

Chapter IV

Rule	Description
Rule 67	<u>Further Safety precautions</u>
Schedule I	<u>Textile Machinery except Machinery used in Jute Mills.</u>
Schedule II	<u>Jute Mill</u>
Schedule III	<u>Cotton Ginning Machinery</u>
Schedule IV	<u>Wood Working Machinery</u>
Schedule V	<u>Rubber Mills and Plastic Mills</u>
Schedule VI	<u>Centrifugal Machines</u>
Schedule VII	<u>Power press</u>
Schedule VIII	<u>Shears, Slitters and Guillotine Machines</u>
Schedule IX	<u>Agitators and Mixing Machines</u>
Schedule X	<u>Leather, Plastic and Rubber Stripper Machines</u>
Schedule XI	<u>Special Rule for Printing Presses</u>
Schedule XII	<u>All factories</u>
Rule 68	<u>Register of workers employed for work on or near machinery in motion</u>
Rule 69	<u>Tight fitting clothing</u>
Rule 70	<u>All Belts etc. to be examined regularly</u>
Rule 71	<u>Employment of young persons on dangerous machines</u>
Rule 72	<u>Hoists and Lifts</u>
Rule 73	<u>Lifting machines, chains, ropes and lifting tackles</u>
Rule 74	<u>Pressure vessels or plant</u>
Rule 75	<u>Water-sealed gasholder</u>
Rule 76	<u>Excessive weights</u>
Rule 77	<u>Protection of eyes</u>
Schedule I	<u>Risk of injury to eyes from particles</u>
Schedule II	<u>Risk of injury to eyes by reason of exposure to excessive light</u>
Rule 78	<u>Minimum dimensions of man-holes</u>
Rule 79	<u>Exemptions. The requirements of sub-section (4) of section 37 shall not apply to the following processes carried on in any Factory</u>
Rule 80	<u>Fire protection</u>
Rule 81	<u>Means of Escape for Cotton Ginning Factories</u>
Rule 82	<u>Fire-fighting apparatus and water supply</u>
Rule 83	<u>Ladders</u>
Rule 84	<u>Protection of workers attending to prime movers</u>
Rule 85	<u>Polymerizing or Curing Machine</u>
Rule 86	<u>Safety Measure in Factories where Equipments of Pipelines containing Inflammable Materials are Operated</u>
Rule 87	<u>Safety Measure in Gas Works</u>
Rule 88	<u>Fragile Roofs-provision of Crawling Boards etc.</u>
Rule 89	<u>Special Safety Precautions for Certain Highly Hazardous Chemical Process</u>
Rule 90	<u>Planting of Trees</u>
Rule 91	<u>Hand Protection</u>
Rule 92	<u>Head Protection</u>
Rule 92A	<u>Protective equipment</u>
Rule 93	<u>Provision of Safety Belts and Life-lines</u>
Rule 94	<u>Ovens and Driers</u>

Rule 95	<u>Reaction vessels and kettles</u>
Rule 96	<u>Examination of eye sight of certain workers</u>
Rule 97	<u>Railways in factories</u>
Rule 98	<u>Safety Committee</u>
Rule 99	<u>Site Appraisal Committee</u>
Rule 100	<u>Health and Safety Policy</u>
Rule 101	<u>Collection And Development And Dissemination of Information (Rules made under Sec 41B and 112, Material Safety Data Sheet)</u>
Rule 102	<u>Disclosure Of Information Of Workers</u>
Rule 103	<u>Disclosure Of Information To The Chief Inspector</u>
Rule 104	<u>Information On Industrial Wastes</u>
Rule 105	<u>Review Of The Information Furnished To Workers Etc</u>
Rule 106	<u>Confidentiality Of Information</u>
Rule 107	<u>Medical Examination</u>
Rule 108	<u>Occupational Health Centres</u>
Rule 109	<u>Ambulance Van</u>
Rule 110	<u>Decontamination Facilities</u>
Rule 111	<u>Making Available Health Records To Workers</u>
Rule 112	<u>Ambulance Van</u>
Rule 113	<u>Issue Of Guidelines</u>
Rule 114	<u>Quality of personal protective equipment</u>
Rule 115	<u>Protective equipment</u>
Rule 116	<u>Thermic Fluid Heaters</u>

Rule 67. Further Safety precautions.

Without prejudice to the provisions of sub-section (i) of section 21 in regard to the fencing of machines, further precautions specified in the schedules annexed hereto shall apply to the machines noted in each schedule.

Schedule 1

Textile Machinery except Machinery used in Jute Mills.

1. Application – The requirement of this schedule shall apply to machinery in factories engaged in the manufacture or processing of textiles other than jute textiles.
2. Definitions – For the purposes of this schedule-
 - a) “Calendar” means a set of heavy rollers mounted on vertical side frames and arranged to pass cloth between them. Calendars may have two to ten rollers, or howls, some of which can be heated.
 - b) “Embossing calendar” means a calendar with two or more rolls, one of which is engraved for producing figure effects of various kinds on a fabric.
 - c) “Card” means a machine consisting of cylinders of various sizes – and in certain cases flats – covered with card clothing and set in relation to each so that fibers in staple form may be separated into individual relationship. The speed of the cylinders and their direction of rotation varies. The finished product is delivered as a silver. Cards of different types are : the revolving flat card, the roller and clearer card, etc.
 - d) “Card Clothing” means the material with which the surfaces of the cylinder, doffer, flats, etc. of a card are covered and consists of a thick

foundation material made of, either textile fabrics through which are pressed many fine closely spaced, specially bent wires, or mounted saw toothed wire.

- e) “Comber” means a machine for combining fibers of cotton, wool, etc. The essential parts are device for feeding forward a fringe of fibers at regular intervals and an arrangement of combs or pins, which, at the right time, pass through the fringe. All tangled fibres, short fibres, and nips are removed and the long fibres are laid parallel.
- f) “combing machinery” means a general classification of machinery including combers, sliver lap machines, ribbon lap machines, and gill boxes, but excluding cards.
- g) “Rotary staple Cutter” means a machine consisting of one or more rotary blades used for the purpose of cutting textile fibres into staple lengths.
- h) “Garnett machine” means any of a number of types of machines for opening hard twisted waste of wool, cotton, silk, etc. Essentially, such machines consist of a licker-in ; one or more cylinders, each having a competent worker and stripper rolls; and a fancy roll and doffer. The action of such machines is somewhat like that of a wool card, but it is much more severe in that the various rolls are covered with garnett wire instead of card clothing.
- i) “Gill Box” means a machine used in the worsted system of system of manufacturing yarns. Its function is to arrange fibres in parallel order. Essentially, it consists of a pair of feed rolls and a series of followers where the followers move at a faster surface speed and perform a combing action.
- j) “In-funneling rolls” means any pair of rolls or drums between which there is a “nip”.
- k) “Interlocking arrangement” means a device that prevents the setting in motion of a dangerous part of a machine or the machine itself while the guard cover or door provided to safeguard against danger is open or unlocked, and which will also hold the guard, cover or door closed and locked while the machine or the dangerous part is in motion.
- l) “kier” means a large metal vat, usually a pressure type, in which fabrics may be boiled out, bleached, etc.
- m) “Ribbon lapper” means a machine or a part of a machine used to prepare laps for feeding a cotton comb ; its purpose is to provide a uniform lap in which the fibres have straightened as much as possible.
- n) “Silver lapper” means a machine or a part of a machine in which a number of parallel card slivers are drafted slightly, laid side by side in a compact sheet, and wound into a cylindrical package.
- o) “Loom” means a machine for effecting the interlocking of two series of yarns crossing one another at right angles. The warp yarns are wound on a warp beam and pass through headless and reeds. The filling is shot across in a shuttle and settled in place by reeds and slay and the fabric is wound on a cloth beam.
- p) “Starch mangle” means a mangle that is used specifically for starching cotton goods. It commonly consists of two large rolls and a shallow open vat with several immersion rolls. The vat contains the starch solution.
- q) “Water mangle” means a calendar having two or more rolls used for squeezing water from fabrics before drying. Water mangles also may be used in other ways during the finishing of various fabrics.

- r) “Mule” means a type of spinning frame having a head stock and a carriage as its two main sections. The head stock is stationary. The carriage is movable and it carries the spindles which draft and spin the roving into yarn. The carriage extends over the whole width of the machine and moves slowly toward and away from the head stock during the spinning operation.
- s) “Nip” is the danger zone between two rolls or drums which by virtue of their positioning and movement create a nipping hazard.
- t) “Openers and Pickers” means a general classification of machinery which includes breaker pickers, intermediate pickers, finisher pickers, single process pickers, multiple process pickers, willow machines, card and picker waste cleaners, thread extractors, shredding machines, roving waste openers, shoddy pickers, bale breakers, feeders, vertical openers, lattice cleaners, horizontal cleaners, and any similar machinery equipped with either cylinders, screen section, calendar section, rolls, or beaters used for the preparation of stock for further processing.
- u) “Paddler” means a through for a solution and two or more squeeze rolls between which cloth passes after being passed through a mordant or dye bath.
- v) “Plaiting machine” means a machine used to lay cloth into folds of regular length for convenience of subsequent process or use.
- w) “Roller printing machine” means a machine consisting of large central cylinder, or pressure bowl, around the lower part of the perimeter of which is placed a series of engraved color rollers (each having a color through), a furnisher roller, doctor blades, etc. The machine is used for printing fabrics.
- x) “Continuous bleaching range” means a machine for bleaching of cloth in rope or open-width form with the following arrangement. The cloth, after wetting out, pass through a squeeze roll into a saturator containing a solution of caustic soda and then to and enclosed J-Box. A V-shaped arrangement is attached to the front part of the J. Box for uniform and rapid saturation of the cloth with steam before it is packed down in the J-Box. The cloth, in a single strand rope form, passes over a guide roll down the first arm of the “V” and up the second. Steam is injected into the “V” at the upper end of the second arm so that the cloth is rapidly saturated with steam, at this point. The J-Box capacity is such that cloth will remain hot for a sufficient time to complete the scouring action. It then passes series of washers with a squeeze roll in between. The cloth then passes through a second set of saturator, J-Box and washer, where it is treated with the peroxide solution. By slight modification of the form of the unit, the same process can be applied to open-width cloth.
- y) “Mercerizing range” means a 3-bowl mangle, a tenter frame, and a number of boxes for washing a scouring. The whole set up is in a straight line and all parts operate continuously. The combination is used to saturate the cloth with sodium hydroxide, stretch it while saturated, and washing out most of the caustic before releasing tension.
- z) “Sanforizing machine” means a machine consisting of a large steam-heated cylinder, and endless, thick, wollen felt blanket which is in close contact with the cylinder for most of its perimeter, and an electrically heated shoe which presses the cloth against the blanket while the latter is in a stretched condition as it curves around feed-in roll.

- aa) “Shearing machine” means a machine used for shearing cloth. Cutting action is provided by a number of steel blades spirally mounted on a roller. The roller rotates in close contact with a fixed ledger blade. There may be from one to six such rollers on a machine.
- bb) “Singeing machine” means a machine which comprises of a heated roller, plate, or an open gas flame. The cloth or yarn is rapidly passed over the roller or the plate or through the open gas flame to remove fuzz or hairiness by burning.
- cc) “Slasher” means a machine used for applying a size mixture to wrap yarns. Essentially, it consists of a stand for holding section beams, a size box, one or more cylindrical dryers or an enclosed hot air dryer, and a beaming end for winding the yarn on the loom beams.
- dd) “Tenter frame” means a machine for drying cloth under tension. It essentially consists of a pair of endless traveling chains fitted with clips of fine pins and carried on tracks. The cloth is firmly held at the salvages by the two chains which diverge as they move forward so that the cloth is brought to the desired width.
- ee) “Warper” means a machine for preparing and arranging the yarns intended for the warp of a fabric, specifically, a beam warper.

3. General safety requirements.

- 1) Every textile machine shall be provided with individual mechanical or electrical means for starting and stopping such machines. Belt shifter on machines driven by belts and shafting should be provided with a belt shifter lock of an equivalent positive locking device.
- 2) Stopping and starting handles or other controls shall be of such design and so positioned as to prevent the operator’s hand or fingers from striking against any moving part of any other part of the machine.
- 3) All belts, pulleys, gears, chains, sprocket wheels, and other dangerous moving parts of machinery which either form part of the machinery or are used in association with it, shall be securely guarded.

4. Openers and pickers.

- 1) In all opening or picker machinery, beaters and other dangerous parts shall be securely fenced to suitable guards so as to prevent contact with them. Such guards and doors or covers or openings giving access to any dangerous part of the machinery shall be provided with interlocking arrangement.
Provided that in the case of doors or covers of openings giving access to any dangerous part, other than beater covers, instead of the interlocking arrangement, such openings may be so fenced by guards which prevent access to any such dangerous part and which is either kept positively locked in position or fixed in such a manner that it cannot be removed without the use of hand tools.
- 2) The feed rolls on all opening and picking machinery shall be covered with a guard designed to prevent the operator from reaching the nip while the machinery is in operation.
- 3) The lap forming rollers shall be fitted with a guard or cover which shall prevent access to the nip at the intake of the lap roller and fluted roller as long as the weighted rack is down. The Guard or cover shall be so locked that it cannot be raised until the machine is stopped, and the machine cannot be started until the cover or guard is closed.

Provided that the foregoing provision shall not apply to the machines equipped with automatic lap forming devices.

Provided further any such machine equipped with an automatic lap forming device shall not be used unless the automatic lap forming device is in efficient working order.

5. Cotton cards.

- 1) All cylinder doors shall be secured by interlocking arrangement which shall prevent the door being opened until the cylinder has ceased to revolve and shall render it impossible to restart the machine until the door has been closed.

Provided that the latter requirement in respect of the automatic locking device shall not apply while stripping or grinding operations are carried out;

Provided further that stripping or grinding operations shall be carried out only by specially trained adult workers wearing tight fitting clothing whose names have been recorded in the register in Form 12 prescribed in this behalf as required in subsection (1) of section 22.

- 2) The lick-in shall be guarded so as to prevent access to the dangerous parts.
- 3) Every card shall be equipped with an arrangement that would enable the card cylinder to be driven by power during stripping/grinding operations without having to either shift the main belt to the fast pulley of the machine or to dismantle the interlocking mechanism. Such an arrangement shall be used only for stripping or grinding operations.

6. Garnett machines.

- 1) Garnett lick-in shall be enclosed.
- 2) Garnett fancy rolls shall be enclosed by guards. Those shall be installed in a way that keeps worker rolls reasonably accessible for removal or adjustment.
- 3) The underside of the garnett shall be guarded by a screen mesh or other form of enclosures to prevent access.

7. Gill boxes.

- 1) The feed end shall be guarded so as to prevent fingers being caught in the pins of the intersecting fallers.
- 2) All nips of in-running rolls shall be guarded by suitable nip guards conforming to the following specifications:-

Any opening which the guard may permit when fitted in position shall be so restricted with respect to the distance of the opening from any nip point through that opening and in any circumstances the maximum width of the opening shall not exceed the following:

<u>Distance of opening from nip point</u>	<u>Maximum width of opening</u>
0 to 30 mm	6 mm
39 to 63 mm	10 mm
64 to 88 mm	13 mm
89 to 140 mm	15 mm
141 to 165 mm	19 mm
166 to 190 mm	22 mm
191 to 215 mm	32 mm

8. Silver and ribbon lappers (cotton).

The calendar drums and the lap spool shall be provided with a guard to prevent access to the nip between the in-running rolls.

