4123:1-13-01 **Scope and definitions.**

(A) Scope.

The purpose of these safety requirements is to provide reasonable safety for life, limb and health of employees. In cases of practical difficulty or unnecessary hardship, the Ohio bureau of workers' compensation may grant exceptions from the literal provisions of these requirements or permit the use of other devices or methods when, in the opinion of the industrial commission, equivalent protection is thereby secured.

These specific requirements supplement those of Chapter 4123:1-5 of the Administrative Code, "Specific Safety Requirements of the Ohio Bureau of Workers' Compensation Relating to All Workshops and Factories," and are minimum requirements of an employer for the protection of such employer's employees and no others and apply to the rubber and plastic industries where ~~crude, synthetic, or reclaimed~~ rubber or plastics are processed.

Equipment used in the laboratory varies greatly from manufacturing equipment in size, speed, and height and is specifically excepted from the detailed provisions of these requirements; however, equivalent protection shall be provided.

Installations or constructions built or contracted for prior to the effective date of any requirement shall be deemed to comply with the provisions of these requirements if such installations or constructions comply either with the provisions of these requirements or with the provisions of any applicable specific requirement which was in effect at the time contracted for or built.

(B) Definitions.

(1) "Approved" means accepted or certified by a nationally recognized testing agency, such as "Underwriters' Laboratories," "Factory Mutual Engineering Corporation," or a responsible governmental agency.

(2) "Bite" ("nip point") means the point of meeting between any two in-running rolls.

(3) "Calender" means a machine equipped with two or more metal rolls revolving in opposite directions and used for continuously sheeting or plying up rubber or plastic compounds and for frictioning or coating fabric with rubber or plastic compounds.

(4) "Danger zone" means the point of operation where a known critical hazard exists.

(5) "Factor of safety" means the ratio between the ultimate breaking stress and the working stress of the material, structure or device. For example, the term "factor of safety of four" means that the material, structure or device shall be constructed of such strength that the maximum load will be one-fourth the designed ultimate breaking load. Where other factors of safety appear, they shall apply in the same manner. The standards of the "American Society for Testing Materials" shall be used in determining the strength of material except as otherwise provided herein.

(6) "Guard" means the covering, fencing, railing, or enclosure which shields an object from accidental contact.

(7) "Guarded" means that the object is covered, fenced, railed, enclosed or otherwise shielded from accidental contact.

(8) "Mill" means a machine consisting of two adjacent, heavy rolls, set horizontally, which revolve in opposite directions (i.e., toward each other as viewed from above) used for the mechanical working of rubber or plastic.

(9) "Operator" means any employee assigned or authorized to work at the specific equipment.

(10) "Pinch point" ("shear point") means any point at which it is possible to be caught between the moving parts of a machine, or between the moving and stationary parts of a machine, or between the material and the moving part or parts of a machine.

(11) "Point of operation" means the ~~point or points at which the material is placed in or removed from the machine.~~ area on a machine where work is actually performed upon the material being processed.

(12) "Securely fastened" means that the object or thing referred to shall be substantially fixed in place.

(13) "Safety trip" means a device for stopping the travel of rolls when the device is actuated in an emergency.

(14) "Shall" is to be construed as mandatory.

(15) "Substantial" means construction of such strength, of such materials, and of such workmanship that the object will withstand the wear, usage, or shock for which it is designed.

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4123:1-13-02 **Mills.**

(A) Mill roll height.

All mills shall be installed so that the top of the operating rolls is no less than fifty 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 emergency stop controls.

(1) Safety trip control.

A safety trip control shall be provided in front and in back of each mill to stop the mill when it is tripped. 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.

(a) Pressure-sensitive body bars.

Installed at front and back of each mill having a roll height of forty-six inches or more, these bars shall operate readily by pressure of the mill operator's body.

(b) Safety trip rod.

Installed in the front and in the back of each mill and located within two inches of a vertical plane tangent to the front and rear rolls. The trip rods shall be within easy reach of the operator but no more than seventy-two inches above the level on which the operator stands. The trip rods shall be accessible and shall operate readily whether the rods are pushed or pulled.

(c) Safety trip wire cable or wire center cord.

Installed at the front and back of each mill and located within two inches of a vertical plane tangent to the front and rear rolls. The cables shall be within easy reach of the operator but no more than seventy-two inches above the level on which the operator stands. The trip wire cable or wire center cord shall operate readily whether cable or cord is pushed or pulled.

(d) Fixed guards.

Where a safety trip rod, safety trip wire cable, or wire center cord is used, a fixed bar across the front and one across the back of the mill approximately forty inches vertically above the working level and twenty inches horizontally from the crown face of the roll shall be used.

(2) Other equipment.

All other equipment, such as a 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 or operation of safety devices.

(C) Protection by location.

Where a mill is so installed that employees 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 rule shall not apply.

(D) Trip and emergency switches.

All trip and emergency switches shall not be of the automatically resetting type, but shall require manual resetting.

(E) Emergency stopping limits.

(1) Determination of distance of travel.

All measurements on mills 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) When tripped by the emergency stopping device all mills, irrespective of the size of the rolls or their arrangement (individually or group-driven), shall stop within a distance, as measured in inches of surface travel, no greater than one and one-half per cent of the peripheral no-load surface speeds of the respective rolls as determined in feet per minute. (See "Figure 1.")

