

## **MACHINE GUARDING BASICS**

Machines & power tools have moving parts that can cut or crush your workers. Some may have moving belts that can catch a worker's clothing or body. Others may hurl objects or sparks. To reduce the chance of injuries, you should make sure they have adequate safeguards to keep your workers out of harm's way. You should also train your workers in the proper use of safeguards & never to remove them unless appropriate lockout/tagout procedures have been put into place first. You may obtain replacement or retrofit safeguards from machinery & equipment manufacturers & sellers. Your workers may be able to fashion satisfactory safeguards, as well. Whether you are maintaining your safeguards or are planning to purchase or produce them, you should keep the following ideas in mind.

**Items needing safeguarding include** moving parts that can cut or pinch, or catch workers' clothing or body parts & draw them into a danger area. Such items may be pulleys & shafts, grinding wheels, chains, & gears forming nip points that can pinch or crush fingers, reciprocating saw blades, machines having moving parts that can hurl fragments (*e.g. saw, grinder*), & machines with moving belts (*e.g. air compressor*).

**Dangerous machine motions** include rotation (*e.g. circular saws*), in-running nip (*e.g. grinder or rolls*), transverse (*e.g. belt moving in continual straight line*), & reciprocation (*e.g. saw blade moving up & down*).

**Dangerous machine actions** include cutting, shearing, bending, & punching.

**Safeguards should** prevent contact (*to keep body parts out of danger area*), be secure (*so workers cannot easily remove or bypass them*), create no interference (*so worker will not be tempted to remove or bypass them*), allow safe lubrication without the need to remove them, protect against falling items (*so they will not fall into moving parts*), & create no additional hazards (*e.g. have no sharp edges that can harm worker*). Safeguards include guards, safety controls, devices, location/distance, & gates.

**Guards** may be self-adjustable (*e.g. on hand-held circular saw that adjusts to varying thicknesses of wood*), adjustable (*accommodate different sizes of stock*), interlocked (*automatically shut off machine if guard is removed or opened & prevent restarting machine until guard is put back*), or fixed (*permanent parts of machine*).

**Safety Controls** include two-handed controls (*e.g. must push both buttons to operate machine, which keeps both hands away from moving parts*) & emergency stop devices (*e.g. push bars*)

**Devices** include restraints (*to allow hands to move only outside danger area*), pullbacks (*cables interconnected to moving parts which force hands out of way as moving parts approach the danger area*), presence sensors (*e.g. light beam which prevents part from moving into danger area if worker's hand or other obstruction is present*), & electromechanical sensors (*prevent moving parts from entering danger zone if sensor obstructed by body part or stock*).

**Location/distance** safeguards workers by placing moving parts machines out of workers' way (*e.g. placing compressor in locked room so workers do not get caught in its belt*).

**Gates** can be opened to allow access when the machine parts are still & can be closed before they start moving.

**You should require your workers** to always use & never to discard or bypass safeguards, even if they think the safeguards slow their work. You should enforce this requirement. You should also ask your workers for ideas about how to safeguard moving parts. Often, people who work with machinery or equipment on a daily basis have useful perceptions about hazards & how to eliminate or reduce them while increasing productivity.

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