9. Speed frames.
Jack box wheels at the head stock shall be guarded and the guard shall have interlocking arrangement.
10. Spinning mules.
Wheels on spinning mule carriages shall be provided with substantial wheel guards, extending to within 6 mm of the rails.
11. Warpers. Swiveled double-bar gates shall be installed on all warpers operating in excess of 410 meters/min. These gates shall have interlocking arrangement, except for the purpose of inching or jogging.
Provided that the top and bottom bars of the gate shall be at least 1.05 and 0.53 meters high from the floor or working platform, and the gate shall be located 38 mm from the vertical tangement to the beam head.
12. Slashers.
 - 1) Cylinder dryers.
 - a) All open nips of in-running rolls shall be guarded by nip guards conforming to the requirements in paragraph 7.
 - b) When slashers are operated by control levers, these levers, shall be connected to a horizontal bar or treadle located not more than 170 cm. above the floor to control the operation from any point.
 - c) Slashers operated by push-button control shall have stop and start buttons located at each end of the machine and additional stop and start buttons located on both sides of the machines at intervals spaced not more than 1.83 meters on centers.
13. Looms.
 - 1) Each loom shall be equipped with suitable guards designed to minimize the danger from flying shuttles.
 - 2) Beam weights for tension in beam shall be of such construction so as to prevent it falling during its adjustment.
14. Valves of kiers, tanks, and other containers.
 - 1) Each valve controlling the flow of steam, injurious gases or liquids into a kier or any other tank or container into which a person is likely to enter in connection with a process, operation, maintenance or for any other purpose, shall be provided with a suitable locking arrangement to enable the said person to lock the valve securely in the closed position and retain the key with him before entering the kier, tank or container.
 - 2) Wherever boiling tanks, caustic tanks and any other containers from which liquids which are hot, corrosive or toxic may overflow or splash, are so located that the operator cannot see the contents from the floor or working area emergency shut off valves which can be controlled from a point not subject to danger of splash shall be provided to prevent danger.
15. Shearing machines: All revolving blades on shearing machines shall be guarded so that the opening between the cloth surface and the bottom of the guard will not exceed 10 mm.
16. Continuous bleaching range (cotton and rayon). The nip of all in-running rolls on open-width bleaching machine rolls shall be protected with a guard to prevent the worker from being caught at the nip. The guard shall extend across the entire length of the nip.
17. Mercerizing range (piece goods).
 - 1) A stopping device shall be provided at each end of the machine.
 - 2) A guard shall be provided at each end of the frame between the in-running chain and the clip opener.

- 3) A nip guard shall be provided for the in-running rolls of the mangle and washers and the guard shall conform to the requirements in paragraph 7 (2).
18. Tender frames.
- 1) A stopping device shall be provided at each end of the machine.
 - 2) A guard shall be provided at each end of the machine frame at the in-running chain and clip opener.
19. Paddlers. Suitable nip guards conforming to the requirement in paragraph 7(2) shall be provided to all dangerous in-running rolls.
20. Centrifugal extractors.
- 1) Each extractor shall be provided with a guard for the basket, and the guard shall have inter-locking arrangement.
 - 2) Each extractor shall be equipped with a mechanically or electrically operated brake to quickly stop the basket when the power driving the basket is shut off.
21. Squeezer or wringer extractor, water mangle, strach mangle, back washer (worsted yarn), crabbing machines and decating machine-All in-running rolls shall be guarded with nip guards conforming to the requirements in paragraph 7(2).
22. Sanforizing and palmer machine.
- 1) Nip guards shall be provided on all accessible in-running rolls and these shall conform to the requirements in paragraph 7(2).
 - 2) Access from the sides to the nips of in-running rolls should be fenced by suitable side guards.
 - 3) A safety trip rod, cable or wire center cord shall be provided across the front and back of all palmer cylinders extending the length of the face of the cylinder. It shall operate readily whether pushed or pulled. The safety trip shall not be more than 170 cm above the level at which the operator stands and shall be readily accessible.
23. Rope washers.
- 1) Splash guards shall be installed on all rope washers unless the machine is so designed as to prevent the water or liquid from splashing the operator, the floor, or working surface.
 - 2) A safety trip rod, cable or wire centre cord shall be provided across the front and back of all rope washers extending the length of the face of the washer. It shall operate readily whether pushed or pulled. This safety trip shall be not more than 170 cm. above the level on which the operator stands and shall be readily accessible.
24. Laundry washer tumbler or shaker.
- 1) Each drying tumbler, each double cylinder shaker or clothes tumbler and each washing machine shall be equipped with an inter-locking arrangement which will prevent the power operation of the inside cylinder when the outer door on the case or shell is open, and which will also prevent the outer door on the case or shell from being opened without shutting off the power and the cylinder coming to a stop. This should not prevent the movement of the inner cylinder by means of a hand operated mechanism or an inching device.
 - 2) Each closed barrel shall also be equipped with adequate means for holding open doors or covers of the inner and outer cylinders of shells while it is being loaded or unloaded.

25. Printing machine (roller type).
 - 1) All in-running rolls shall be guarded by nip guards conforming to the requirement in paragraph 7(2).
 - 2) The engraved roller gears and the large crown wheel shall be guarded.
26. Calenders. The nip at the in-running side of the rolls shall be provided with a guard extending across the entire length of the nip and arranged to prevent the fingers of the workers from being pulled in between the rolls or between the guard and the rolls, and so constructed that the cloth can be fed into the rolls safely.
27. Rotary staple cutters. The cutter shall be protected by a guard to prevent hands reaching the cutting zone.
28. Plaiting machines. Access to the trap between the knife and card bar shall be prevented by a guard.
29. Hand baling machine. An angle iron handle-stop guard shall be installed at right angle to the frame of the machine. The stop guard shall be so designed and so located that it will prevent the handle from traveling beyond the vertical position should the handle slip from the operator's hand when the pawl has been released from the teeth of the take-up gear.
30. Flat-work ironer. Each flat-work or collar ironer shall be equipped with a safety bar or other guard across the entire front of the feed or first pressure rolls so arranged that the striking of the bar or guard by the hand of the operator or other person will stop the machine. The guard shall be such that the operator or other person cannot reach into the rolls without removing the guard. This may be either a vertical guard on all sides or a complete cover. If a vertical guard is used, the distance from the floor or working platform to the top of guard shall be not less than 1.83 meters.

Schedule – II

JUTE MILL

1. Fencing of Machinery.
Fencings, guards or safety devices in respect of each individual machine as prescribed shall be provided and maintained in good order.
2. Softening Machine.
 - a) A safety stopping device comprising or a breast plate in front of the feed table shall be provided to operate the belt striking gear by releasing an unbalanced weight.
No device departing from the unbalanced weight principle will be deemed to conform to this rule unless it has been approved in writing by the inspector. In the case of machines provided with an individual electric drive the device shall be arranged to act on a switch inserted in the no-volt release circuit.
 - b) The feed table shall not be less than 1.83 meters in length, measured from the centre of the first cloth roller to the centre of the first pair of cast iron rollers. The table shall be provided with side guards reaching a height of not less than 1.37 meters from the floor, and extending at that height, not less than 1.07 meters from the centre of the first pair of rollers; the height of the rest of the side guards shall not be less than 1.22 meters from the floor.
 - c) The starting and stopping gear shall be arranged to comply with the following :-
 - i) Provision for stopping the machine at both the feed and delivery ends.

- ii) Provision for starting the machine at the feed end only, the design shall be such that an operator at the feed and cannot start the machine without the co-operation of an operator at the delivery end.
- iii) When a machine is stopped for clearing a jam or attention otherwise, the starting gear shall be secured in the "Off" position at least by a lock operated by a removable key in possession of the person attending the machine.
- iv) The lever operating the unbalanced weight shall be securely fenced.
- d) Sheet steel casings completely enclosing the side shafts, i.e. , the shafts and gears shall not be exposed on the underside. The casings shall be locked or secured by a device which will ensure i) that they cannot be opened while the machine is in motion and ii) that it will not be possible to start the machine unless they are closed.

3. Carding machines:

- a) The underframe shall be guarded in such a manner that it will not be possible for operators to obtain access underneath the machine until the cylinder has ceased to revolve. The lowest cross member of the frame shall come down to point not more than 25.4 cm from the floor and all openings above this, large enough to permit of access underneath, shall be filled in with sheet steel or fitted with bars or rods spaced not more than 15.24 cm apart, any part of this controlled by a device which will ensure they can not be opened until the cylinder has come to rest and that the machine cannot be restarted until the doors are closed :
Provided that in the case of machines installed before 1st January 1950, rigidly secured panels filling the under-frame will be deemed to comply with it.
- b) A guard with panels and sliding doors of sheet steel or closely spaced bars or rods enclosing the side gears; there shall be no opening at the underside of this protection for access to the gears. The sliding doors shall be controlled by a device which will ensure that they cannot be opened until the cylinder has come to rest, and that the machine cannot be started up until the doors are closed.
- c) A sheet steel guard extending upto the centre line of the cylinder, enclosing the stripper belts and pulleys shall be provided on all machines installed after 1st January, 1950.
- d) An adequately strong and rigid set of bars or rods over the doffer roller, shall be securely bolted in position. This guard must follow the radius of the roller; the space between the rods not to exceed 5.08 cm; the distance from the doffer pin points to the underside of the rods to be 10.16 cm; the space between the drawing pressing roller and the first rod not to exceed 5.08 cm; and the width of the guard from the first to the last rod to be not less than 30.5 cm.
- e) A hard or guard rail extending the full width of the Drawing pressing roller, fitted in a convenient position in front of and higher than the roller.
- f) Effective side guards to prevent operator's fingers being caught between the delivery roller and the pressing ball.
- g) When a machine is stopped for clearing a jam or attention otherwise, the starting gear shall be secured in the "Off" position atleast by a lock operated by a removable key in possession of the person attending the machine.

4. Drawing machine.

- a) A sheet steel guard completely closing the space between the bend rail and the bottom of the retaining roller, the opening and closing of which shall be controlled by the starting gear, and the design such that the guard cannot be opened while the machine is running. The guard plate shall swivel more or less about the centre of its height, and the top edge shall swing inwards towards the gill bars as guard opens, and outwards as the guard closes :

Provided further that in the case of machines with individual electric drive it will be sufficient if the guard is of the swiveling type and interlinked with the driving mechanism so that silver cannot be fed into the gills, or the guard opened, before the machine is stopped , and that the machine cannot be started up unless the guard is closed.

- b) Sheet steel or cast iron guards completely enclosing the end gears, the design to be such that access to the gears is possible only by removing the guard in its entirety. If doors or movable panels are provided they shall be controlled by a locking device, operated by the starting gear, which will ensure that the machine cannot be started unless the guard is completely closed and that no movable part cannot be opened whilst the machine is in motion;

Provided that in the case of machines installed before 1st Jan., 1950, a guard securely held in position by automatic catches to prevent opening by vibration but without the interlocking arrangement will be deemed to comply with it.

- c) An efficient guard shall be provided which will prevent operator fingers or hands being caught between the delivery roller and the pressing ball.
- d) Starting and stopping gear so designed that the machine can be stopped by operatives on the feed and delivery sides; can be started only by an operative on the feed side but with the cooperation of the operative on the delivery side and cannot be started by an operative on the delivery side. The device necessitating cooperation shall be engaged before the machine stops.
- e) Shear pins driving the individual carriages shall be fitted to the pinion on the main back shaft and not to the pinion on the carriage back shaft.

5. Roving machine.

- a) Starting and stopping gear shall be designed to embody the following :
 - i) Provision for stopping the machine on both the feed and delivery side.
 - ii) Provision for starting the machine on the delivery side only.
 - iii) A device on the delivery side which will automatically lock the belt striking gear in the "Off" position. This device shall be such that the machine will not stop before the lock is engaged nor start before it is disengaged by a worker on the delivery side.
- b) Sheet steel or cast iron guards completely enclosing the end gears, the design to be such that access to the gears is possible only by removing the guard in its entirety. If doors or movable panels are provided, they shall be controlled by a locking device, operated by the starting gear, which will ensure that the machine cannot be started unless the guard is completely closed and that no movable part can be opened whilst the machine is in motion :

Provided that in the case of machines installed before 1st Jan., 1950, a guard securely held in position by automatic catches to prevent opening by

vibration, but without the interlocking arrangement will be deemed to comply with it.

- c) Shear pins driving individual carriages shall be fitted to the pinion on the main back shaft and not to the pinion on the carriage back shaft.

6. Spinning frames.

- a) Access between the driving cylinders whilst in motion shall be prevented by providing a door at the pass end, so interconnected with the starting gear that neither side of the frame can be set in motion whilst the door is open and conversely the door cannot be opened whilst either or both sides of the frame is or are running.

Provided that in the case of machines installed before 1st Jan., 1950, hinged and will secured doors will be deemed to comply with it.

- b) Sheet steel or cast iron guards completely enclosing the end gear, the design to be such that access to the gears is possible only by removing the guard in its entirety; If doors or movable panels are provided they shall be controlled by a locking device, operated by the starting gear, which will ensure that the machine cannot be started unless the guard is completely closed and that no movable part can be open whilst the machine is in motion :

Provided that in the case of machine installed before 1st Jan., 1950, a guard securely held in position by automatic catches to prevent opening by vibration but without the interlocking arrangement will be deemed to comply with it.

7. Cop Winding machines :

- a) Effective guards covering the driving end gears. Hinged doors or panels will not be deemed to comply with this rule unless securely held in the closed position by automatic catches to prevent opening by vibration.
- b) Guards covering the spindle driving gears of such designs that it will not be possible to remove them from position whilst the machine is in motion :Provided that in the case of machines installed before 1st Jan., 1950, guards rigidly secured by bolts or screws will be deemed to comply with it.

8. Roll winding machines :

Effective guards for traverse or other gears and cams. Hinged doors or panels will not be deemed to comply with this rule unless securely held in the closed position by automatic catches to prevent opening by vibration.

9. Beaming machines :

- a) The flywheel shall be of the disc type.
- b) Cross and side shafts driving the starch rollers shall be enclosed in protecting tubes.
- c) A guard securely anchored in position and protecting the nip between the top and bottom starch rollers. It shall have an aperture large enough to pass the yarn through but not the operator's hand. A hinged guard will not be deemed to be compliance with this rule.
- d) A guard protecting the nip between the yarn beam pressing roller and the outer top weight roller, i.e. the top weight roller on the side at which the beam is inserted and removed.
- e) The space between an yarn guide roller and its adjacent steam cylinder must be not less than 7.62 cm.

10. Looms :

- a) Sheet steel or cast iron for guards protecting the crank and wiper shaft spur gears shall be provided.

- b) The minimum clearance between the sley and breast beam shall be not less than 5.08 cm.
 - c) Yarn beams shall be placed on looms by mechanical or other means. Lifting into position by hand alone will not be deemed to comply with this rule.
- 11. Cropping machines :
Sheet steel guards protecting the spirals shall be provided.
- 12. Calendaring machines :
 - a) A strong and rigid guard securely fixed in position, in front of the nip between the bottom cast iron roller and the paper roller on top of same. This guard shall be constructed in such a manner that it will be impossible for the fingers of an operator to reach the nip through the aperture in the guard.
 - b) Safety rollers protecting the nip of the upper rollers :
These rollers must be made of steel or wrought iron tube, as light as possible and not more than 6.35 cm in external diameter. The safety roller shall ride on the under roller and be free to lift. It shall be set in such a manner that the peripheral clearance between it and the upper roller, and between it and the under roller when the safety roller is fully raised, will not permit of an operator's fingers reaching the nip.
 - c) Sheet steel panels shall be fitted on the machine gable to prevent access through same to the large wheel.
 - d) Lever weights shall be lowered into strong and rigid guards.
- 13. Cloth cutting machines:
A guard preventing access to the knife from the front, top or sides shall be provided. On the underside the knife shall be protected up to the maximum limit without interfering with the machine operation.
- 14. Lapping machines :
 - a) Provision for starting the machine at the feed end only : the design shall be such that an operator at the feed end cannot start the machine without the co-operation of an operator at the delivery end and that he cannot interfere with the device necessitating co-operation.
 - b) A "sight panel" fitted to the feed table in such position that operators on either side of the machine can see through to the other side.
 - c) The hand wheel on the driving shaft shall be of the disc type and it shall be located at sufficient distance from the machine gable to permit of fencing being constructed between it and the lever mechanism operating the folder.
 - d) The treadle mechanism shall be such as to allow extraction of the maximum cloth lapped and no worker shall be required to go up on the machine table to force it down.
- 15. Sewing machines:
An apron plate shall be fitted in front of the feed chain and the plate shall be without holes or openings except for slots for the jocky pulleys.
- 16. Press pits :
When the press table is level with the floor the clearance between it and the floor shall not be less than 10.16 cm.