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4123:1-13-03 **Calenders.**

(A) 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 shall operate whether pushed or pulled. The safety tripping devices shall be located within easy reach of the operator and no more than seventy-two inches above the level on which the operator stands.

(2) Safety trip, side.

On both sides of the calender and near each end of the face of the rolls, there shall be a cable or wire center cord connected to the safety trip. These lines shall be no more than twelve inches from the faces of the respective rolls and no less than two inches from the calender frame. They shall be anchored to the frame no more than six inches from the floor or operator's platform and shall operate readily when pushed or pulled.

(B) Protection by location.

Where a calender is so installed that employees 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 (A) of this rule shall not apply.

(C) Trip and emergency switches.

All safety trip and emergency switches shall not be of the automatically resetting type, but shall require manual resetting.

(D) Stopping limits for calenders.

(1) Determination of distance of travel.

Measurements on calenders shall be taken on the drive roll. All measurements shall be taken with the rolls running empty at maximum operating speed. Measurements shall start when the safety device is tripped.

(2) Stopping limits.

(a) All calenders, irrespective of size of the rolls or their configuration, shall stop within a distance, as measured in inches of surface travel, no greater than one and three-quarters per cent of the peripheral no-load surface speeds of the respective calender rolls as determined in feet per minute. (See "Figure 2.")

(b) Where speeds above two hundred fifty feet per minute, as measured on the surface of the drive roll are used, stopping distances of more than one and three-quarters per cent are permissible. Such stopping distances shall be subject to engineering determination.

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4123:1-13-04 **Other rubber and plastic processing machines.**

(A) Extruders, strainers and tubing machines.

(1) Manually fed extruders, strainers and tubing machines shall have a hopper so designed as to allow a distance of no less than ten inches from the top edge of the hopper to the highest point of the screw or worm of the extruder, strainer or tubing machine.

(2) Rotating knives that may be located at the discharge end of extruders, strainers and tubing machines shall be guarded with interlocks provided to shut off the power if the guard is opened or removed.

(B) Rubber and plastic cutters.

(1) Cutters - circular cut-off power knives or blades.

Circular cut-off power knives or blades, used to cut rubber or plastic stock to length, shall be guarded.

(2) Manually fed guillotine bale cutters.

All manually fed guillotine bale cutters shall be equipped with a two-hand continuous control or a one-hand continuous control so located that the operator cannot reach the control and the danger zone at the same time.

(C) Wind-ups and power driven auxiliary rolls or drums.

Wind-ups, power driven auxiliary rolls or drums and festoon rolls, around which material travels, when exposed to contact, shall be provided with readily accessible safety trips or devices to disengage them from their immediate source of power.

(D) Hose winding machines.

Hose winding machines shall have a clutch or starting treadle running the full length of the machine so that the machine will stop automatically when the clutch or starting treadle is released.

(E) Curing or vulcanizing equipment.

An interlocking device shall be provided to prevent the admission of water, steam,

or pressure into the unit before it is fully closed and locked to prevent the unit from being opened while it is under any residual pressure.

(1) Tire vulcanizers.

(a) Single or dual tire vulcanizers, which open and close by electrical power, shall be equipped with a safety bar or other mechanical sensing device installed at or across the front of the curing unit which will prevent the closing motion of the unit should the bar or other safety device be activated by contact with any portion of the employee's body as the unit closes.

(b) Brakes.

Brake capacity shall be sufficient to stop the motion quickly and capable of holding the moving parts at any point in their travel. Where friction brakes, equipped with release devices, are provided for stopping or holding moving parts of a press, postcure inflator, or accessories, they shall be set with compression springs and released by electrical, pneumatic, or mechanical means. Brakes that require electrical or pneumatic power to apply a holding force shall not be used.

(2) Horizontal curing units (vulcanizers).

A locking device shall be provided on doors in the open position to prevent them from closing accidentally on employees working underneath.

(3) Platen presses.

(a) Inserting or removing molds.

Molds shall be provided with lugs or handles for use when inserting or removing the molds from the platen presses by hand, otherwise a hook shall be provided for the purpose.

(b) Track stops.

Where tracks are used with platen presses they shall be equipped with stops to prevent the molds from being pulled or pushed off the tracks.

(c) Work tables.

(i) Stops.

Work tables used with platen presses ranging in sizes up to and including twenty-four inches wide by twenty-four inches long shall be equipped with stops to prevent the molds from being accidentally pulled off the front of the bench.

(ii) Size.

Work tables used with platen presses shall be no smaller than the press platens.

(4) Molding machines.

(a) Compression and transfer molding.

Compression and transfer molding machines shall be equipped with either:

(i) A metal gate which, when closed, completely encloses the molding area between the two front tie rods or side columns of the press and between the fixed and moving platens of the press and which is interlocked so that the press will not operate unless the gate is closed, or

(ii) Two-hand controls which must remain depressed during press closing.

(b) Injection and blow molding.

(i) The molding area of injection and blow molding machines shall be guarded by an interlocked safety door or gate with an insert of safety glass, impact-resistant plastic, or expanded metal.

(ii) Moving parts of the machine and mold not guarded by the safety door or gate shall be guarded by fixed or interlocked guards.

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