand brushes should be used. Compressed air may be used when reduced to less than 30 psi, and then only with effective chip guarding and personal protective equipment.
- Brushes, swabs, lubricating rolls, and automatic or manual pressure guns should be used by operators to lubricate material, punches, or dies so that operators are not required to reach into the point of operation or other hazardous area.
- Housekeeping
 - § Floors should be free of chips, dust, metal scraps, and other slipping and tripping hazards.
 - § Waste containers should be emptied often to prevent excessive waste accumulations.
 - § All materials, including usable scrap, should be stored so that they will not present a hazard.
 - § Drip pans should be used whenever equipment must be oiled. Machinery must not be operating when being lubricated unless lubrication is automatic or a long gravity flow spout is used, enabling the oiler to remain in the clear while performing this task.

4. Maintenance/Repair

- When maintenance or repair is needed, machines must be completely shut down and the control switch(es) locked and tagged in the "OFF" position. Complete lockout/tagout procedures must be followed.
- Cutting tools should be kept sharp and forming tools well dressed and free from accumulations of chips, dust, and other foreign matter. Where two or more cutting tools are used in one cutting head, they must be properly adjusted and balanced.
- Damaged cutting tools must be removed from service and not used until repaired.

5. Electrical Safeguards

- The motor "START" button must be protected against accidental or inadvertent operation. "START" buttons must never be wedged for continuous operation.
- Each machine must have a positive electrical disconnect or isolation switch which can be locked out.

6. Machine Controls

- Foot pedal mechanisms must be located and guarded so that they cannot be activated by falling objects or other accidental means. A pad with a non-slip contact area should be firmly attached to the pedal.
- Controls should be available to the workers at their operating positions so that they do not reach over moving parts of the equipment. Control functions should be identified by printed words and color-coding. Controls must never be wedged for continuous operation.
- Power controls must have a way of locking out electrical power. Disconnecting or isolating switches must be mounted on a visible side of, or near, the machine and must be used to lock out power to the machine during repairs or adjustments. When the power is locked out, the isolating switch must be tagged.

B. Guards

Many accidents are caused by machinery that is improperly guarded or not guarded at all. No mechanical motion that threatens a worker's safety should be left without a safeguard.

The following areas of machinery must be provided with barriers and/or enclosures that will effectively prevent personnel from coming in contact with moving components:

- Point of operation exposures such as blades, knives and cutting heads.
- Power transmission exposures such as belts, pulleys, shaft, gears, etc.
- Top, bottom and backside exposures, such as the underside of table saws and the wheels on band saws.

When a point-of-operation guard cannot be used because of unusual shapes or cuts, jigs or fixtures that will provide equal safety for the operator must be used. Upon completion of an unusual operation, the guard must be immediately replaced.

Whenever a guard is removed for other than an operational requirement, the machine must be shut down, and the control switch(es) locked and tagged in the "OFF" position.