DEPARTMENT OF LICENSING AND REGULATORY AFFAIRS
DIRECTOR’S OFFICE
GENERAL INDUSTRY SAFETY STANDARDS

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(By authority conferred on the director of the department of licensing and regulatory affairs  
by sections 16 and 21 of 1974 PA 154, MCL 408.1016 and 408.1021,  
and Executive Reorganization Order Nos. 1996-2, 2003-1, 2008-4,  

R 408.16511 and R 408.16528 of the Michigan Administrative Code are amended as follows:

PART 65. MILLS AND CALENTERS FOR RUBBER AND PLASTIC

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R 408.16501. Scope.

Rule 6501. This part provides for the safe maintenance and operation of mills and calenders  
used in the rubber and plastics trades by employers  
and their safe use by employees, in, around and about  
places of employment.

R 408.16503. Definitions; A to C.

Rule 6503. (1) "Aisle" means a path of designated travel for employees and vehicles.

(2) "Calender" means a machine equipped with 2 or  
more metal rolls in vertical frames and revolving in  
opposite directions used for continuously sheeting or  
plying up rubber and plastic compounds and for  
frictioning or coating materials with rubber and plastic  
compounds.

R 408.16506. Definitions; M to S.

Rule 6506. (1) "Mill" means a machine consisting of 2 adjacent metal rolls, set horizontally, which revolve in  
opposite directions and which are used for the  
mechanical working of rubber and plastic compounds.

(2) “Nip point” means the point where a rotating object creates a pinching action with another rotating object.

(3) “Safety device” means a guard such as, but not limited to, a barrier, enclosure, body bar, safety rod or  
safety cable used to protect an employee from a hazardous condition.

R 408.16511. Employer’s responsibilities.

Rule 6511. An employer shall do all of the following:

(a) Provide training to an employee as to the hazards and safe operation of his assigned job.

(b) Maintain the mills and calenders in a condition free of recognized hazards.
R 408.16512. Employee’s responsibilities.
Rule 6512. An employee shall:
(a) Not use a mill or calender unless authorized and
trained in its use.
(b) Not remove a guard or safety device from a mill
or calender except when necessary for servicing or
where equivalent safety is provided. The guard shall be
replaced before restarting the machine. All safety
devices shall be replaced and tested before a mill or
calender is put back into operation.
(c) Report defective machinery, equipment and
hazardous conditions, when detected, to his
supervisor.

R 408.16515. Illumination.
Rule 6515. Illumination shall be provided to maintain
a minimum of 20 foot-candles intensity at an operator’s
work station.

R 408.16517. Floors and aisles.
Rule 6517. (1) An aisle or floor area around a mill or
calender shall be maintained free of protruding objects,
holes, oil, grease and accumulations of water.
(2) The surface of a platform or floor area at an
operator’s work station shall be maintained in slip
resistant condition.
(3) An aisle for combined usage of employees and
stock moving equipment shall be 3 feet wider than the
widest load moved. The outline of the aisle shall be
marked or otherwise identified. When an oversized
load is moved, pedestrian traffic shall be warned ahead
of the load movement. Where stock moving equipment
is not used in an aisle, the aisle shall not be less than 3
feet wide.

R 408.16521. Installation.
Rule 6521. (1) A mill or calender shall be secured in a
manner to prevent unintentional movement.
(2) Such a machine, except where installed in a
laboratory, shall not be so placed as to require an
operator to stand in an aisle.
(3) A mill installed or moved after the effective date
of this part shall be installed so that the top of the
operating rolls is not less than 50 inches above the
floor or the operator’s working level.
(4) Installation of auxiliary equipment, such as but
not limited to feeding and stock removing equipment
and blending rolls, shall be guarded by location,
barriers or enclosures so as to not create a hazard.
The auxiliary equipment shall not interfere with access
or operation of a safety device.
(5) A mill or calender shall be electrically grounded.

R 408.16523. Hot surfaces.
Rule 6523. Steam and hot water pipes and surfaces
of machinery exposed to contact, except the mill and
calender rolls, which would cause burns, shall be
covered with an insulating material or guarded by a
barrier.

R 408.16525. Ventilation.
Rule 6525. Materials processed on a mill or calender,
which give off noxious or toxic materials that exceed
the maximum allowable limits set by the Michigan
Occupational Safety and Health Administration (MIOSHA), shall be equipped with a ventilation system
approved for this use.