Schedule III

Cotton Ginning Machinery

1. The line shaft or second motion in cotton ginning factories when below floor level, shall be completely enclosed by a continuous wall or unclimbable fencing with only so many openings as are necessary for access to the shaft for removing

- cotton seed, cleaning and oiling, and such openings shall be provided with gates or doors, which shall be kept closed and locked.
2. The bars portions of the line shaft between the bearings and also of the projection at the ends of the line shaft shall be provided with adequate inverted “U” or sleeve type of guards of substantial construction.

Schedule IV

Wood Working Machinery

1. Definitions.- For the purposes of this schedule-
 - a) “Wood working machine” means a circular saw, band saw, planning machine, chain mortising machine or vertical spindle moulding machine operating on wood or cork :
 - b) “Circular saw” means a circular saw working in a bench (including a rack bench), but does not include a pendulum or similar saw which is moved towards the wood for the purpose of cutting operations :
 - c) “band saw” means a band saw, the cutting portion of which runs in a vertical direction but does not include a log saw or band re-sawing machine; and
 - d) “Planning machine” means a machine for overhand planning or for thicknessing or for both operations.
2. Stopping and starting device. – An efficient stopping and starting device shall be provided on every woodworking machine. The control of this device shall be in such a position as to be readily and conveniently operated by the person in charge of the machine. For every electrical motor driven woodworking machine, “on and off” position in respect of every switch shall be marked prominently. The starting switches and devices shall be so guarded as to prevent accidental and inadvertent starting of the machine.
3. Space around machine. - The space surrounding every woodworking machine in motion shall be kept free from obstruction. There should be ample space around each machines to enable the operator to handle pieces of timber without interfering with other machines. Sufficient room for stacking of material and passages for movement of persons to be adequate. Accumulation of scrap and shavings should be avoided to eliminate fire hazard. Finished and un-finished timber should be piled safely and neatly and attention to good house keeping should be given.
4. Floors. – The floor surrounding every woodworking machine shall be maintained in good and level condition and shall not be allowed to become slippery and as far as practicable shall be kept free from chips or other loose materials.
5. Lighting. – The machine should be located in relation to natural and artificial lighting so that the point of operation is adequately illuminated. Reflected glare and shadows shall be avoided.
6. Earth Connection. – The metal frame work of all machines having electric motors attached to them shall be effectively electrically grounded which shall be maintained in good condition.
7. Working surfaces. – The working surfaces of all machines shall be of a height which would contribute a minimum of fatigue for the operator and shall provide for easiness of operation. If necessary, a substantial platform securely fastened to the floor and of compensating height be provided, if the operator is of less than average stature and the working table can not be lowered to adjust. The height of auxiliary tables and supports should also be the same height as of the machine as far as practicable. Recommended average height from working floor to working surfaces are 36”for hand feed circular saws, 32” for power feed circular saws, 42”

- for band saws, and 36" for shaper and jointers. The working surface shall be kept entirely free from chips, scraps and wastes.
8. Exhaust system. – Local exhaust system shall be provided for removal of saw dust and chips at the source.
 9. Stacking and Storing of Materials. – Finished, semi-finished, un-finished materials in a wood-working factory shall be neatly arranged and safely stacked providing enough space for free movement of men and materials.
 10. Protective cloth. – Mistress, operators and helpers should wear tight fitting clothes. Aprons of heavy leather or other suitable materials will be provided to all workers. Suitable caps or head covers, safety spectacles, gloves, mittens shall be provided to the workers. The workers shall be supplied with masks.
 11. Mechanical feeding. – Mechanical feeding devices shall be adopted in preference to manual feeding wherever possible. In case of any controversy regarding possibility of adopting mechanical feeding devices, the matter shall be referred to the Chief Inspector whose decision in this regard shall be final.
 12. Circular saws. – Every circular saw shall be fenced as follows :
 - a) behind and in direct line with the saw there shall be a riving knife, which shall have a smooth surface, shall be strong, rigid and easily adjustable, and shall also conform to the following conditions :-
 - i) the edge of the knife nearer the saw shall form an arc of a circular having a radius not exceeding the radius of the largest saw used on the bench :
 - ii) the knife shall be maintained as close as practicable to the saw, having regard to the nature of the work being done at the time, and at the level of the bench table the distance between the front edge of the knife and the teeth of the saw shall not exceed 12 millimeters :
 - iii) for a saw of a diameter of less than 60 centimeters, the knife shall extend upwards from the bench table to within 25 millimeters of the top of the saw, and for a saw of a diameter 60 centimeters or over shall extend upwards from the bench table to a height of at least 23 centimeters :
 - b) the top of the saw shall be covered by a strong and easily adjustable guard, with a flange at the side of the saw farthest from the fence. The guard shall be kept so adjusted that the said flange shall extend below the roots of the teeth of the saw. The guard shall extend from the top of the riving knife to a point as low as practicable at the cutting edge of the saw : and
 - c) the part of the saw below the bench table shall be protected by two plates of metal or other suitable material, one on each side of the saw; such plates shall not be more than 15 centimeters apart, and shall extend from the axis of the saw outwards to a distance of not less than 5 centimeters beyond the teeth of the saw. Metal plates, if not beaded, shall be of a thickness of at least 2.5 millimeters, or, if beaded, be of a thickness of at least 1.25 millimeters.
 - d) Hood or Crown Guard. – The crown of the saw shall be covered by an adjustable hood with an inverted 'U' or 'L' section of adequate strength. The material of the guard will not shatter if cutter is broken, be non-explosive and not more flammable than wood.
 13. Push sticks. – A push stick or other suitable appliance shall be provided for use at every circular saw and at every vertical spindle moulding machine to enable the work to be done without unnecessary risk.
 14. Band saws. – Every band saw shall be guarded as follows :

- a) both sides of the bottom pulley shall be completely encased by sheet or expanded metal or other suitable material;
 - b) the front of the top pulley shall be covered with sheet or expanded metal or other suitable material; and
 - c) all sides of the blade shall be enclosed or otherwise securely guarded, except the portion of the blade between the bench table and the top guide.
15. Planning machines. –
- 1) A planning machine (other than a planning machine which is mechanically fed) shall not be used for overhead planning unless it is fitted with a cylindrical cutter block.
 - 2) Every planning machine used for overhand planning shall be provided with a “bridge” guard capable of covering the full length and breadth of the cutting slot in the bench, and so constructed as to be easily adjusted both in a vertical and horizontal direction.
 - 3) The feed roller of every planning machine used for thicknessing, except the combined machine for overhead planning and thicknessing, shall be provided with an efficient guard.
16. Vertical spindle moulding machines :
- 1) The cutter of every vertical spindle moulding machine shall be guarded by the most efficient guard having regard to the nature of the work being performed.
 - 2) The wood being moulded at a vertical spindle moulding machine shall, if practicable, be held in a jig or holder of such construction as to reduce as far as possible the risk of accident to the worker.
17. Chain mortising machines. – The chain of every chain mortising machine shall be provided with a guard which shall enclose the cutters as far as practicable.
18. Adjustment and maintenance of guards. – The guards and other appliances required under this schedule shall be :
- a) maintained in an efficient state;
 - b) constantly kept in position while the machinery is in motion;
 - c) so adjusted as to enable the work to be done without unnecessary risk, and
 - d) Cutters shall be well balanced to avoid creation of unbalanced centrifugal forces. They shall be through and straight and shall be sharp at all times.
19. Exemptions. – Paragraphs 12, 14, 15 and 16 shall not apply to any woodworking machine in respect of which it can be proved that other safeguards are provided, maintained and used which render the machine as safe as it would be if guarded in the manner prescribed in this schedule.

Schedule V

Rubber Mills and Plastic Mills

1. Definition –
- i) A “Rubber Mill” shall mean machine with rollers used in breaking down, cracking, washing, grating, mixing, refining and warming of rubber or rubber goods.
A “Plastic Mill” shall mean machine with rollers used in breaking down, cracking, washing, grating, mixing, refining and warming of plastic or plastic goods.
 - ii) A “Calendar” shall mean machine with rolls used for fractioning, sheeting, coating and breading of rubber compounds and plastic or plastic compounds.

2. Installation of machine: Rubber and plastic mills shall be so installed that the top of the front roll is not less than 100 cm above the floor or working level;
3. Safety devices –
 - 1) Rubber and plastic mills shall be equipped with;
 - a) hoppers so constructed or guarded that it is impossible for the operators to come into contact in any manner with the nip of the rolls; or
 - b) horizontal safety-trip rods or tight wire cables across both front and rear, which will, when pushed or pulled, operate instantly to disconnect the power and apply the brakes, or to reverse the rolls.
 - c) Safety-trip rods or tight wire cables on rubber mills shall extend across the entire length of the face of the rolls and shall be located not more than 170 cm above the floor or working level.
 - 2) Calendar machines shall be equipped with
 - a) Horizontal safety-trip or tight wire across both front and rear, which will when pushed or pulled operate instantly disconnect the power and apply the brakes or to reverse the roll;
 - b) Safety-trip rods or tight wire cables on calendar machines shall extend across the entire length of the face of the roll and shall be located not more than 170 cms above the floor or working level;
 - c) on each side of all calendars and near both ends of the face of the rolls there shall be a vertical tight wire cable connecting with the bar tripping mechanism at the top and fastened to the frame within 30 cm of the floor. These cables should be positioned at a distance of not more than 30 cm from the face of the roll and a distance of not less than 25 mm from the calendar frame.
3. Maintenance and safety devices. – Safety trip rods and tight wire cables on all rubber mills and calendars shall be examined and tested daily in the presence of the Manager or other responsible person and if any defect is disclosed by such examination and test, the mill shall not be used until such defect has been remedied.
4. Injection Moulding Machine. –
 - a) An electrical interlock arrangement shall be provided so that the moulds cannot be closed unless the front safety gate is fully closed and on opening the front safety gate is fully closed and on opening the front safety gate, the moulds will stop automatically.
 - b) In addition to the above arrangement an hydraulic safety shall also be incorporated with the front safety gate. This shall prevent the tail stock mould plate from moving forward on opening of the front safety gate.
 - c) At the rear of the machine, there shall be provided either an efficient fixed guard or a sliding gate which shall be electrically inter-locked with the movement of the mould plates in the manner of the front safety gate as required under a) above so as to prevent access to the danger zone of the moulds in motion from the rear.

Schedule VI

Centrifugal Machines

1. Definition. –
“Centrifugal machines” include centrifugal extractors, separators and driers.
2. Every part of centrifugal machine shall be –
 - a) of good design and construction and of adequate strength;

- b) properly maintained; and
 - c) examined thoroughly by a competent person at regular intervals.
- 3. Interlocking guard for drum or basket. –
 - 1) The cage housing the rotating drum or basket of every Centrifugal machine shall be provided with a strong lid. The design and construction of the cage as well as the lid should be such that no access is possible to the drum or basket when the lid is closed.
 - 2) Every centrifugal machine shall be provided with an efficient interlocking device that will effectively prevent the lid referred to in sub-paragraph (i) from being opened while the drum or basket is in motion and prevent the drum or basket being set in motion while the lid is in the open position.
- 4. Braking arrangement. –
Every centrifugal machine shall be provided with an effective braking arrangement capable of bringing the drum or basket to rest within as short a period of time as reasonably practicable after the power is cut off.
- 5. Operating speed. – No centrifugal machine shall be operated at a speed in excess of the manufacturer's rating which shall be legibly stamped at easily visible places both on the inside of the basket and on the outside of the machine casing.
- 6. Exceptions. – Sub-paragraph (2) of paragraph 3, paragraphs 4 and 5 shall not apply in case of top lung machines or similar machines used in the sugar manufacturing industry.

Schedule VII

Power press

- 1. Application:- The schedule shall apply to all types of power presses including press brakes, except when used for working on hot metal.
- 2. Definition:- For the purpose of this Schedule –
 - a) “approved” means approved by the Chief Inspector:-
 - b) “fixed fencing” means fencing provided for the tools of a power press being fencing which has no moving part associated with or dependent upon the mechanism of a power and includes that part of a closed tool which acts as a guard;
 - c) “Power press” means a machine used in metal or other industries for moulding, pressing, blanking raising drawing and similar purposes;
 - d) “Safety device” means the fencing and any other safeguard provided for the tools of a power press.
- 3. Starting and stopping mechanism:-
The starting and stopping mechanism shall be provided with a safety stop so as to prevent over running of the press or descent of the ram during tool setting, etc.
- 4. Protection of tool and die:-
 - 1) Each press shall be provided with a fixed guard with a slip plate on the underside enclosing the front and all sides of the tool.
 - 2) Each die shall be provided with a fixed guard surrounding its front and sides, and extending to the back in the form of a tunnel through which the pressed article falls to the rear of the press.
 - 3) The design, construction and mutual position of the guards referred to in (1) and (2) shall be such as to preclude the possibility of the worker's hand or fingers reaching the danger zone.
 - 4) The machine shall be fed through a small aperture at the bottom of the die guard, but a wider aperture may be permitted for second or subsequent operations if feeding is done through a chute.

