

N. Machine Safeguarding Requirements

1. Flywheels

- a. All parts of flywheels which are 7' or less above the floor or working platform shall be guarded.
- b. Screens shall be placed in front of all flywheel spokes to protect against accidental contact by pipe, bars, rods, and similar materials.
- c. Flywheel pits shall be surrounded with a standard railing and a toe-board not less than 6" high with standard railing, toe-board, and spoke guard showing.

2. Machine Guards

- a. Where guard or enclosure is within 2" of moving parts, openings through the guard shall not be $>3/8"$.
- b. If guards are $>4"$ and less than $<15"$ from moving parts, then the largest opening shall not be $>2"$. Where slatted guards are used, the opening shall not be $>1"$.
- c. Inclined belt guards shall be installed so that the vertical clearance between the lower run of the belt and the floor shall not be $<7'$ at any point outside of the guard.
- d. Any panel in a guard exceeding 6 ft² or 42" in either dimension shall be supported by an additional frame member.
- e. A standard railing placed not $<15"$ nor $>20"$ from a flywheel, is acceptable; but a railing shall not be used where other types of guards are specifically required such as guards for gears, sprockets, and V-belts.
- f. When frequent oiling must be done inside the guard, openings with hinged or sliding self-closing covers shall be provided. All points not readily accessible shall have oil fed tubes or grease gun connections outside the guard if lubricant is to be added while machinery is in motion.
- g. Self-lubricating bearings are recommended.

3. Gears, Sprockets, Friction Drives

- a. All gears or sprockets shall be completely enclosed or shall be guarded with side flanges extending inward beyond the roots of the teeth.
- b. All spokes on open web gears, sprockets, or friction drives shall be guarded to prevent accidental contact.
- c. The contact points of all friction drives must be enclosed.

4. Belt, Chain or Rope Drives

- a. Single or multiple V-belts, located 7' or less from the floor or working platform shall be completely enclosed.

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- b. Belt, chain, or rope drives 7' or less above the floor or platform shall be guarded. The guard shall extend to at least 15" above the belt or to a height of 7'; however, where both runs of a horizontal belt are 42" or less from the floor, the belt shall be fully enclosed.
- c. Overhead horizontal drives with a lower run of 7' or less from the floor or platform shall be guarded on the bottom and sides to a height of not <7', or 15" above the lower run.
- d. Horizontal flat belts and chain or rope drives, regardless of height above the floor or platform, shall be guarded for the entire length if located over passageways or workplaces. The guards shall follow the line of the pulley to the ceiling or to the nearest wall, thus enclosing the belt effectively. Where this is impractical, the guard shall enclose the top and bottom runs of the belt and the faces of the pulleys. The guards shall be of sufficient strength to restrain broken belts or drives.

5. Shafting

- a. All horizontal shafting 7' or less from the floor, working platforms, or runways shall be guarded.
- b. All vertical or inclined shafting 7' or less from the floor, working platforms, or runways shall be guarded.
- c. Shafting under benches or tables shall (1) be completely enclosed, or (2) be guarded by a trough which shall extend at least 2" above or below the shafting; open space is not to exceed 6" below the table or above the floor, or (3) be protected with a rigid guard from the underside of the bench to 2" below the bottom line of shafting.
- d. Projecting shaft ends lower than 7' from the ceiling or story base shall either be cut off smooth within one-half the diameter of the shaft or shall be guarded by a non-rotating guard.
- e. Unused keyways shall be filled, covered, or guarded.

6. Belt Conveyors

- a. Means for stopping the motor or engine shall be provided at the operator's station and also at the motor or engine.
- b. Conveyor systems shall be equipped with an audible warning system to be sounded immediately before starting up the conveyor.
- c. Emergency stop switches shall be arranged so that the conveyor cannot be started again until the actuating loop switch has been reset to running or "ON" position.
- d. All conveyors passing over occupied locations shall be guarded so as to prevent material from falling.
- e. All belt conveyor head, tail, tension, and dip take-up pulleys shall be guarded to cover the entire sides of the pulleys and along the run of the belt a sufficient distance so that a person cannot reach behind the guard and become caught in the nip point between the belt and pulley.