

## MACHINE GUARDING

Machinery – especially unguarded machinery – is a frequent source of injury. Machine guarding can prevent injuries due to contact with moving parts, mechanical and electrical failures, and human error.

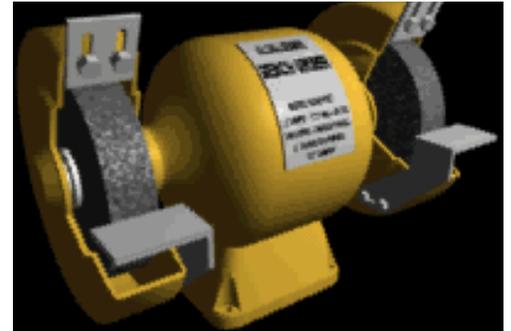
### What Must Be Guarded?

Three main areas require attention: point of operation, power transmission, and other moving parts.

The *point of operation*, such as cutting, shaping, drilling or forming is where the machine performs work on the material.

Power transmission includes all components that transmit energy to the part of the machine performing the work. These components include flywheels, pulleys, belts, connecting rods, couplings, cams, spindles, chains, cranks and gears.

Moving parts must also be guarded; these are parts of the machine that move while the machine is working. These include reciprocating, rotating and transverse moving parts, as well as feed mechanisms and auxiliary parts of the machine.



### Requirements for Guards

According to OSHA, machine guards must meet the following minimum general requirements: They must prevent worker contact with moving parts; be secure; create no new hazards; cause no interference with machine operation, and allow for safe machine lubrication.

**Prevent Contact:** The guard must prevent hands, arms, and any other part of a worker's body from making contact with dangerous moving parts.

**Secure:** Workers should not be able to easily remove or tamper with the guard. The guards should be made of durable material that will withstand the conditions of normal use, and must be firmly attached to the machine.



**No New Hazards:** Guards defeat their own purpose if they create hazards of their own. The edges of guards, for example, should be rolled or bolted to eliminate sharp edges.

**No Interference:** A guard that prevents a worker from performing a job quickly and comfortably may be overridden or disregarded. Proper guarding can actually enhance efficiency.

**Safe Lubrication:** If possible, a worker should be able to lubricate the machine without removing the guard. Locating oil reservoirs outside the

guard, with a line leading to the lubrication point, will reduce the need for workers to enter the hazardous area.

## Types of Machine Guards

OSHA calls the entire range of machine protection options “machine safeguarding.” Guarding refers to the several types of physical barriers that limit access to points of operation and moving parts.

There are a number of ways to guard machinery. “Fixed” guards are designed to stay in place at all times and are usually not adjustable. A variety of interlocked, adjustable and self-adjusting guards are available for some machines and operations. Other guarding mechanisms (but not “machine guards”) include devices that sense the presence of someone in the point of operation; devices that restrain or pull back the operator; dual-handed trip switches, and interlocking gates.

Other ways of protecting workers from machinery include distance; for example, through barriers and railings, and the use of automatic feeding and ejecting devices that eliminate the need for workers to come near the point of operation.

Automatic feed systems with totally enclosed moving parts provide maximum protection. The regulatory trend is to rely increasingly on original engineering rather than added devices.