- 5) Notwithstanding anything contained in sub-clauses (1) and (2) an automatic or an inter-locked guard may be used in place of a fixed guard, but where such guards are used they shall be maintained in an efficient working condition and if any guard develops a defect, the power press shall not be operated unless the defect of the guard is removed.
5. Appointment of persons to prepare power presses for use:-
 - 1) Except as provided in sub-paragraph (4), no person shall set, re-set, adjust or try out the tools on a power press or install or adjust any safety device thereon, being installation or adjustment preparatory to production of die proving, or carry out an inspection and test of any safety device thereon required by paragraph 8 unless he-
 - a) has attained the age of eighteen;
 - b) has been trained in accordance with the sub-paragraph (2); and
 - c) has been appointed by the occupier of the factory to carry out those duties in respect of the class or description of power press or the class or description of safety device to which the power press or the safety device (as the case may be) belongs; and ; the name of every such person shall be entered in register in **Form 14**.
 - 2) The training shall include suitable and sufficient practical instruction in the matters in relation to each type of power press and safety device in respect of which it is proposed to appoint the person being trained.
6. Examination and testing of power presses and safety devices:-
 - 1) No power press or safety device shall be taken into use in any factory for the first time in that factory, or in case of a safety device for the first time on any power press, unless it has been thoroughly examined and tested in the case of power press, after installation in the factory, or in the case of a safety device, when in position on the power press in connection with which it is to be used.
 - 2) No power press shall be used unless it has been thoroughly examined and tested by a competent person within the immediately preceding period of twelve months.
 - 3) No power press shall be used unless every safety device (other than fixed fencing) thereon has within the immediately preceding period of six months when in position on that power press, been thoroughly examined and tested by a competent person.
 - 4) The competent person carrying out an examination and test under the foregoing provisions shall make a report of the examination and test containing the following particulars and every such report shall be kept readily available for inspection;
 - a) name of the occupier of the factory;
 - b) address of the factory;
 - c) identification number or mark sufficient to identify the power press or the safety device;
 - d) date on which the power press or the safety device was first taken into use in the factory;
 - e) the date of each periodical thorough examination carried out as per requirements of sub-paragraph (2) above;
 - f) Particulars of any defects effecting the safe working of the power press or the safety device found at any such thorough examination and steps taken to remedy such defects.
7. Defects disclosed during a thorough examination and tests. -

- 1) Where any defect is disclosed in any power press or in any safety device by any examination and test under paragraph 6 and in the opinion of the competent person carrying out the examination and test, either -
 - a) the said defect is a cause of danger to workers and in consequence the power press or safety device (as the case may be) ought not to be used after the expiration of a specified period unless the said defect has been remedied; such defect shall, as soon as possible after the completion of the examination and test, be notified in writing by the competent person to the occupier of the factory and, in the case of a defect falling within clause (1) of this sub-paragraph such notification shall include the period within which, in the opinion of the competent person, the defect ought to be remedied.
 - 2) In every case where notification has been given under this paragraph, a copy of the report made under paragraph 6(4) shall be sent by the competent person to the inspector for the area within 14 (fourteen) days of the completion of the examination and test.
 - 3) Where any such defect is notified to the occupier in accordance with the foregoing provisions of this paragraph the power press or safety device (as the case may be) having the said defect shall not be used -
 - a) in the case of a defect falling within clause (a) of subparagraph (1) until the said defect has been remedied; and
 - b) in the case of defect falling within clause (b) of subparagraph (1), after the expiration of the said defect has been remedied.
 - 4) As soon as is practicable after any defect of which notification has been given under sub-paragraph (1) has been remedied, a record shall be made by or on behalf of the occupier stating the measures by which and the date on which the defect was remedied.
8. Inspection and test of safety device. -
- 1) No power press shall be used after the setting, resetting or adjustment of the tools thereon unless a person appointed or authorized for the purpose under Paragraph 5 has inspected and tested every safety device thereon while it is in position on the said power press;
 Provided that an inspection, test and certificate as aforesaid shall not be required where any adjustment of the tools has not caused or resulted in any alteration to or disturbance of any safety device on the power press and if, after the adjustment of the tools, the safety devices remain, in the opinion of such a person as aforesaid, in efficient working order.
 - 2) Every power press and every safety device thereon while it is in position on the said power press shall be inspected and tested by a trained person every day.
9. Defects disclosed during an inspection and test. -
- 1) Where it appears to any person as a result of any inspection and test carried out by him under paragraph 8 that any necessary safety device is not in position or is not properly in position on a power press or that any safety device which is in position on a power press is not in his opinion suitable, he shall notify the manager forthwith.
 - 2) Except as provided in sub-paragraph (3) where any defect is disclosed in a safety device by any inspection and test under paragraph 8, the person carrying out the inspection and test shall notify the manager forthwith.
 - 3) Where any defect in a safety device is the subject of a notification in writing under paragraph 7 by virtue of which the use of the safety device may be continued during a specified period without the said defect having

been remedied, the requirement in sub-paragraph (2) of this paragraph shall not apply to the said defect until the said period has expired.

10. Identification of power presses and safety devices. – For the purpose of identification every power press and every safety device provided for the same shall be distinctively and plainly marked.
11. Training and instructions to operators. – The operators shall be trained and instructed in the safe method of work before starting work on any power press.
12. Exemption. –
 - 1) If in respect of any factory, the Chief Inspector is satisfied that owing to the circumstances or infrequency of the processes or for any other reason, all or any of the provisions of this schedule are not necessary for the protection of the workers employed on any power press or any class or description of power or in the factory, the Chief Inspector may by a certificate in writing (which he may in his discretion revoke at any time), exempt such factory from all or any of such provisions subject to such conditions, if any, as he may specify therein.
 - 2) Where such exemption is granted, a legible copy of the certificate, showing the conditions (if any) subject to which it has been granted, shall be kept posted in the factory in a position where it may be conveniently read by the persons employed.

Schedule VIII

Shears, Slitters and Guillotine Machines

1. Definition. – For the purpose of this schedule –
 - a) “guillotine” means a machine ordinarily equipped with straight, bevel-edged blade operating vertically against a stationery resisting edge and used for cutting metallic or non-metallic substances;
 - b) “shears” or “shearing machine” means a machine ordinarily equipped with straight, bevel-edged blades operating vertically against resisting edges, or with rotary, overlapping cutting wheels, and used for shearing metals or non-metallic substances;
 - c) “slitter” or “slitting machine” means a machine ordinarily equipped with circular disc-type knives, and used for trimming or cutting into metal or non-metallic substances or for slitting them into narrow strips; for the purpose of this schedule, this term includes bread or other food slicers equipped with rotary knives or cutting discs.
2. Guillotine and Shears. –
 - 1) Where practicable, a barrier metal guard of adequate strength shall be provided at the front of the knife, fastened to the machine frame and shall be so fixed as would prevent any part of the operator’s body to reach the descending blade from above, below or through the barrier guard or from the sides;
Provided that in case of machines used in the paper printing and allied industries; where a fixed barrier metal guard is not suitable on account of the height and volume of the material being fed, there shall be provided suitable starting devices which require simultaneous action of both the hands of the operator or an automatic device which will remove both the hands of the operator from the danger zone at every descent of the blade.
 - 2) At the back end of such machines, an inclined guard shall be provided over which the slit pieces would slide and be collected at a safe

distance in a manner as would prevent a person at the back from reaching the descending blade.

- 3) Power-driven guillotine cutters, except continuous feed trimmers, shall be equipped with –
 - a) starting devices which require the simultaneous action of both hands to start the cutting motion and of at least one hand on a control during the complete stroke of the knife; or
 - b) an automatic guard which will remove the hands of the operator from the danger zone at every descent of the blade, used in conjunction with one-hand starting devices which require two distinct movements of the device to start the cutting motion, and so designed as to return positively to the non starting position after each complete cycle of the knife.
- 4) Where two or more workers are employed at the same time on the same power-driven guillotine cutter equipped with two-hand control the device shall be so arranged that each worker shall be required to use both hands simultaneously on the safety trip to start the cutting motion, and at least one hand on a control to complete the cut.
- 5) Power-driven guillotine cutters, other than continuous trimmer, shall be provided, in addition to the brake or other stopping mechanism, with an emergency device which will prevent the machine from operating in the event of failure of the brake when the starting mechanism is in the non-starting position.

3. Slitting Machines :

- 1) Circular disc-type knives on machines for cutting metal and leather paper, rubber, textiles or other non-metallic substances shall, if within reach of operators standing on the floor or working level, if within reach of operators standing on the floor or working level, be provided with guards enclosing the knife edges at all times as near as practicable to the surface of the material, and which may either –
 - a) automatically adjust themselves to the thickness of the material; or
 - b) be fixed or manually adjusted so that the space between the bottom of the guard and the material will not exceed 6mm(0.25") at any time.
- 2) Portion of blades underneath the tables or benches of slitting machines shall be covered by guards.

4. Index cutters and Vertical paper Slotters :

Index cutters, and other machines for cutting strips from the ends of book, and for similar operations, shall be provided with fixed guards, so arranged that the fingers of the operators can not come between the blades and the tables.

5. Corner Cutters;

Corner cutters,. used in the manufacture of paper boxes, shall be equipped with –

- a) Suitable guard, fastened to the machines in front of the knives and provided with slots or perforations to afford visibility of the operations; or
- b) other guards equally efficient for the protection of the fingers of the workers.

6. Band knives :

Band Wheels on band knives, and all portions of the blades except the table on vertical machines, or between the sliding guide and the table on vertical machines, or between the wheel guards on horizontal machines, shall be completely enclosed with hinged guards of sheet metal not less than 1 mm (0.04") in thickness or of other material of equal strength.

Schedule IX

Agitators and Mixing Machines

1. Definition. – “Agitators and Mixing Machines” means a tank or other container equipped with power-driven mixing arms, blades or paddle wheels fixed to revolvable shafts or other simple mechanical devices for blending stirring liquids with other liquids or with solid substances or combinations of these.
2. When the top of an open agitator tank, beater tank, tank or paddle tank or a similar vessel is less than 1 M above the adjacent floor or working level, adequate standard railings shall be installed on all open sides.
3. Agitators and mixing machines shall be provided with an efficient inter-lock arrangement for the top lid, to prevent access to the agitating, stirring or similar devices, whilst in motion and would prevent restart under power with the lids in open position.
4. When other inspection or examination openings are provided at the top or sides of the containers vessels of the agitator and mixing machines, such openings shall be provided with standard grill guards as would prevent access of any part of operator’s body coming in contact with agitating, stirring or similar devices, whilst in motion inside the vessel.

Schedule X

Leather, Plastic and Rubber Stripper Machines

Strippers for trimming or punching tanned hides, plastic or rubber sheets in leather making footwear manufacturing or in similar industries shall be provided with suitable devices which require simultaneous action of both the hands of the operator or an automatic device which will remove both the hands of the operator from the danger zone at every descent of the blade, punch or stripper cutter.

Schedule XI

1. Special Rule for printing presses.
In printing works, every printing machine driven by power shall be fitted with an efficient finger guard and every guillotine machine, driven by power, with an efficient knife-guard.
2. Special rule for tea factories.
In tea factories, the roll table shall be fenced to the satisfaction of the Inspector and brushes shall be provided to the workers for the purposes of sweeping the roll table.
3. Special rule for bricks and tiles works.
In brick and tiles works, a finger-guard shall be fitted at the feed end to the full length of the mould of every revolving press.
4. Special rule for decorticating factories.
In decorticating factories, the beater arms and the feed mouth of the decorticator shall, as far as practicable, be guarded as follows:-
A grating of 19 millimeters diameter wrought iron rods spaced 64 millimeters apart and supported by iron stiffeners 5.1 centimeters by 6 millimeters thick shall be fixed at a height of 15.2 centimeters above to the tip of the beater arms. A strong wooden plank 38 millimeters thick and iron plated on the underside shall be clamped with bolts and nuts over this grating, leaving a space of 20.3 centimeters wide for the feeding of groundnuts. A grating of 2.5 centimeters diameter wrought iron rods spaced 38 millimeters apart shall be fixed at a height

- of 12.7 centimeters just above the feed mouth and another wooden plank 22.9 centimeters wide shall be fixed over the full length of the decorticator platform.
5. Special rules for factories in which polishing and grinding machinery are in use.

Safety devices:-

- a) All collars, set screws, shafts, couplings, clutches, keys and belts in polishing and grinding machinery shall be effectively guarded.
- b)
 - i) Defect wheels shall not be used.
 - ii) Grinding wheels shall fit freely on their spindles. They shall never be forced on, nor shall they be let loose on spindles.
 - iii) The soft metal bushings at the centre shall not extend beyond the sides of the wheels.
 - iv) Whenever possible, a compressible medium, such as blotting paper, rubber or similar material, at least as large in diameter as that of the flanges, shall be fitted between a wheel and each of its flanges.
 - v) Projecting arbor ends of grinding and polishing wheels shall effectively guarded.
- c) Except with the written permission of the Chief Inspector no emery or abrasive wheel shall be kept unprovided with a strong iron cover guard that shall enclose the wheel as far as practicable to retain fragments in the event of bursting. The guard shall be securely attached to the frame of the machine or other solid foundation.
- d) Where workers are employed continuously on dry grinding or polishing wheels, such wheels shall be provided with an efficient exhaust system capable of drawing off dust particles.
- e) Wheels shall not be operated at a speed in excess of that which is recommended by the manufacturer.

Schedule XII

All factories

- a) Wherever practicable and considered necessary by the Inspector, service platforms and gangways shall be provided for overhead shafting and where required by him these shall be securely fenced with guards, rails and toe boards.
- b) Safe access shall be provided to all bearing clutches, belt shifting levers and all such other appliances which are required to be handled or operated while the machinery is at work.
- c) All ladders used in replacing belts or in attending similar overhead machinery shall be specially made for that work and provided with hooks or an effective non-skid device.
- d) No transmission machinery in motion shall be cleaned with cotton waste rags or similar materials held in hand.
- e) All belts shall be regularly examined to ensure that the joints are safe and the belts are kept in proper tension.
- f) Each water gauge glass of a boiler shall be fitted with an efficient guard.
- g) All condenser pipes of steam engines and exhaust pipes of oil engines shall be adequately guarded.

Rule 68. Register of workers employed for work on or near machinery in motion:-

In every factory a register shall be maintained in Form 12 in which the name and other particulars of every such worker as may be employed for such examination or operation as referred to in the proviso to sub-section (1) of section 21 shall be entered.

Rule 69. Tight fitting clothing –

A worker required to wear tight fitting clothing under subsection (1) of section 22 shall be provided by the occupier with such clothing which shall consist of at least a pair of closely fitting shorts and a closely fitting half sleeves shirt or vest. Such clothing shall be returned to the occupier on termination of service or when new clothing is provided.

Rule 70. All Belts Etc. To Be Examined Regularly:

All belts shall be regularly examined to ensure that the joints are safe and the belts are at proper tension. The manager of the factory shall maintained a record of such examination indicating the date of examination and the person by whom examined and his opinion. This register shall be produced before the Inspector when he wants.

Rule 71. Employment of young persons on dangerous machines:

- a) Power presses other than hydraulic presses.
- b) Milling machines used in the metal trades.
- c) Shears slitters and Guillotine machines.
- d) Wood working machines.
- e) Decorticator machines.
- f) Platen printing machines.
- g) Centrifugal machines.

Rule 72. Hoists and Lifts:-

1. A register in **Form 13** shall be maintained by the manager to record the particulars of examination of hoists and lifts of a factory.
2. Examination of certain hoists and lifts:-
In pursuance of the provisions of sub-section (4) of section 28, in respect of any clase or description of hoist or lift specified in the first column of the following schedule, the requirements of section 28 specified in the second column of the said schedule and set opposite to that class or description of hoist or lift shall not apply.

SCHEDULE

Class or Description of Hoist or Lift	Requirement which shall not apply
Hoists or Lifts, mainly used for raising materials for charging blast furnace or lime kilns.	Sub-Sec 1(b) in so far as it requires a gate at the bottom landing; Sub-Sec 1(d); Sub-Sec 1(e).
Hoists not connected with mechanical power and which are not used for carrying persons.	Sub-Sec 1(b) in so far as it requires the hoistway or liftway enclosures to be so constructed as to prevent any person or thing from being trapped between any part of the hoist or lift and any fixed structure or moving part; Sub-Sec 1(e).

Rule 73. Lifting machines, chains, ropes and lifting tackles:-

1. No lifting machine and no chain, rope or lifting tackle, except a fibre rope or fibre rope sling, shall be taken into use in any factory for the first time in that factory

unless it has been tested and all parts have been thoroughly examined by a competent person and a certificate of such a test and examination specifying the safe working load or loads and signed by the person making the test and the examination, has been obtained and is kept available for inspection.

2. Every jib-crane so constructed that the safe working load may be varied by the raising or lowering of the jib, shall have attached thereto either an automatic indicator of safe working loads or an automatic jib angle indicator and a table indicating the safe working loads at corresponding inclinations of the jib or corresponding radii of the road.
3. A table showing the safe working loads of every kind and size of chain, rope or lifting tackle in use, and, in the case of a multiple sling, the safe working loads at different angles of the legs, shall be posted in the store room or place, where or in which the chains, ropes or lifting tackles are kept, and in prominent positions on the premises, and no chain, rope or lifting tackle not shown in the table shall be used:

Provided that this sub-rule shall not apply in respect of such lifting tackle of the safe working load thereof, or in the case of a multiple sling, the safe working load at different angles of the legs, is plainly marked upon it.

5. All rails on which a traveling crane moves and every tract on which the carriage of a transporter or runway moves shall be of proper size and adequate strength and have an even running surface; and every such rail or track shall be properly laid, adequately supported and properly maintained.
6. To provide access to rail tracks of overhead traveling cranes suitable passage-ways of at least 50 centimeters width with two boards and double hand rails 90 centimeters high shall be provided alongside, and clear of, the rail tracks of overhead traveling cranes, such that no moving part of the crane can strike persons on the ways, and the passage-way shall be at a lower level than the crane track itself. Safe access ladders shall be provided at suitable intervals to afford access to these passage-ways, and from passage-ways to the rail tracks.

