

TABLE O-2—EXPOSURE VERSUS WHEEL THICKNESS
[In inches]

Overall thickness of wheel (T)	Maximum exposure of wheel (C)
1/2	1/4
1	1/2
2	3/4
3	1
4	1 1/2
5 and over	2

TABLE O-4—MINIMUM DIMENSIONS FOR STRAIGHT UNRELIEVED FLANGES FOR WHEELS WITH THREADED INSERTS OR PROJECTING STUDS

A—Diameter of wheel	B ¹ —Minimum outside diameter of flange	T—Minimum thickness of flange
1	5/8	1/8
2	1	1/8
3	1	3/16
4	1 1/8	3/16
5	1 3/4	1/4
6	2	3/8

¹ NOTE: Must be large enough to extend beyond the bushing. Where prong anchor or cupback bushing are used, this footnote does not apply.

[39 FR 23502, June 27, 1974, as amended at 43 FR 49750, Oct. 24, 1978; 49 FR 5323, Feb. 10, 1984; 61 FR 9240, Mar. 7, 1996]

§ 1910.216 Mills and calenders in the rubber and plastics industries.

(a) *General requirements*—
(1)–(2) [Reserved]

(3) *Auxiliary equipment.* Mechanical and electrical equipment and auxiliaries shall be installed in accordance with this section and Subpart S of this part.

(4) *Mill roll heights.* All new mill installations shall be installed so that the top of the operating rolls is not less than 50 inches above the level on which the operator stands, irrespective of the size of the mill. This distance shall apply to the actual working level, whether it be at the general floor level, in a pit, or on a platform.

(b) *Mill safety controls*—(1) *Safety trip control.* A safety trip control shall be provided in front and in back of each mill. It shall be accessible and shall operate readily on contact. The safety trip control shall be one of the following types or a combination thereof:

(i) *Pressure-sensitive body bars.* Installed at front and back of each mill

having a 46-inch roll height or over. These bars shall operate readily by pressure of the mill operator's body.

(ii) *Safety trip rod.* Installed in the front and in the back of each mill and located within 2 inches of a vertical plane tangent to the front and rear rolls. The top rods shall be not more than 72 inches above the level on which the operator stands. The tripods shall be accessible and shall operate readily whether the rods are pushed or pulled.

(iii) *Safety tripwire cable or wire center cord.* Installed in the front and in the back of each mill and located within 2 inches of a vertical plane tangent to the front and rear rolls. The cables shall not be more than 72 inches above the level on which the operator stands. The tripwire cable or wire center cord shall operate readily whether cable or cord is pushed or pulled.

(2) [Reserved]

(3) *Auxiliary equipment.* All auxiliary equipment such as mill divider, support bars, spray pipes, feed conveyors, strip knives, etc., shall be located in such a manner as to avoid interference with access to and operation of safety devices.

(c) *Calender safety controls*—(1) *Safety trip, face.* A safety trip rod, cable, or wire center cord shall be provided across each pair of in-running rolls extending the length of the face of the rolls. It shall be readily accessible and operate whether pushed or pulled. The safety tripping devices shall be located within reach of the operator and the bite.

(2) *Safety trip, side.* On both sides of the calender and near each end of the face of the roll, there shall be a cable or wire center cord connected to the safety trip. They shall operate readily when pushed or pulled.

(d) *Protection by location*—(1) *Mills.* Where a mill is so installed that persons cannot normally reach through, over, under, or around to come in contact with the roll bite or be caught between a roll and an adjacent object, then, provided such elements are made a fixed part of a mill, safety control devices listed in paragraph (b) of this section shall not apply.

(2) *Calenders.* Where a calender is so installed that persons cannot normally reach through, over, under, or around

to come in contact with the roll bite or be caught between a roll and an adjacent object, then, provided such elements are made a fixed part of a calender, safety control devices listed in paragraph (c) of this section shall not apply.

(e) *Trip and emergency switches.* All trip and emergency switches shall not be of the automatically resetting type, but shall require manual resetting.

(f) *Stopping limits—(1) Determination of distance of travel.* All measurements on mills and calenders shall be taken with the rolls running empty at maximum operating speed. Stopping distances shall be expressed in inches of surface travel of the roll from the instant the emergency stopping device is actuated.

(2) *Stopping limits for mills.* All mills irrespective of the size of the rolls or their arrangement (individually or group-driven) shall be stopped within a distance, as measured in inches of surface travel, not greater than 1½ percent of the peripheral no-load surface speeds of the respective rolls as determined in feet per minute.

(3) *Stopping limits for calenders.* (i) All calenders, irrespective of size of the rolls or their configuration, shall be stopped within a distance, as measured in inches of surface travel, not greater than 1¾ percent of the peripheral no-load surface speeds of the respective calender rolls as determined in feet per minute.

(ii) Where speeds above 250 feet per minute as measured on the surface of the drive roll are used, stopping distances of more than 1¾ percent are permissible. Such stopping distances shall be subject to engineering determination.

[39 FR 23502, June 27, 1974, as amended at 49 FR 5323, Feb. 10, 1984; 61 FR 9240, Mar. 7, 1996]

§ 1910.217 Mechanical power presses.

(a) *General requirements.*

(1)–(3) [Reserved]

(4) *Reconstruction and modification.* It shall be the responsibility of any person reconstructing, or modifying a mechanical power press to do so in accordance with paragraph (b) of this section.

(5) *Excluded machines.* Press brakes, hydraulic and pneumatic power presses, bulldozers, hot bending and hot metal presses, forging presses and ham-

mers, riveting machines and similar types of fastener applicators are excluded from the requirements of this section.

(b) *Mechanical power press guarding and construction, general—(1) Hazards to personnel associated with broken or falling machine components.* Machine components shall be designed, secured, or covered to minimize hazards caused by breakage, or loosening and falling or release of mechanical energy (i.e. broken springs).

(2) *Brakes.* Friction brakes provided for stopping or holding a slide movement shall be inherently self-engaging by requiring power or force from an external source to cause disengagement. Brake capacity shall be sufficient to stop the motion of the slide quickly and capable of holding the slide and its attachments at any point in its travel.

(3) *Machines using full revolution positive clutches.* (i) Machines using full revolution clutches shall incorporate a single-stroke mechanism.

(ii) If the single-stroke mechanism is dependent upon spring action, the spring(s) shall be of the compression type, operating on a rod or guided within a hole or tube, and designed to prevent interleaving of the spring coils in event of breakage.

(4) *Foot pedals (treadle).* (i) The pedal mechanism shall be protected to prevent unintended operation from falling or moving objects or by accidental stepping onto the pedal.

(ii) A pad with a nonslip contact area shall be firmly attached to the pedal.

(iii) The pedal return spring(s) shall be of the compression type, operating on a rod or guided within a hole or tube, or designed to prevent interleaving of spring coils in event of breakage.

(iv) If pedal counterweights are provided, the path of the travel of the weight shall be enclosed.

(5) *Hand operated levers.* (i) Hand-lever-operated power presses shall be equipped with a spring latch on the operating lever to prevent premature or accidental tripping.

(ii) The operating levers on hand-tripped presses having more than one operating station shall be interlocked