R 408.16527. Maintenance.
Rule 6527. (1) A power source of a mill, calender or
their auxiliary equipment to be repaired, serviced or set
up shall be locked out by each employee doing the work
if unexpected start up would cause injury. Residual pressure shall be relieved before and during
such work when maintenance is performed on a
pressurized system.
(2) A braking or safety device for a mill or calender
shall be inspected and tested weekly. The stopping
distances shall be measured and recorded. Where the
braking action does not meet or exceeds the
requirements of R 408.16542 and R 408.16546,
repairs or adjustments shall be made before operation
is resumed.

R 408.16528. Lubrication.
Rule 6528. Lubrication shall be accomplished by 1 of
the following:
(a) Manually when the machine can be shut off and
locked out.
(b) An automatic pressure or gravity feed system.
(c) An extension pipe leading to an area outside of
guards or away from any hazard.
(d) Other means providing safety equal to or
exceeding subdivision (a), (b), or (c) of this rule.

R 408.16531. Steam pressure procedures.
Rule 6531. (1) Where a pressure reducing valve is
used, not less than 1 relief valve, set at not more than
the rated pressure of the equipment, shall be provided
adjacent to the reducing valve on the low pressure
side. The relief valve shall vent to an area which will
not create a hazard to an employee.
(2) A steam valve to machinery shall be opened
slowly to avoid uneven expansion of a pressure
chamber.
(3) A cylinder type machine shall be in motion
before steam is admitted.
(4) The rated operating steam pressure of a
machine shall not be exceeded.
R 408.16541. Mill safety devices.
Rule 6541. (1) Except where an employee cannot come in contact with a roll nip point or be caught between a roll and an adjacent object because of a fixed installation, a mill shall be provided with 1 of the following safety trip devices to activate breaking equipment:
   (a) A pressure sensitive bar which can be tripped by not more than a 40 pound pressure of an employee’s body. The bar shall be installed at the front and back of the mill across the length of the rolls of each mill roll having a height of 46 inches or more. (See figure 1)
   (b) A safety rod or safety cable installed at the front and back of a mill and located within 2 inches of a vertical plane tangent to the front and rear rolls. The safety rod or cable shall not be more than 72 inches from the floor of the operator’s work level and operate with either a push or pull motion.

FIGURE 1

Installation of Pressure-Sensitive Body Bar

This illustration shows relative position of a man to the pressure-sensitive body bar and the working roll. The body bar is positioned so that the man cannot reach the danger point on the face of the roll without tripping the safety switch.

The danger point is determined as follows:
   W represents the thickness of a man’s fingers.
   X represents the maximum allowable stopping distance.
   Y and Z dimensions are such that the man cannot reach the danger point.

A force equal to approximately 40 lbs (in the direction of the arrow) is required to actuate the safety switch.

(2) A mill having automatic overhead blending rolls shall have the blender interlocked to the mill so that actuation of the mill safety device will stop the blender.

(3) A safety device, after actuation, shall require manual resetting.

(4) A laboratory mill may be guarded by an interlocked barrier in lieu of the requirements of subrule (1).
R 408.16542. Mill stopping limits.

Rule 6542. A mill, regardless of roll size or roll arrangement, shall be stopped by braking equipment within a distance, measured in inches of surface travel of the faster roll, of not more than 1 1/2% of the peripheral no-load surface speed of the roll as determined in feet per minute. (See figure 2)

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 faster roll from the instant the emergency stopping device is actuated.

FIGURE 2

MAXIMUM ALLOWABLE MILL STOPPING DISTANCES
FOR VARIOUS ROLL SPEEDS
R 408.16545. Calender safety devices.

Rule 6545. (1) Except where an employee cannot come in contact with a roll nip point or be caught between a roll and an adjacent object because of a fixed installation, a calender shall be provided with the following safety trip devices to actuate braking equipment:

(a) A safety rod or cable located across each pair of inrunning rolls and extending the length of the rolls. The device shall operate with either a push or pull motion. The safety tripping devices shall be located within reach of the operator at the bite.

(b) A safety cable shall be run vertically on both sides of the calender and connected to the safety switch. The cable shall be not more than 12 inches from the face of the rolls and not less than 2 inches from the calender frame. The cable shall be anchored not more than 6 inches from the floor and operated with either a push or pull motion.

(2) A safety device, after actuation, shall require manual resetting.

R 408.16546. Calender stopping limits.

Rule 6546. A calender, regardless of size or configuration, shall be stopped by braking equipment within a distance, measured in inches of surface travel of the fastest roll, of not more than 1 3/4% of the peripheral no-load surface speed of the calender rolls as determined in feet per minute. (See figure 3)

All measurements on 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 fastest roll from the instant the emergency stopping device is actuated.

FIGURE 3

MAXIMUM ALLOWABLE CALENDER STOPPING DISTANCES FOR VARIOUS ROLL SPEEDS

[Graph showing maximum allowable calender stopping distances for various roll speeds]
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