Provided that the Chief Inspector may, for reasons to be specified in writing, exempt any factory in respect of any overhead traveling crane from the operation of any provision of this sub-rule subject to such conditions as he may specify.

7. All chains and lifting tackles except a rope sling shall, unless they have been subjected to such other heat treatment as may be approved by the Chief Inspector, be effectively annealed under the supervision of a competent person at the following intervals:
 - a) all chains, slings, rings, hooks, shackles and swivels used in connection with molten metal or molten slag or when they are made of 12.5 millimeters bar or smaller, once at least in every six months;
 - b) all other chains, slings, rings, hooks, shackles and swivels in general use, once at least in every twelve months:

Provided that chains and lifting tackle not in frequent use shall, subject to the Chief Inspector's approval, be annealed only when necessary. Particulars of such annealing shall be entered in a register prescribed under sub-rule (4) which shall be kept available for inspection.
8. Nothing in the foregoing sub-rule (7) shall apply to the following classes of chains and lifting tackles:
 - a) chains made of malleable cast iron;
 - b) plate link chains;
 - c) chains, rings, hooks, shackles and swivels made of steel or of any non-ferrous metal;
 - d) pitched chains, working on sprocket or pocketed wheels;

- e) rings, hooks, shackles and swivels permanently attached to pitched chains, pulley, blocks or weighing machines;
 - f) hooks and swivels having screw threaded parts or ball bearing or other case hardened parts;
 - g) socket shackles secured to wire ropes by white-metal capping; and
 - h) bordeaux connections;
 - i) any chain or lifting tackle which has been subjected to the heat treatment known as “Normalizing” instead of annealing.
- Provided that such chains and lifting tackles shall be thoroughly examined by a competent person once atleast in every twelve months, and particulars entered in the register kept in accordance with sub rule (4).
9. No person under 18 years of age and no person who is not sufficiently competent and reliable shall be employed as driver of a lifting machine whether driven by mechanical power or otherwise, or to give signals to a driver.
 10. All lifting machines, chains, ropes and lifting tackle except a fibre rope or fibre rope sling, which have been lengthened, altered or repaired by welding or otherwise shall, before being again taken into use, be adequately re-tested and re-examined by a competent person and a certificate of such test and examination be obtained and particulars entered in the register kept in accordance with sub-rule (4).
 11. Where the Chief Inspector is satisfied that in a factory due to shut down or for any other persons it is not practicable to maintain a minimum distance of 6 meters between the person employed or working on or near the wheel track of a traveling crane and the crane, he may on the request of the manager reduce the distance to such extent as he may consider necessary and also prescribe further precautions indicating appointment of suitable number of supervisors to ensure the safety of the persons while they ;are employed or working on or near the track.

Rule 74. Pressure vessels or plant:

1. Interpretation. – In this rule –
 - a) “pressure vessel” means a vessel that may be used for containing, storing, distributing, transferring, distilling processing or otherwise handling any gas, vapour or liquid under pressure greater than the atmospheric pressure and includes any pipeline fitting or other equipment attached thereto or used in connection therewith; and
 - b) “design pressure” means the maximum pressure that a pressure vessel or plant is designed to withstand safely when operating normally;
 - c) “maximum permissible working pressure” means the maximum pressure at which a pressure vessel or plant is permitted to be operated or used under this rule and is determined by the technical requirement of the process;
 - d) “plant” means a system of piping that is connected to a pressure vessel and is used to contain a gas vapour or liquid under pressure greater than the atmospheric pressure, and includes the pressure vessel;
 - e) “competent person” means a person who is, in the opinion of the Chief Inspector, capable by virtue of his qualification, training and experience, of conducting a thorough examination and pressure tests, as required on a pressure vessel or plant, and of making a full report on its condition.
2. Exceptions. – Nothing in this rule shall apply to –
 - a) vessels made of ferrous materials having an internal operating pressure not exceeding 1 kg per Square cm;

- b) steam boilers, steam and feed pipes and their fittings coming under the purview of Indian Boilers Act, 1923;
 - c) metal bottles or cylinders used for storage or transport of compressed gases or liquefied or dissolved gases under pressure covered by the Gas Cylinder Rules, 1981 framed under the Indian Explosives Act, 1884;
 - d) vessels in which internal pressure is due solely to the static head of liquid;
 - e) vessels with a nominal water capacity not exceeding 500 litres connected in a water-pumping system containing air that is compressed to serve as a cushion;
 - f) vessels for nuclear energy application;
 - g) refrigeration plant having a capacity of 3 tons or less or refrigeration in 24 hours; and
 - h) working cylinders of steam engines or prime movers, feed pumps and steam traps; turbine casings; compressor cylinders; steam separators or dryers; steam strainers; steam de-super-heaters; oil separators; air receivers for fire sprinkler installations; air receivers of monotype machines provided the maximum working pressure of the air receiver does not exceed 1.33 kilograms per square centimeter and the capacity 85 litres; air receivers of electrical circuit breakers; air receivers of electrical relays; air vessels on pumps pipe coils, accessories of instruments and appliances such as cylinders and piston assemblies used for operating relays and interlocking type of guards; vessels with liquids subjected to static head only; and hydraulically operating cylinders other than any cylinder communicating with an air loaded accumulator.
3. Design and construction. – Every pressure vessel or plant used in a factory-
- a) shall be properly designed on sound engineering practice;
 - b) shall be of good construction, sound material, adequate strength and free from any patent defects;
 - c) shall be properly maintained in a safe condition;
- Provided that the pressure vessel or plant in respect of the design ;and construction of which there is an Indian standard or a standard of the country of manufacture or any other law or regulation in force, shall be designed and constructed in accordance with the said standard law or regulation, as the case may be and a certificate thereof shall be obtained from the manufacturer or from the competent person which shall be kept and produced on demand by an Inspector.
4. Safety devices. – Every pressure vessel shall be fitted with.
- a) a suitable safety valve or other effective pressure relieving device of adequate capacity to ensure that the maximum permissible working pressure of the pressure vessel shall not be exceeded. It shall be set to operate at a pressure not exceeding the maximum permissible working pressure and when more than one protective device is provided, only one of the devices need be set to operate at the maximum permissible working pressure and the additional device shall be set to discharge at a pressure not more than 5 percent in excess of the maximum permissible working pressure;
 - b) a suitable pressure gauge with a dial range not less than 1.5 times the maximum permissible working pressure easily visible and designed to show at all times the correct internal pressure and marked with a prominent red mark at the maximum permissible working pressure of the pressure vessel;

- c) a suitable nipple and globe valve connected for the exclusive purpose of attaching a test pressure guage for checking the accuracy of the pressure guage referred to in clause (b) of this sub-rule;
- d) a suitable stop valve or valves by which the pressure vessel may be isolated from other pressure vessels or plant or source of supply of pressure. Such a stop valve or valves shall be located as close to the pressure vessel as possible and shall be easily accessible; and
- e) a suitable drain cock or valve at the lowest part of the pressure vessel for the discharge of the liquid or other substances that may collect in the pressure vessel;

Provided that it shall be sufficient for the purpose of this sub-rule if the safety valve or pressure relieving device, the pressure guage and the stop valve are mounted on a pipeline immediately adjacent to the pressure vessel and where there is a range of two or more similar pressure vessels served by the same pressure lead, only one set of such mountings need be fitted on the pressure lead immediately adjacent to the range of pressure vessels, provided they cannot be isolated.

5. Pressure reducing devices:

- a) Every pressure vessel which is designed for a working pressure less than the pressure at the source of supply or less than the pressure which can be obtained in the pipe connection the pressure vessel with any other source of supply, shall be fitted with a suitable pressure reducing valve or other suitable automatic device to prevent the maximum permissible working pressure of the pressure vessel being exceeded.
- b) To further protect the pressure vessel in the event of failure of the reducing valve or device, at least one safety valve having a capacity sufficient to release all the steam, vapour or gas without undue pressure rise as determined by the pressure at the source of supply and the size of the pipe connecting the source of supply, shall be fitted on the low pressure side of the reducing valve.

6. Pressure vessel or plant being taken into use:

- a) No new pressure vessel or plant shall be taken into force of this rule unless it has been hydrostatically tested by a competent person at a pressure at least 1.3 times the design pressure, and no pressure vessel or plant which has been previously used or has remained isolated or idle for a period exceeding 2 months or which has undergone alterations or repairs shall be taken into use in a factory unless it has been thoroughly examined by a competent person externally and internally, if practicable, and has been hydrostatically tested by the competent person at a pressure which shall be 1.5 times the maximum permissible working pressure ;

Provided, however, that the pressure vessel or plant which is so designed and constructed that it cannot be safely filled with water or liquid or is used in service when even some traces of water cannot be tolerated, shall be pneumatically tested at a pressure not less than the design pressure or the maximum permissible working pressure as the case may be.

Provided further that the pressure vessel or plant which is lined with glass shall be tested hydrostatically or pneumatically as required at a pressure not less than the design pressure or maximum permissible working pressure as the case may be.

Design pressure shall be not less than the maximum permissible working pressure and shall take into account the possible fluctuations of pressure during actual operation.

- b) No pressure vessel or plant shall be used in a factory unless there has been obtained from the maker of the pressure vessel or plant or from the competent person a certificate specifying the design pressure or maximum permissible working pressure thereof, and stating the nature of tests to which the pressure vessel or plant and its fittings (if any) have been subjected, and every pressure vessel or plant so used in a factory shall be marked so as to enable it to be identified as to be the pressure vessel or plant to which the certificate relates and the certificate shall be kept available for perusal by the Inspector.
 - c) No pressure vessel or plant shall be permitted to be operated or used at a pressure higher than its design pressure, or the maximum permissible working pressure as shown in the certificate.
7. In-service test and examinations:
- a) Every pressure vessel or plant in service shall be thoroughly examined by a competent person-
 - i) Externally, once in every period of six months;
 - ii) Internally, once in every period of twelve months;
 Provided that if by reason of the construction of a pressure vessel or plant, a thorough internal examination is not possible, this examination may be replaced by a hydrostatic test which shall be carried out once in every period of two years.
 Provided further that for a pressure vessel or plant in continuous process which cannot be frequently opened, the period of internal examination may be extended to four years; and
 - iii) hydrostatically tested once in every period of four years.
 Provided that in respect of a pressure vessel or plant with thin walls, such as sizing cylinder made of copper or any other nonferrous metal, periodic hydrostatic test may be dispensed with subject to the condition that the requirements laid down in sub-rule (8) are fulfilled.
 Provided further that when it is impracticable to carry out thorough external examination of any pressure vessel or plant every six months as required in sub-clause (i) of this clause, or if owing to its construction and use a pressure vessel or plant cannot be hydrostatically tested as required in sub-clause (ii) and (iii) of this clause, a thorough external examination of the pressure vessel or plant shall be carried out at least once in every period of two years, and at least once in every period of four years, a thorough systematic non-destructive test like ultrasonic test for metal thickness or other defects of all parts the failure of which might lead to eventual rupture of the pressure vessel or plant shall be carried out.
 - b) The pressure for the hydrostatic test to be carried out for the purpose of this sub-rule shall be 1.25 times the design pressure or 1.5 times the maximum permissible working pressure, whichever is less.
8. Thin walled pressure vessel or plant. –
- a) In respect of any pressure vessel or plant of thin walls such as sizing cylinder made of copper or any other non-ferrous metal, the maximum permissible working pressure shall be reduced at the rate of 5 percent of the original maximum permissible working pressure for every year of its use after the first five years and no such cylinder shall be allowed to continue to be used for more than twenty years after it was first taken into use.

- b) If any information as to the date of construction, thickness of walls, or maximum permissible working pressure is not available, the age of such pressure vessel or plant shall be determined by the competent person in consultation with the Chief Inspector from the other particulars available with the manager.
 - c) Every new and second hand pressure vessel or plant of thin walls to which repairs likely to affect its strength or safety have been carried out, shall be tested before use to at least 1.5 times its maximum permissible working pressure.
- 9. Report by competent person. –
 - a) If during any examination any doubt arises as to the ability of the pressure vessel or plant to work safely until the next prescribed examination, the competent person shall enter in the prescribed register his observations, findings and conclusions with other relevant remarks with reasons and may authorize the pressure vessel or plant to be used and kept in operation subject to a lowering of maximum permissible working pressure, or to more frequent or special examination or test, or subject to both of these conditions.
 - b) A report of every examination or test carried out shall be completed in **Form 15** and shall be signed by the person making the examination or test, and shall be kept available for perusal by the Inspector at all hours when the factory or any part thereof is working.
 - c) Where the report of any examination under this rule specified any condition for securing the safe working of any pressure vessel or plant, the pressure vessel or plant shall not be used unless the specified condition is fulfilled.
 - d) The competent person making report of any examination under this rule, shall within seven days of the completion of the examination, send to the Inspector a copy of the report in every case where the maximum permissible working pressure is reduced or the examination shows that the pressure vessel or plant or any part thereof cannot continue to be used with safety unless certain repairs are carried out or unless any other safety measure is taken.
- 10. Application of other laws. –
 - a) The requirements of this rule shall be in addition to and without any prejudice to and not in derogation of the requirements of any other law in force.
 - b) Certificate or reports of any examination, or test of any pressure vessel or plant to which sub-rules (7) to (9) do not apply, conducted or required to be conducted under any other law in force and other relevant record relating to such pressure vessel or plant, shall be properly maintained as required under the said law and shall be produced on demand by the Inspector.

Rule 75. Water-sealed gasholder:

- 1. The expression “gasholder” means a water-sealed gasholder which has a storage capacity of not less than 141.5 cubic meters.
- 2. Every gasholder shall be of adequate material and strength, sound construction and properly maintained.

3. Where there is more than one gasholder in a factory, every gasholder shall be marked in a conspicuous position with a distinguishing number or letter.
4. Every gasholder shall be thoroughly examined externally by a competent person at least once in a period of 12 months.
5. In the case of gasholder of which any lift has been in use for more than 10 years, the internal state of the sheeting shall, within one year of the coming into operation of these rules and thereafter at least once in every period of four years, be examined by a competent person by means of electronic or other accurate devices.

Provided that if the Chief Inspector is satisfied that such electronic or other accurate devices are not available, he may permit the cutting of samples from the crown and the sides of the holder.

Provided further that if the above examination raises a doubt, an internal visual examination shall be made.

6. All possible steps shall be taken to prevent or minimize ingress of impurities in the gasholder.
7. No gasholder shall be repaired or demolished except under the direct supervision of a person who, by his training experience and knowledge of the necessary precautions against risks of explosion and of persons being overcome by gas, is competent to supervise such work.
8.
 - a) All sample discs cut under sub-rule (5) above shall be kept readily available for inspection.
 - b) A permanent register in **Form 16** duly signed by the occupier or manager shall be maintained.
 - c) The result of examinations by the competent person carried out as required under sub-rules (4) and (5) shall be recorded in **Form 17**.
 - d) A copy of the report in **Form 17** shall be kept in the register in **Form 16** and both the register and the report shall be readily available for inspection.
9. The Inspector shall inspect the gasholder at least once in a period of 12 months.

Rule 76. Excessive weights:-

1. No man, woman, or young person shall unaided by another person, lift, carry or move by hand or on head any material article, tool or appliance exceeding the maximum limit in weight set out in the following schedule.

SCHEDULE

Persons.	Maximum weight of material, article, tool or appliance.
a) Adult male	50 kg.
b) Adult female	25 kg.
c) Adolescent male	20 kg.
d) Adolescent female	20 kg.
e) Male child	15 kg.
f) Female child	10 kg.

2. No man, Women young person shall engage, in conjunction with others, in lifting, carrying or moving by hand or on head any material article, tool or appliance, if the weight thereof exceeds the lowest weight fixed by the Schedule to sub-rule(1) for any of the persons engaged, multiplied by the number of the persons engaged.

