

RULES AND REGULATIONS

(b) Framework:

(1) Minimum dimensions of material for the framework of all guards except as noted in subparagraph (5) of this paragraph shall be angle iron 1 inch x 1 inch x $\frac{1}{8}$ inch, metal pipe of $\frac{3}{4}$ inch inside diameter or metal construction of equivalent strength.

(2) All guards shall be rigidly braced every 3 feet or fractional part of their height to some fixed part of machinery or building structure. Where guard is exposed to contact with moving equipment additional strength is necessary.

(3) The framework for all guards fastened to floor or working platform and without other support or bracing shall consist of $1\frac{1}{2}$ inch x $1\frac{1}{2}$ inch x $\frac{1}{8}$ inch angle iron, metal pipe or $1\frac{1}{2}$ inch inside diameter or metal construction of equivalent strength. All rectangular guards shall have at least 4 upright frame members each of which shall be carried to the floor and be securely fastened thereto.

(4) Cylindrical guards shall have at least 3 supporting members carried to floor.

(5) Guards thirty inches or less in height and with a total surface not in excess of ten square feet may have a framework of $\frac{3}{8}$ inch solid rod, $\frac{3}{4}$ inch x $\frac{3}{4}$ inch x $\frac{1}{8}$ inch angle or metal construction of equivalent strength. The filling material shall correspond to the requirements of the table contained in paragraph (a) of this section.

(c) The specifications given in paragraphs (a) and (b) of this section are the minimum requirements; where guards are exposed to unusual wear, deterioration or impact, heavier material and construction shall be used to protect amply against the specific hazards involved.

§ 50-204.182 Wood guards.

(a) Wood guards may be used in the woodworking and chemical industries, in industries where the presence of fumes or where manufacturing conditions would cause the rapid deterioration of metal guards; also in construction work and in locations outdoors where extreme cold or extreme heat makes metal guards and railings undesirable. In all other industries, wood guards will not be allowed.

(b) Material and construction.

(1) Wood shall be sound, tough, and free from any loose knots.

(2) Guards shall be made of planed lumber not less than one inch rough board measure and edges and corners rounded off.

(3) Wood guards shall be securely fastened together with wood screws, hard wood dowel pins, bolts, or rivets.

(4) While no definite dimensions are given under this heading for framework or filler materials, wood guards shall be equal in strength and rigidity to metal guards specified in section 50-204.181(a) (b) (c).

(5) For construction of standard wood railing, see section 50-204.185.

§ 50-204.183 Guards for horizontal overhead belts.

(a) Guards for horizontal overhead belts shall run the entire length of the

belt and follow the line of the pulley to the ceiling or be carried to the nearest wall, thus enclosing the belt effectively. Where belts are so located as to make it impracticable to carry the guard to wall or ceiling, construction of the guard shall be such as to enclose completely the top and bottom runs of belt and the face of pulleys. See section 50-204.183 (b) and (c).

(b) The guard and all its supporting members shall be securely fastened to wall or ceiling by gimlet-point lag screws or through bolts. In case of masonry construction, expansion bolts shall be used.

(c) Suitable reinforcement shall be provided for the ceiling rafters or overhead floor beams, where such is necessary, to sustain safely the weight and stress likely to be imposed by the guard. The interior surface of all guards, by which is meant the surface of the guard with which a belt will come in contact, shall be smooth and free from all projections of any character, except where construction demands it; protruding shallow round-head rivets may be used. Overhead belt guards shall be at least one-quarter wider than the belt which they protect, except that this clearance need not in any case exceed 6 inches on each side. Overhead rope drive and block and roller-chain-drive guards shall be not less than 6 inches wider than the drive on each side.

In overhead silent chain-drive guards where the chain is held from lateral displacement on the sprockets, the side clearances required on drives of 20 inch centers or under shall not be less than $\frac{1}{4}$ inch from the nearest moving chain part and on drives of over 20 inch centers a minimum of $\frac{1}{2}$ inch from the nearest moving chain part.

(d) The table following section 50-204.184 gives sizes of materials to be used and general construction of guards for belts 10 inches or more in width. No material for overhead belt guards should be smaller than that specified in this table for belts 10 to 14 inches wide, even if the belt is less than 10 inches in width. However, No. 20 gauge sheet metal may be used as a filler on guards for belts less than 10 inches wide. Expanded metal, because of the sharp edges, shall not be used as a filler in horizontal belt guards.

(e) For clearance between guards and belts, ropes or chains of various center to center dimensions between the shafts, see bottom of table following section 50-204.184.

§ 50-204.184 Guards for horizontal overhead rope and chain drives.

Overhead-rope and chain-drive guard construction shall conform to section 50-204.183 for overhead-belt guard construction of similar width, except that the filler materials shall be of the solid type as shown in table following section 50-204.181(a) unless the fire hazard demands the use of open construction. A side guard member of the same solid filling material shall be carried up in a vertical position 2 inches above the level of the lower run of the rope or chain drive and 2 inches within the periphery

of the pulleys which the guard encloses thus forming a trough. These side filler members shall be reinforced on the edges with $1\frac{1}{2}$ inch x $\frac{3}{4}$ inch flat steel, riveted to the filling material at not greater than 8 inch centers; the reinforcing strip shall be fastened or bolted to all guard supporting members with at least one $\frac{3}{4}$ inch rivet or bolt at each intersection, and the ends shall be secured to the ceiling with lag screws or bolts. The filling materials shall be fastened to the framework of the guard and the filler supports by $\frac{3}{16}$ inch rivets spaced on 4 inch centers. The width of the multiple drive shall be determined by measuring the distance from the outside of the first to the outside of the last rope or chain in the group accommodated by the pulley.

§ 50-204.185 Guard rails and toe boards.

(a) Guard rails shall be 42 inches in height, with mid-rail between top rail and floor.

(b) Posts shall be not more than 8 feet apart; they are to be permanent and substantial, smooth, and free from protruding nails, bolts, and splinters. If made of pipe, the post shall be $1\frac{1}{4}$ inches inside diameter, or larger. If made of metal shapes or bars, their section shall be equal in strength to that of $1\frac{1}{2}$ by $1\frac{1}{2}$ by $\frac{3}{16}$ inch angle iron. If made of wood, the posts shall be 2 x 4 inches or larger. The upper rail shall be 2 x 4 inches or two 1 x 4 strips, one at the top and one at the side of posts. The mid-rail shall be 1 x 4 inches or more. The rails (metal shapes, metal bars, or wood), shall be on that side of the posts which gives the best protection and support. Where panels are fitted with expanded metal or wire mesh as noted in table, section 204.181 the middle rails may be omitted. Where guard is exposed to contact with moving equipment, additional strength may be necessary.

(c) Toe boards shall be 4 inches or more in height, of wood, metal, or of metal grill not exceeding 1 inch mesh.

MISCELLANEOUS MACHINE GUARDING

§ 50-204.190 Lathes and automatic screw machines.

(a) Chucks and face plates shall be free from projections, and dogs, if used, shall be of the safety type only—circular in shape with no projections beyond the periphery.

(b) Chip guards to catch flying chips, particularly in the case of the high speeds used in the softer metals, shall be provided.

(c) Rotating stock in turret lathes and automatic screw machines shall be completely enclosed in pipe long enough to contain the longest stock used.

(d) Suitable shields and oil catchers shall be provided to prevent slipperiness from oil thrown from the automatic screw machines.

§ 50-204.191 Drill presses.

(a) All projections on the rotating spindle and as much as possible of the spindle itself should be guarded.

(b) Spindle drive belts, when in range of the operator's head or body, shall be guarded to protect the operator from both contact and breakage.