

## **4123:1-5-04 Mechanical power transmission apparatus.**

### (A) Scope.

This rule applies to mechanical power transmission apparatus and facilities to transmit power to operating equipment or machine tools. This rule shall not be construed as being applicable to power transmission facilities located within the frame or the equipment and exposure is necessary to its operation or adjustment.

### (B) Reserved.

### (C) Belts and pulleys.

#### (1) Horizontal belts (not including conveyors or conveyor belts).

Horizontal belts and pulleys seven feet or less above floor or platform shall be guarded as follows:

- (a) Where both runs of horizontal belts are seven feet or less from floor level, the guard shall extend to at least fifteen inches above the belt or to a standard height, except that where both runs of a horizontal belt are forty-two inches or less from the floor, the belt shall be fully enclosed in accordance with rule 4123:1-5-99 of the Administrative Code. Note: In power or power development plants a standard guard railing may be used in lieu of this requirement.
- (b) If lower part of belt is seven feet or less above platform or floor level and upper part of belt more than seven feet above platform or floor level, the lower part of belt and pulley shall be guarded on bottom, sides, and ends, to a height of seven feet above floor or platform level. Guarding shall be in accordance with rule 4123:1-5-99 of the Administrative Code.
- (c) Horizontal overhead belts more than seven feet above floor or platform shall be guarded for their entire length under the following conditions:
  - (i) If located over passageways or work places and traveling eighteen hundred feet or more per minute;
  - (ii) If center to center distance between pulleys is ten feet or more;
  - (iii) If belt is eight inches or more in width.
- (d) Where passageway is provided between upper and lower parts of belts, the passageway shall be guarded on sides, top and bottom.

(2) Vertical and inclined belts (not including conveyors or conveyor belts).

Vertical and inclined belts and their pulleys seven feet or less above floor or platform level shall be guarded in accordance with rule 4123:1-5-99 of the Administrative Code.

(3) Vee belts.

Vee belts and their pulleys, where exposed to contact, shall be guarded.

(4) Rope drives.

Rope drives and their pulleys, where exposed to contact, shall be guarded.

(D) Gears, sprockets, link belts, and friction drives.

(1) Set or train of gears.

(a) A set or train of gears is two or more power-driven gears that move and intermesh. This does not apply to adjusting gears which do not normally revolve and are not power operated, or to adjusting gears which require access to the gears for manual manipulation.

(b) Guarding.

All or any part of a set or train of gears seven feet or less above floor or platform level shall be completely guarded or have a band guard around the face of the gear with the side flanges extending inward beyond the root of the teeth. Where there are openings of more than two and one-half inches between arm or through web, the entire gear shall be guarded. Guarding shall be in accordance with rule 4123:1-5-99 of the Administrative Code and shall be securely fastened in place.

(2) Frictional disc, link belt, and sprocket drives.

Frictional disc, link belt, and sprocket drives shall be guarded.

(E) Shafts, collars couplings, and flywheels.

(1) Guarding of horizontal shafting.

(a) All exposed parts of horizontal shafting seven feet or less from floor or working platform, excepting runways used exclusively for oiling or running adjustments, shall be protected by a stationary casing enclosing shafting completely or by a trough enclosing sides and top or sides and bottom of shafting as location requires.

- (b) Shafting under bench machines shall be enclosed by a stationary casing, or by a trough at sides and top or sides and bottom as location requires. The sides of the trough shall come within at least six inches of the underside of table, or if shafting is located near the floor, within six inches of the floor. In every case the sides of the trough shall extend at least two inches beyond the shafting or protuberance.

(2) Guarding vertical and inclined shafting.

Vertical and inclined shafting seven feet or less from floor or work platform, excepting maintenance runways, shall be guarded in accordance with rule-4123:1-5-99 of the Administrative Code.

(3) Projecting shaft ends.

- (a) Projecting shaft ends shall present a smooth edge and end and shall not project more than one-half the diameter of the shaft unless guarded by nonrotating caps or safety sleeves.

- (b) Unused keyways shall be filled up or covered.

(4) Set screws, keys, and other projections.

Set screws, keys, and other projections, protruding beyond the surface of revolving parts shall be guarded.

(5) Collars and couplings.

- (a) Collars.

All revolving collars, including split collars, shall be cylindrical, and screws or bolts used in collars shall not project beyond the largest periphery of the collar.

- (b) Couplings.

Shaft couplings shall be so constructed as to present no hazard from bolts, nuts, setscrews will, however, be permitted where they are covered with safety sleeves or where they are used parallel with the shafting and are countersunk or else do not extend beyond the flange of the coupling.

(6) Universal joints.

Universal joints shall be guarded.

(7) Revolving face plates and chucks.

Revolving face plates and chucks shall be cylindrical with no projecting parts on the rim unless such projecting parts are guarded. This does not apply to those face plates and chucks revolving less than five revolutions per minute.

(8) Flywheels.

Flywheels located so that any part is seven feet or less above floor or platform shall be guarded in accordance with the requirements of paragraphs (E)(8)(a) to (E)(8)(d)(i)(c) of this rule:

- (a) With an enclosure of sheet, perforated, or expanded metal, or woven wire;
- (b) With standard guard railings placed not less than fifteen inches nor more than twenty inches from rim. When flywheel extend into a pit or is within twelve inches of the floor, a standard toeboard shall also be provided.
- (c) When the upper rim of a flywheel protrudes through a working floor, it shall be entirely enclosed or surrounded by a standard guard railing and toeboard.
- (d) Alternate methods.
  - (i) For flywheels with smooth rims five feet or less in diameter, where the preceding methods cannot be applied, the following may be used:
    - (a) A disc attached to the flywheel in such manner as to cover the spokes of the wheel on the exposed side and present a smooth surface and edge, at the same time providing means for periodic inspection;
    - (b) An open space, not exceeding four inches in width, may be left between the outside edge of the disc and the rim of the wheel if desired, to facilitate turning the wheel over;
    - (c) Where a disc is used, the keys or other dangerous projections not covered by disc shall be cut off or covered.
  - (ii) Paragraph (E)(8) of this rule does not apply to flywheels with solid web centers.

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