Rule 77. Protection of eyes:-

Effective screens or suitable goggles shall be provided for the protection of persons employed in or in the immediate vicinity of the following processes:-

- a) The processes specified in schedule I annexed hereto, being processes which involve risk of injury to eyes from particles or fragments thrown off in the course of the processes.
- b) The processes specified in Schedule II annexed hereto, being processes which involve risk of injury to eyes by reason of exposure to excessive light or infra-red or ultraviolet radiations.

Schedule I

1. Breaking, cutting, dressing or carrying of bricks, stone, concrete, slag or similar materials by means of a hammer, chisel, pick or similar hand tool, or by means of a portable tool driven by mechanical power, and the dry grinding of surfaces of any such materials by means of a wheel or disc driven by mechanical power, where, in any of the foregoing causes, particles or fragments are liable to be thrown off towards the face of the operator in the course of the process.
2. Dry grinding of surfaces of metal by applying them by hand to a wheel, disc or band driven by mechanical power, and of surfaces of metal by means of a portable tool driven by mechanical power.
3. Dividing into separate parts of metal, bricks, stone, concrete or similar materials by means of a high speed saw driven by mechanical power or by means of an abrasive cutting-off wheel or disc driven by mechanical power, where particles or fragments are liable to be thrown off towards the face of the operator in the course of process.
4. Turning of metals or articles of metal, where particles or fragments are liable to be thrown off towards the face of the operator in the course of the process.
5. Drilling by means of portable tools, where particles or fragments are liable to be thrown off towards the face of the operator in the course of the process.
6. Welding and cutting of metals by means of an electric, oxy-acetylene or similar process.
7. Hot fettling of steel castings by means of a flux-injected burner or air torch, and de-seaming of metal.
8. Fettling of metal castings involving the removal of metal, including runners, gates and risers, and removal of any other material during the course of such fettling.
9. Chipping of metal, and chipping, knocking out, cutting out or cutting off of cold rivets, bolts, nuts, lugs, pins, collars or similar articles from any structure or plant, or from part of any structure or plant, by means of a hammer, chisel, punch or similar hand tool, or by means of a portable tool driven by mechanical power.
10. Chipping or scurffing of paint, scale, slag, rust or other corrosion from the surface of metal and other hard materials by means of a hand tool or by a portable tool driven by mechanical power.
11. Breaking of scrap metal by means of a hammer or by means of a tool driven by mechanical power.
12. Routing of metal, where particles or fragments are liable to be thrown off towards the face of the operator in the course of the process.
13. Work with drop hammers and power hammers used in either case for the manufacture of forgings, and work by any person not working with such

hammers, whose work is carried on in such circumstances and in such a position that particles or fragments are liable to be thrown off towards his face during work with drop hammers or power hammers.

14. Work at a furnace where there is risk to the eyes from molten metal.
15. Pouring or skimming of molten metal.
16. Work involving risk to the eyes from hot sand being thrown off.
17. Turning or dressing of an abrasive wheel.
18. Handling in open vessels or manipulation of strong acids or dangerous corrosive liquids or materials, and operation, maintenance or dismantling of plant or any part of plant, being plant or part of plant which contains or has contained such acids, liquids or materials, unless the plant or part of plant has been so prepared (by isolation reduction of pressure, or otherwise), treated, or designed and constructed as to prevent risk of injury.
19. Any other process wherein there is a risk of injury to eyes from particles or fragments thrown off during the course of the process.

Schedule II

1. Welding or cutting of metals by means of an electrical, oxy-acetylene or similar process.
2. All work on furnaces where there is risk of exposure to excessive light or infra-red radiations.
3. Process such as rolling, casting or forging of metals, where there is risk of exposure to excessive light or infra-red radiations.
4. Any other process wherein there is a risk of injury to eyes from exposure to excessive light or infra-red or ultraviolet radiations.

Rule 78. Minimum dimensions of man-holes:-

In any factory no person shall be allowed or required to enter in any chamber, tank, vat, pipe flue or other confined space, which persons may have to enter unless the said chamber, tank, vat, pipe flue or other confined space, is provided with a man-hole which may be rectangular, oval or circular in shape unless there is other effective means of egress and -

- a) in the case of rectangular or oval shape, be not less than shoulder width of the person concerned plus 8 cm. in length and 30 cm. wide;
- b) in the case of a circular shape be not less than shoulder width of the person concerned plus 8 cm. in diameter.

Exemption under sub-section (5) of section (37)

Rule 79. Exemptions. The requirements of sub-section (4) of section 37 shall not apply to the following processes carried on in any Factory:-

- a) The operation of repairing a water-sealed gas-holder by the electric welding process, subject to the following conditions:-
 - i) The gas-holder shall contain only the following gases, separately or mixed at a pressure greater than atmospheric pressure, namely, town gas, coke-oven gas, producer gas, blast furnace gas, or gases, other than air, used in their manufacture:
Provided that, this exemption shall not apply to any gasholder containing acetylene or mixture of gases, to which acetylene has been added intentionally; and

- ii) Welding shall be done by the electric welding process and shall be carried out by experienced operatives under the constant supervision of a competent person.
- b) The operations of cutting or welding steel or wrought iron gas mains and services by the application of heat, subject to the following conditions:
 - i) The main or service shall be situated in the open air, and it shall contain only the following gases, separately or mixed at a pressure greater than atmospheric pressure, namely, town gas, coke-oven gas, producer gas, producer gas, blast furnace gas, or gases other than air, used in their manufacture.
 - ii) The main or service shall not contain acetylene or any gas or mixture of gases to which acetylene has been added intentionally;
 - iii) The operation shall be carried out by an experienced person or persons and at least two persons (including those carrying out the operations) experienced in work on gas mains and over 18 years of age shall be present during the operation;
 - iv) The site of the operation shall be free from any inflammable or explosive gas or vapour;
 - v) Where acetylene gas is used as a source of heat in connection with an operation, it shall be compressed and contained in a porous substance in a cylinder; and
 - vi) Prior to the application of any flame to the gas main or service, this shall be pierced or drilled and the escaping gas ignited.
- c) The operation of repairing an oil tank on any ship by the electric welding process, subject to the following conditions:-
 - i) The only oil, contained in the tank shall have a flash point of not less than 150 of (close test) and a certificate to this effect shall be obtained from 2 competent analysts;
 - ii) The analyst's certificate shall be kept available for inspection by an Inspector, or by any person employed or working on the ship;
 - iii) The Welding operation shall be carried out only on the exterior surface of the tank at a place (a) which is free from oil or oil leakage in inflammable quantities and (b) which is not less than 30 centimeters below the nearest part of the surface of the oil within the tank; and
 - iv) Welding shall be done only by the electric welding and shall be carried out by experienced operatives under the constant supervision of a competent person.

Rule 80. Fire protection -

- 1) Processes, equipment, plant, involving serious explosion and serious fire hazards:-
 - a) All processes, storages, equipments, plants, etc. involving serious explosion and flash fire hazard shall be located in segregated buildings where the equipment shall be so arranged that only a minimum number of employees are exposed to such hazards at any one time.
 - b) All industrial processes involving serious fire hazard should be located in buildings or work places separated from one another by walls of fire-resistant construction.
 - c) Equipment and plant involving serious fire or flash fire hazard shall, wherever possible be so constructed and installed that in case of fire, they can be easily isolated.

- d) Ventilation ducts, pneumatic conveyors and similar equipment involving a serious fire risk should be provided with flame arresting or automatic fire extinguishing appliance of fire resisting dampers electrically interlocked with heat sensitive/smoke detectors and the air-conditioning plant system.
 - e) In all workplaces having serious fire or flash fire hazard, passages between machines, installations or piles of material should be at least 90 cm. wide. For storage pile the clearance between the ceiling and Top of the pile should not be less than 2 meter.
- 2) Access for fire fighting:-
- a) Buildings and plants shall be so laid out and roads, passageways etc. so maintained as to permit unobstructed access for fire fighting.
 - b) Doors, and window openings shall be located in suitable positions on all external walls of the building to provide easy access to the entire area within the building for fire fighting.
- 3) Protection against lightning:- protection from lightning shall be provided for:-
- a) building in which explosive or highly flammable substance are manufactured, used handle or stored.
 - b) storage tanks containing oils, paints, or other flammable liquids.
 - c) grain elevation;
 - d) buildings, tall chimneys or stacks where flammable gases, fumes, dust, or lint are likely to be present;
 - e) sub-station buildings and out door transformers and switch yards.
- 4) Explosive : All explosive shall be handled, transported, stored and used in accordance with the provisions of the Indian Explosive Act, 1884 (4 of 1894).
- 5) Precautions against ignition. - Wherever there is danger of fire or explosion from accumulation of flammable of explosive substances in air -
- a) all electrical apparatus shall either be excluded from the area of risk or they shall be of such construction and so installed and maintained as to prevent the danger of their being a source of ignition;
 - b) effective measures shall be adopted for prevention of accumulation of static charges to a dangerous extent;
 - c) workers shall wear shoes without iron or steel nails or any other exposed ferrous materials which is likely to cause sparks by friction;
 - d) smoking, lighting or carrying of matches, lighters or smoking materials shall be prohibited.
 - e) transmission belts with iron fasteners shall not be used; and
 - f) all other precautions, as are reasonably practicable, shall be taken to prevent initiation of ignition from all other possible sources such as open flames, frictional sparks, overheated surfaces of machinery or plant, chemical or physical-chemical reaction and radiant heat.
- 6) Spontaneous ignition:- Where materials are likely to induce spontaneous ignition, care shall be taken to avoid formation of air pocket and to ensure adequate ventilation. The material susceptible to spontaneous ignition should be stored in dry condition and should be in heaps of such capacity and separated by such passage which will prevent fire. The materials susceptible to ignition and stored in the open shall be at a distance not less than 10 meters away from process or storage buildings.
- 7) Cylinders containing compressed gas:- Cylinders containing compressed gas may only be stored in open if they are protected against excessive variation of temperature, direct rays of sun, or continuous dampness. Such cylinders shall never be stored near highly flammable substances, furnaces or hot processes. The room where such cylinders are stored shall have adequate ventilation.

- 8) Storage of flammable liquids:-
 - a) The quantity of flammable liquids in any work room shall be the minimum required for the process or processes carried on in such room. Flammable liquids shall be stored in suitable containers with close fitting covers: provided that not more than 20 litres of flammable liquids having a flash point of 21⁰C or less shall be kept or stored in any work room.
 - b) Flammable liquids shall be stored in closed containers and in limited quantities in well ventilated rooms of fire resisting construction which are isolated from the remainder of the building by fire walls and self closing fire doors.
 - c) Large quantities of such liquids shall be stored in isolated adequately ventilated building of fire resisting construction or in storage tanks, preferably underground and at a distance from any building as required in the Petroleum Rules, 1976.
 - d) Effective steps shall be taken to prevent leakage of such liquids into basements, sumps or drains and to confine any escaping liquid within safe limits.
- 9) Accumulation of flammable dust, gas, fume or vapour in air or flammable waste material on the floors:-
 - a) Effective steps shall be taken for removal or prevention of the accumulation in the air of flammable dust, gas, fume or vapour to an extent which is likely to be dangerous.
 - b) No waste material of a flammable nature shall be permitted to accumulate on the floors and shall be removed at least once in a day or shift, and more often, when possible. Such materials shall be placed in suitable metal containers with covers wherever possible.
- 10) Fire exits:-
 - a) In this rule:-
 - i) "horizontal" exits" means an arrangement which allows alternative egress from a floor area to another floor at or near the same level in an adjoining building or an adjoining part of the same building with adequate separation and
 - ii) "travel distance" means the distance an occupant has to travel to reach an exit.
 - b) An exit may be doorway, corridor, passageway to an external stairway or to a verandah or to an internal stairway segregated from the rest of building by fire resisting walls which shall provide continuous and protected means or egress to the exterior of a building or to an exterior open space. An exit may also include a horizontal exit leading to an adjoining building at the same level.
 - c) Lifts, escalators and revolving doors shall not be considered as exits for the purpose of this sub-rule.
 - d) In every room of a factory exits sufficient to permit safe escape of the occupants in case of fire or other emergency shall be provided which shall be free of any obstruction.
 - e) The exits shall be clearly visible and suitably illuminated with suitable arrangement, whatever artificial lighting is to be adopted for this purpose, to maintain the required illumination in case of failure of the normal source of electric supply.
 - f) The exits shall be marked in a language understood by the majority of the workers.
 - g) Iron rung ladders or spiral staircases shall not be used as exit staircases.

- h) Fire resisting doors or roller shutters shall be provided at appropriate places along the escape routes to prevent spread of fire and smoke, particularly at the entrance of lifts or stair where funnel or flue effect may be cleared inducing an upward spread of fire.
- i) All exits shall provide continuous means of egress to the exterior of a building or to an exterior open space leading to a street.
- j) Exits shall be so located that the travel distance to reach at least one of them on the floor shall not exceed 30 meters.
- k) In case of those factories where high hazard materials are stored or used, the travel distance to the exit shall not exceed 22.5 metres and there shall be at least two ways of escape from every room, however small, except toilet rooms, so located that the points of access thereto are out of or suitable shielded from areas of high hazard.
- l) Whenever more than one exit is required for any room space of floor, exits shall be placed as remote from each other as possible and shall be arranged to provide direct access in separate directions from any point in the area served.
- m) The unit of exit width used to measure capacity of any exit shall be 50 cm. A clear width of 25 cm. shall be counted as an additional half unit. Clear width of less than 25 cm. shall not be counted for exit width.
- n) Occupants per unit width shall be 50 for stairs and 75 for doors.
- o) For determining the exits required, the occupant load shall be reckoned on the basis of actual number of occupants within any floor area or 10 square metres per person, whichever is more.
- p) There shall not be less than two exits serving every floor area above and below the ground floor, and at least one of them shall be an internal enclosed stairway.
- q) For every building or structure used for storage only, and every section thereof considered separately, shall have access to at least one exit so arranged and located as to provide a suitable means of escape for any persons may be normally present, at least two separate means of exit shall employ therein and in any such room wherein more than 10 persons be available, as remote from each other as practicable.
- r) Every storage area shall have access to at least one means of exit which can be readily opened.
- s) Every exit doorway shall open into an enclosed stairway, a horizontal exit on a corridor or passageway providing continuous and protected means of egress.
- t) No exit doorway shall be less than 100 cm in width, Doorways shall be not less than 200 cm, in height.
- u) Exit doorways shall open outwards, that is, away from the room but shall not obstruct the travel along any exit. No door when opened, shall reduce the required width of stairway or landing to less than 90 cm. Over head or sliding doors shall not be installed for this purpose.
- v) An exit door shall not open immediately upon a flight of stairs. A landing at least 1.5m × 1.5m in size shall be provided in the stairway at each doorway. The level of landing shall be the same as that of the floor which it serves.
- w) The exit doorways shall be open able from the side which they serve without the use of a key.
- x) Exit, corridors and passageways shall be of a width not less than the aggregate required width of exit doorways leading the side.

- y) Where stairways discharge through corridors and passageways, the height of the corridors and passageways shall not be less than 2.4 metres.
- aa) Internal stairs shall be constructed of non-combustible materials throughout.
- bb) Internal stairs shall be constructed as a self-contained unit with at least one side adjacent to external wall and shall be completely enclosed.
- cc) A stair case shall not be arranged round a lift shaft unless the latter is totally enclosed by a material having a fire resistance rating not lower than that of the type of construction of the former.
- dd) Hollow combustible construction shall not be permitted.
- ee) The minimum width of an internal staircase shall be 100 cm.
- ff) The minimum width of treads without nosing shall be 25 cm, for an internal staircase. The Treads shall be constructed and maintained in a manner to prevent slipping.
- gg) The maximum height of a riser shall be 19 cm, and the number of risers shall be limited to 12 per flight.
- hh) Hand rails shall be provided with a minimum height of 100 cm. and shall be firmly supported.
 - ii) To use of spiral staircase shall be limited to low occupant load and to building of height of 9 metres, unless they are connected to platforms such as balconies and terraces to allow escapees to pause.
A spiral staircase shall be not less than 300 cm. in diameter and have adequate head room.
- jj) The width of a horizontal exit shall be same as for the exit doorways.
- kk) The horizontal exit shall be equipped with at least one fire door of self closing type.
 - ll) The floor area on the opposite or refuge side of a horizontal exit shall be sufficient to accommodate occupants of the floor areas served allowing not less than 0.3 square metre per person. The refuge area shall be provided with exits adequate to meet the requirements of this sub-rule. At least one of the exits shall lead directly to the exterior or street.
- mm) Where there is difference in level between connected areas for horizontal exit, ramps not more than 1 in 8 slope be provided, for this purpose steps shall not be used.
- nn) Doors in horizontal exits shall be openable at all times.
- oo) Ramps with a slope of not more than 1 in 10 may be substituted for the requirements of staircase. For all slopes exceeding 1 in 10 and wherever the use is such as to involve danger of slipping, the ramp shall be surfaced with non-slipping material.
- pp) In any building not provided with automatic fire alarm, a manual fire alarm system shall be provided if the total capacity of the building is over 500 persons, or if more than 25 persons are employed above or below the ground floor, except that no manual fire alarm shall be required in one-storey buildings where the entire area is undivided and all parts thereof are clearly visible to all occupants.
- qq) The Chief Inspector may by an order in writing exempt any factory or part of it from all or any of the provisions of this rule to such extent and on such conditions as may be deemed necessary.

Rule 81. Means of Escape for Cotton Ginning Factories:-

Notwithstanding anything contained in rule 80 cotton ginning factories shall be provided with at least two suitable ramps or two flights of stairs made of brick work or other fire-resisting material.

Rule 82. Fire-fighting apparatus and water supply:-

- 1) First-aid fighting equipment -
 - a) In every factory there shall be provided and maintained adequate and suitable fire fighting equipment for fighting fires in the early stages, those being referred to as first-aid fire fighting equipment in this rule.
 - b) The types of first-aid fire fighting equipment to be provided shall be determined by considering the different types of fire risks which are classified as follows:-
 - i) "Class A fire" - Fire due to combustible materials such as wood, textiles, paper, rubbish and the like.
 - 1) "Light hazard" - Occupancies like offices, assembly halls, canteens, rest-rooms, ambulance rooms and the like;
 - 2) "Ordinary hazard" - Occupancies like saw mills, carpentry shop, shall timber yards, book binding shops, engineering workshop and the like;
 - 3) "Extra hazard" - Occupancies like large timber yards, godowns storing fibrous materials, flour mills, cotton mills, jute mills, large wood working factories and the like;
 - ii) "Class B fire" - Fire in flammable liquids like oil, petroleum products, solvents, grease, paint, etc.
 - iii) "Class C fire" - Fire arising out of gaseous substances.
 - iv) "Class D fire" - Fire from reactive chemicals, active metals and the like.
 - v) "Class E fire" - Fire involving electrical equipment and delicate machinery and the like.
- 2) In every factory adequate provision of water-supply for fire fighting shall be made and where the amount of water required in liters per minute is 550 liters or more as calculated from the formula mentioned below, power-driven trailer pumps of adequate capacity shall be provided and maintained:-

$$\text{Water required in liters per minute} = \frac{A + B + C + D}{20}$$

- A = the total area in square meters of all floors including galleries in all buildings of the factory.
- B = the total area in square meters of all floors and galleries including open spaces in which combustible materials are handled or stored.
- C = the total area in square meters of all floors and over 15 meter above ground level and
- D = the total area in square meters of all floors of buildings other than those of fire resisting construction provided fire-resisting constructions of various floors is so certified by any Fire Association of Fire Insurance Company;

Provided that, in areas where the fire risk involved does not require use of water such areas under B,C, or D may, for the purpose of calculation be halved;

Provided further that, where the areas under B,C,D are protected by permanent automatic fire-fighting installations approved by any Fire Association or Fire Insurance Company, such area/areas may, for the purpose of calculation be halved;

Provided also that, where the factory is situated at not more than 3 kilometers from an established city or town fire service, the pumping capacity based on the amount of water arrived at by the formula above may be reduced by 25 percent but no account shall be taken of this reduction in calculating water supply required under sub-rule (2)

- 3) Each trailer pump shall be provided with equipments as given schedule A. such equipment shall conform to Indian Standard specifications whenever they exist.
- 4) Trailer pump shall be housed in a separate shed which shall be sited close to a principal source of water supplies in the vicinity of the main risks of the factory.
- 5) In factories where the area is such as can not be reached by man hauling of trailer pumps within reasonable time, vehicles with towing attachment shall be provided at the scale of one for every four trailer pumps with a minimum of one such vehicle kept available at all times.
- 6) Water-supply shall be provided to give flow of water as required under sub-rule (2) for at least 100 minutes. At least 50 percent of this water-supply or 4,50,000 litres which ever is less shall be in the form of overhead tanks of adequate capacities (not less than 45,000 litres each) distributed round the factory with due regard to the potential fire risks in the factory, (where piped supply is provided, the size of the main shall not be less than 15 cm. diameter and it shall be capable of supplying minimum of 4,500 litres per minute at a pressure of not less than 7kg/sq cm.

Every type of portable fire extinguisher shall be kept mounted in a position approved by the Inspector.

Provided that where the Chief Inspector is of the opinion that other adequate fire-fighting apparatus or permanent automatic fire-fighting installation approved by any recognized Fire Association or Fire Insurance Company are provided in the factory building or room, he may issue a certificate in writing (which he may at his discretion revoke) specifying the extent to which the above requirements are relaxed in respect of that building or room.

- a) Every portable fire extinguisher to be provided shall -
 - i) conform to the appropriate Indian standards specifications;
 - ii) be kept charged ready for use properly mounted in a position approved by the Inspector and in accordance with the makers recommendation.
 - iii) be examined, tested or discharged periodically in accordance with the makers recommendation.
 - b) The manager of every factory shall keep and maintain, sufficient number of spare charges for each type of extinguisher provided in the factory with minimum of 12 spare charges always in stock and readily available.
- 7) Each factory shall detail a trained officer who shall be responsible for the proper maintenance and upkeep of all fire-fighting equipments.
 - 8) If the Chief Inspector is satisfied in respect of any part of the factory that owing to the exceptional circumstances such as inadequacy of water supply or for infrequency of the manufacturing process or for any other reason, to be recorded in writing all or any of the requirements of the rules are impracticable or not necessary for the protection of workers, he may by order in writing (which he may at his discretion revoke) exempt such factory or part of that factory from all or any of the provisions of the rules subject to conditions as he may by such order prescribe.

Schedule – A

Equipment of trailer Pumps.

A. For light trailer pump (680 litres/min)

Nine metres length of armoured suction hose, with wrenches.

- 1 Metal suction strainer
- 1 Basket strainer
- 1 Two-way suction collecting-head
- 1 Suction adaptor.
- 10 Twenty-five metres lengths of unlined 75 mm delivery hose complete with quick-release couplings.
- 1 Dividing breeching-piece
- 2 Branch-piece with 15 mm nozzles.
- 1 Diffuser nozzle
- 1 Standpipe with blank cap
- 1 Hydrant key.
- 4 Collapsible canvas buckets.
- 1 Fire hook (preventor) with cutting edge.
- 1 C.T. Co extinguisher one litre capacity.
- 1 Thirty metres length of 25 mm manila rope.
- 1 Nine metres extension ladder (where necessary).
- 1 Heavy axe.
- 1 Spade.
- 1 Pick, axe.
- 1 Crowbar.
- 1 Saw.
- 1 Hurricane lamp.
- 1 Electric torch.
- 1 Pair rubber gloves.

B. For large trailer Pump (1,800 litres /min) -

Nine metres length of armoured suction hose, with wrenches.

- 1 Metal strainer.
- 1 Basket strainer.
- 1 Three way suction collecting head.
- 1 Suction adaptor.
- 14 Twenty-five metres length of unlined canvas 75 mm. delivery hoses complete with quick-release couplings.
- 1 Dividing breech-piece.
- 1 Collecting breaching-piece.
- 4 Branch pipes with one 25 mm, two 20 mm and one diffuser nozzles.
- 2 Standpipe with blank caps.
- 2 Hydrant keys.
- 6 Collapsible canvas buckets.
- 1 Ceiling hook (preventor) with cutting edge.
- 1 C.T.C. extinguisher one litre capacity.
- 1 Thirty metres length of 50 mm. manila rope.
- 1 Nine metres extension ladder (where necessary)
- 1 Pair rubber gloves.
- 1 Heavy axe.
- 1 Spade.
- 1 Pick-axe.
- 1 Crowbar.
- 1 Saw.

- 1 Hurricane lamp.
- 1 Electric, torch.

Notes:- If it appears to the Chief Inspector of Factories that in any factory the provisions of breathing apparatus is necessary, he may by order in writing require the occupier to provide suitable breathing apparatus in addition to the equipment for light trailer pump or large trailer pump, as the case may be.

Rule 83. Ladders.-

The ladder should be suitable for the job, of adequate length and of sound construction. Ladder should be provided with nonskid device at both ends. The ladder should be firmly secured at top and should have at least 1 metre extension above the platform or working point. When used, there should be not less than 75° angle of the vertical rise and the base.

Rule 84. Protection of workers attending to prime movers.-

1. In every factory the work of oiling or attending to prime movers shall be done only by a specially trained adult male worker authorized to do such work whose name has been recorded in a register separately maintained for the purpose.
2. Every such worker while oiling or attending to prime mover shall wear tight-fitting clothing.
3. A worker required to wear tight-fitting clothing under sub rule(2) shall be provided by the occupier with clothing which shall consist of at least a pair of closely fitting shorts and a closely fitting half-sleeve shirt or vest. Such clothing shall be returned to the occupier on termination of service or when new clothing is provided.

Rule 85. Polymerizing or Curing Machine. -

1. The following precautions shall be taken when fabrics are processed in polymerizing or curing machine for fixing prints by the Emulsion Technique namely:-
 - i) Printed fabrics shall be thoroughly dried by passing them over drying cans or through a hot fuel or other equally effective means, before the same are allowed to pass through the polymerizing machine.
 - ii) The exhaust flap or damper shall be provided with a hole or opening so that at least two-third of it is always open.
 - iii) Infra-red ray heaters of the machines shall be cut off while running the prints.
 - iv) The electrical heater shall be connected to a separate circuit and shall be provided with an isolation switch so as to ensure that it is completely cut off in an emergency.
 - v) The drive of the exhaust fan shall be interlocked with the main drive of the machine in such a way that if the exhaust motor stops, the machine including all heating devices, shall also stop.
 - vi) The electrical heaters shall have thermostat to regulate the temperature, so that the heaters shall be automatically cut off if the temperature rises above the pre-set value.

- vii) Adequate flap shall be provided on top of the machine, which can open and let off the fumes in the case of an explosion.
 - viii) Filter gauze shall be cleaned at least once a week.
 - ix) Exhaust duct shall be clean at least once a week.
 - x) Tension of the V belt drive of the fans shall be checked every week.
2. The machine shall be examined, under the direct supervision of a responsible person designated by the occupier or manager, who by his experience and knowledge of necessary precautions against risk of explosion, is fit to supervise such work.
 3. A register shall be maintained in which the details of various checks carried under sub-rule (2) shall be entered and every entry made therein shall be signed by the person making the checks.

Rule 86. Safety Measure in Factories where Equipments of Pipelines Containing Inflammable Materials are Operated. -

- I) The system of work-permits shall be introduced and unless the equipment or the pipeline is certified to be free of inflammable gas or liquid, no person shall be allowed to enter or open the same.
- II) The work of opening such equipment or pipe line shall not be commenced unless the following operations are carried out and checked by the Supervisor in-charge of the Process Department of the Factory:-
 - i) Blanking operation.- The equipment or pipeline to be opened for repairs or maintenance shall be effectively blanked so as to ensure that no inflammable gas or liquid can enter the same under any circumstances during the operation or repairs or maintenance. The Supervisor of the process Department shall check personally these operations and shall certify accordingly.
 - ii) Flushing operation.- The Supervisor of the Process Department shall carry out the steaming or flushing out with water of the equipment or pipeline to ensure that all inflammable material is removed from the equipment or pipeline and shall certify to that effect.
- III)
 - i) Opening of the equipment.- The Supervisor of the Engineering Department of the factory in-charge of the work of opening of such equipment of pipeline, or getting clearance from the Supervisor in charge of the Process Department, shall satisfy himself that the above operations are complete and shall sign the work permits issued by the Supervisor of the process Department.
 - ii) It shall be the joint responsibility of the Supervisor of the Process Department and the Supervisor of the Engineering Department to check and ensure that hot lines, if any, in the vicinity of such works are properly screened, in accordance with the safety instructions of the factory management. The work permit shall have as specific entry for this operation which shall be signed by both the Supervisors.
- IV) No part of the running equipment or pipeline shall be opened unless a gas test is conducted by a responsible person to ensure that the equipment or pipeline is safe for opening.

- V) No workers whose clothes have been contaminated with inflammable material shall be allowed to work where any such running equipment or pipeline is being opened.
- VI) The Safety Officer or any officer authorized by him, shall have system of random checking on the work permits issued and he shall report any serious deficiencies to the Works Manager directly.
- VII) All drains of such equipments or pipeline shall be laid into the drains to prevent any splashing of the draining inflammable liquids or gases.
- VIII) Before commencing the opening operation, it shall be ensured that a specific person trained in fire-fighting operations is kept available and his presence shall be ensured throughout the operation of the opening of the equipment.

Rule 87. Safety Measure in Gas Works. -

In respect of any factory where inflammable gas is produced by carbonization of a coal, oil or any other similar substance, the following provisions shall be complied with, namely:-

- i) No pipe, valve or any cover of any equipment into which gas is normally allowed to flow shall be opened unless it is ensured that the equipment is no more supplied with any inflammable or explosive gas at a pressure greater than atmospheric pressure.
- ii) Before undertaking repairs of every sort to any pipe, valve or any other equipment connected with any part in the plant or machinery of any gas works (not being a gas-holder) it shall be ensured that the gas under pressure does not reach the point where such pipe, valve or equipment is being opened by the removal of any bolts and nuts or by cutting either by mechanical means or by application of heat and that such pipe, valve or equipment is so isolated from the gas-holder or any other equipment generating gas that no gas under the pressure reaches the point of repair.
- iii) Before loosening the bolts and nuts or before undertaking the cutting or any pipe, valve or equipment in any gas works, a definite test shall be carried out by a competent person that no gas under pressure is fed to the point of repair. Details of the test carried out shall be mentioned in a certificate which shall be signed by the competent person. A copy of such certificate shall be displayed prominently near the plane of repair and shall be made available on demand to every worker employed in connection with such repairs for his perusal.
- iv) Every worker employed in connection with such repairs and working near any pipe, valve or other equipment while it is being opened shall be supplied with a mask and a respirator fed by air fresh from a point away from the point of repair. It shall be ensured that the worker shall wear the respirator while working near the point of repair.
- v) Electrical wiring, or any electrical equipment (not being electrical or welding equipment) used near the point of repair shall be so arranged that there are no trailing cables along the floor. All electrical equipment shall be of flame-proof type:

Provided that the provisions of this rule shall not apply to mains and services, plant or machinery installed in the open air subject to the following conditions:

- a) The main or service shall be situated in the open air, and it shall contain only the following gases, separately or mixed at a pressure greater than atmospheric pressure, namely, town gas, coke oven gas, producer gas, blast furnace gas or gases other than air, used in their manufacture;
- b) The main or service shall not contain acetylene or any gas or mixture of gases to which acetylene has been intentionally added,;
- c) The operation shall be carried out by an experienced person or persons and at least two persons (including those carrying out the operations) experienced in work on gas mains and over 18 years of age shall be present during the operation;
- d) The site of the operation shall be free from any inflammable or explosive gas or vapour;
- e) Where acetylene gas is used as a source of heat in connection with an operation, it shall be compressed and contained in a porous substance in a cylinder; and
- f) Prior to the application of any flame to the gas main or service, this shall be pierced or drilled and the escaping gas ignited.

Explanation –

- 1) It shall not be considered effective measure to stop the gas under pressure from reaching the point of repair if only an inflated bladder causes the obstruction between the source of gas under pressure and the point of repair;
Provided that where gas valves cannot be provided, it shall be considered an effective measure to stop the gas pressure from reaching the point of repairs if inflated bags alone are inserted against gas pressure not in excess of those indicated below:-

Diameter of gas main	Pressure in inches of water guage
Upto and including 4	10
5 to 10	8
11 to 17	6
18 to 24	5
over 24	3

and a competent person is kept constantly during the operation to watch and control the pressures within the limits specified as above and that -

Such bags must be tested on site for soundness and at least two spare bags are available on site.

- 2) The competent person for the purpose of this rule shall be the Chief Engineer of the factory or a person certified by the Chief Engineer in writing to be the competent person.

Rule 88. Fragile Roofs-provision of Crawling Boards etc. -

In any factory, no person shall be required to stand or pass over or work on or near any roof or ceiling covered with fragile material like A.C. sheets or similar material through which he is liable to fall in case it breaks or gives way, a distance of more than three metres unless-

- a) suitable and sufficient ladders, duck ladders or crawling boards, which shall be securely supported, are provided and used; and
- b) a permit to work on the fragile roof is issued to him each time he is required to work thereon by a responsible person of the factory concerned.

Explanation.- Fragile material means sheets made of asbestos cement or made from similar materials such as Perspex, polyester or other types of plastic fibres.

Rule 89. Special Safety Precautions for Certain Highly Hazardous Chemical Process.-

In respect of any factory engaged in carrying out any hazardous chemical processes or such parts of any processes as are specified in the Schedule annexed hereto the following provisions shall be complied with viz.-

1) Process Hazards.-

- a) Before commencing any large scale experimental works or any new manufacture, all possible steps shall be taken to ascertain definitely all the hazards involved both from the actual operations and also from the point of view of the chemical reactions. The properties of the raw materials used, the final products to be made and any by products arising during manufacture shall be carefully studied and adequate and suitable provisions shall be made in advance for dealing with any hazards including effects on workers which may be inherent in the process or which may arise during the process of manufacture.
- b) The plant, machinery or equipment concerned with the hazardous process shall be in-charge of such operators only who have been trained and made thoroughly conversant to be fit persons to be incharge thereof and no other persons shall be allowed to operate the plant, machinery or equipment. The operators shall be regular employees of the occupier and shall in no case be persons who are employed as contract workers.
- c) The work of the operators shall be supervised on an overall basis by at least one competent person, who for the purpose of this sub rule shall at least be a graduate in Chemical Engineering or Chemical Technology with specialized knowledge in respect of the processes given in the schedule; Provided that the Chief Inspector may accept a graduate in chemistry having adequate knowledge of the processes given in the schedule and also adequate experience and training or any other qualifications, if in his opinion they are equivalent to the qualifications aforesaid.

2) Emergency Instructions.- Simple and special instructions shall be framed to ensure that effective measures will be carried out in cases of emergency, to deal with possible escapes of inflammable explosive, toxic or deleterious gases, vapours, liquid or dusts. These instructions shall be in the language understood by the majority of the workers and shall be displayed in bold letters at prominent places in the different sections concerned. All concerned workers shall be suitably trained and fully instructed in the prompt action to be taken in such emergencies and also in the general hazards encountered in this process.

3) Fire and Explosion Risks. - In any part of the factory where there is a danger due to fire or explosion from inflammable gas, vapour or dust.

- i) No internal combustion engine and no electric motor or other electrical equipment or instrument capable of generating sparks or otherwise causing combustion shall be installed or used in a building engaged in the processes. All electrical fitting shall be of suitable flame-proof construction.

- ii) All pipes carrying hot exhaust or chemicals shall be installed outside the plant building and where this is not possible, these pipes including the flanged portion shall be effectively lagged.
 - iii) Where an inflammable atmosphere is likely to occur the soles of footwear worn by workers shall have no metal on them and the wheels of trucks or conveyors shall be constructed of non-sparking materials. Adequate precautions shall be taken to prevent the ignition of explosive or inflammable atmosphere by sparks emitted from locomotives or other vehicles operating in the vicinity.
 - iv) Portable electric hand lamps shall not be used unless of an intrinsically safe type and all portable electric tools and appliances connected by flexible wires shall not be used, unless these are of suitable flame-proof construction.
 - v) No electric arc lamp, no naked light fixed or portable, shall be used and no person shall have in his possession any match or any apparatus of any type for producing a naked light or spark and all incandescent electric lights shall be in double airtight covers.
 - vi) Prominent notices in the language understood by the majority of the workers and legible by day and by night, prohibiting smoking, the use of naked lights and the carrying of matches or any apparatus for producing a naked light or spark shall be affixed at the entrance of every room or place where there is the risk of fire or explosion from inflammable liquid gas, vapour or dust. In the case of illiterate workers, the contents of the notices shall be fully and carefully explained to them when they commence work in the factory for the first time and again when they have completed one week of services.
 - vii) A sufficient supply of spades, scrapers and pails made from suitable non-sparking material shall be provided for the use of persons employed in cleaning out and or removing residues from any chamber, still, tank or other vessels where any inflammable or explosive danger may occur.
 - viii) All machinery and plant, particularly pipe lines, belt drives, stirrer on which static electricity is likely to accumulate shall be effectively earthed. Receptacles for inflammable liquids shall have metallic connections to earthen supply tanks to prevent sparking due to static charge built up.
- d) Additional Special Precautions.
- i) The heating of the process, if required, shall not be carried out by immersion or other types of heaters deriving energy from electricity.
 - ii) The steam heating coils placed in the lower part of the vessel shall never be kept uncovered or allowed to be heated dry. A substantial amount of the liquid shall be ensured in the vessel after each operation to ensure this;
- Provided that in case employing out of vessels filled with high melting products, the steam shall be stopped/disconnected to the heating coils, before draining process is started to ensure that the heating coils are free of steam before they are uncovered.
- iii) Steam shall be supplied through a pressure reducing valve and a safety valve correctly set to ensure that the critical temperature of the process is not exceeded.
 - iv) A suitable rupture disc shall be provided on the vessel in addition to the usual spring loaded safety valve. The pipe duct leading away from the rupture disc shall be taken out of the work-room shall be straight and without any bends in order to minimize resistance at the time of blowing and to avoid any chance of a secondary vapour/air explosion.
 - v) The vent line of the vessel shall carry a flame arrestor.

- vi) Breaking of vacuum, if the process is done under vacuum, on account of consideration of special hazards inherent in the process, shall be done only with nitrogen, other suitable inert gas or steam. Compressed air connection to the manifolds of the vessel equipment shall be avoided.
 - vii) There shall be an automatic cut-off device of steam supply or other heating devices as well as of further feed to the vessel set to operate, no sooner the critical temperature is reached, beyond which the reaction, if any, in the vessels is likely to get out of control or reach run-away state.
 - viii) There shall be arrangement such that it would be possible to introduce quickly, preferably chilled water or atleast ordinary cool water circulation in the steam or other heating coils, no sooner the heating element is cut-off or separate coils or jackets for this purpose shall be ;provided for the vessel.
 - ix) An alarm system shall be provided linked to the pressure indicator of the vessel, so that automatically an audible warning will be given as soon as the pressure exceeds the present safe limit.
 - x) There shall be provided at automatic arrangements such that if the mechanical agitation, where so provided, fails on account of failure of motive power or due to broken shaft, broken blades, failing of blades or such other contingencies, the supply of steam or other heating devices as well as further feed of material would stop automatically.
- 5) Exemptions - If the Chief Inspector is satisfied in respect of any factory or any process that owing to the special conditions or special methods of work adopted or by reason of the infrequency of the process or for other reasons, all or any of the requirement of this rule are not necessary for the protection of persons employed in any factory or any process, he may by order in writing (which he may in his discretion revoke at any time) exempt such factory or such process from all or any of the provisions of this rule, subject to such condition as he may by such order prescribe and he may, in his discretion add, subtract or modify each conditions as deemed fit by him at any time.

SCHEDULE

- 1) Nitro or Amino processes meaning the manufacture of nitro or amino derivative of Phenol Toluene and of Benzene or its Comologus and the making of explosives with the aid of any of these substances.
- 2) Halogenation process meaning the addition or substitution reaction with a wide variety of :
 - a) Chlorination agents and systems such as Chlorine gas, Hydrochloric Acid, Sodium/hypochlorite, Phosgene, Thionyl Chloride (Soc 12) Phosphorus and such others.
 - b) Fluorination agents such as fluorine.
 - c) Bromination agents such as a Bromine.
 - d) Iodination agents such as iodine, in liquid or gas phases.
- 3) Aromatization and Isomerization process.

Rule 90. Planting of Trees.

In every factory wherein more than one hundred workers are ordinarily employed, the occupier of a factory shall plant and maintain trees within the precincts of the factory after the approval of the number, type and layout of trees by the District Forest Officer concerned or any qualified horticulturist.

Rule 91. Hand Protection.

Adequate protection for the hands shall be available for all workers when using cutting or welding apparatus to which oxygen or any flammable gas or vapour is supplied at a pressure greater than atmospheric pressure or when engaged in machine retooling or in transporting or stacking plates or in handling plates at machines.

Rule 92. Head Protection.-

When workers are employed in areas where there is danger of falling objects they shall be provided with suitable safety helmets.

Rule 92 A. Protective equipment.

The Inspector may, having regard to the nature of the hazards involved in work and process carried out, order the Occupier or the Manager in writing to supply to the workers exposed to particular hazard any personal protective equipment as may be found necessary.

Rule 93. Provision of Safety Belts and Life-lines.

- i) Whenever any worker is engaged on work at a place from which he is liable to fall through a distance of more than 2 (two) meters he shall be provided with safety belts equipped with lifelines which are secured with a minimum of slack, to a fixed structure unless any other effective means such as provision of guard rails or ropes are taken to prevent his falling.
- ii) All safety belts and lifelines shall be examined once in six months by a competent person to ensure that no belt or lifeline which is not in good condition is used and entered in a register which shall be produced before the inspector on demand.

Rule 94. Ovens and Driers.

- 1) Application. - This rule shall apply to ovens and driers, except those used in laboratories or kitchens of any establishment and those which have a capacity below 325 litres.
- 2) Definition. - For the purpose of this Rule, oven or drier means any enclosed structure, receptacle, compartment or box which is used for baking, drying or otherwise processing of any article or substance at a temperature higher than the ambient temperature of the air in the room or space in which the oven or drier is situated, and in which a flammable or explosive mixture of air and a flammable substance is likely to be evolved within the enclosed structure, receptacle, compartment or box or part thereof on account of the article or substance which is baked, dried or otherwise processed within it.

- 3) Separate electrical connection.- Electrical power supplied to every oven or drier shall be by means of a separate circuit provided with an isolation switch.
- 4) Design, construction, examination and testing.-
 - a) Every oven or drier shall be properly designed on sound engineering practice and be of good construction, sound materials and adequate strength, free from any patent defects and safe if properly used.
 - b) No oven or drier shall be taken into use in a factory for the first time unless a competent person has thoroughly examined all its parts and carried out the tests as are required to establish that the necessary safe systems and controls provided for safety in operation for the processes for which it is to be used and a certificate of such examination and tests signed by that competent person has been obtained and is kept available for inspection.
 - c) All parts of an oven or drier which has undergone any alteration or repair which has the effect of modifying any of the design characteristics, shall not be used unless a thorough examination and tests as have been mentioned in clause (b) has been carried out by a competent person and a certificate of such examination and tests signed by that competent person has been obtained and is kept available for inspection.
- 5) **Safety Ventilation-**
 - a) Every oven or drier shall be provided with a positive and effective safety ventilation system using one or more motor-driven centrifugal fans so as to dilute any mixture of air and any flammable substance that may be formed within the oven or drier and maintain the concentration of the flammable substance in air at a safe level of dilution.
 - b) The safe level of dilution referred to in clause (a) shall be so as to achieve a concentration of the concerned flammable substance in air of not more than 25 percent of its lower explosive limit.
 Provided that a level of concentration in air upto 50 percent of the lower explosive limit of the concerned flammable substance may be permitted to exist subject to installation and maintenance of an automatic device which-
 - i) shows continuously the concentration of the flammable substances in air present in the oven or drier at any instant;
 - ii) sounds an alarm when the concentration of the flammable substance in air in any part of the oven or drier reaches a level of 50 percent of its lower explosive limit; and
 - iii) shuts down the heating system of the oven or drier automatically when the concentration in air of the flammable substance in any part of the oven or drier reaches a level of 60 percent of its lower explosive limit, is provided to the oven or drier and maintained in efficient working condition.
 - c) No oven or drier shall be operated without its safety ventilation system working in an efficient manner.
 - d) No oven or drier shall be operated with a level of dilution less than what is referred to in clause (b).
 - e) Exhaust ducts of safety ventilation systems should be so designed and placed that their ducts discharge the mixture of air and flammable substance away from the workrooms and not near windows or doors or other openings from where the mixture could re-enter the workrooms.
 - f) The fresh air admitted into the oven or drier by means of the safety ventilation system shall be circulated adequately by means of circulating fan or fans through all parts of the oven or drier so as to ensure that there

are no locations where the flammable substance can accumulate in the air or become pocketed to any dangerous degree.

- g) Throttling dampers in any safety ventilation system should be so designed by cutting away a portion of the damper or otherwise, that the system will handle atleast the minimum ventilation rate required for safety when they are set in their maximum throttling position.

6) Explosion panels.-

- a) Every oven or drier having an internal total space of not less than half cubic metre shall be provided with suitably designed explosion panels so as to allow release of the pressure of any possible explosion within the oven or drier through explosion vents.

The area of openings to be provided by means of such vents together with the area of openings of any access doors which are provided with suitable arrangements for their release in case of an explosion, shall be not less than 2200 square centimeter for every one cubic metre of volume of the oven or drier. The design of the explosion panels and doors as above said shall be such as to secure their complete release under an internal pressure of 0.25 kg per square centimeter.

- b) The explosion releasing panels, shall, as far as practicable, be situated at the roof of the oven or drier or at those portions of the walls where persons do not remain in connection with operation of the oven or drier.

7) Interlocking arrangements.-

- a) In each oven or drier efficient inter-locking arrangement shall be provided and maintained to ensure that-

- i) all ventilating fans and circulating fans whose failures would adversely effect the ventilation rate of flow pattern, are in operation before any mechanical conveyor that may be provided for feeding the articles or substances to be processed in the oven or drier is put into operation;
- ii) failure of any of the ventilating or circulating fans will automatically stop any conveyor as referred to in clause(i) as may be provided, as well as stop the fuel supply by closing the shut off valve and shut off the ignition in the case of gas or oil fired ovens, and in the case of electrically heated ovens switch off the electrical supply to the heaters;
- iii) the above said mechanical conveyor is set in operation before the above said shut off valve can be energized; and
- iv) the failure of the above said conveyor will automatically close the above said shut off valve in the case of ovens and driers heated by gas, oil or steam and deactivate the ignition system, or cut off the electrical heaters in the case of electrically heated ovens or furnaces.

- 8) Automatic preventilation. Every oven or drier heated by oil, gas, steam or electricity shall be provided with an efficient agangement for automatic preventilation consisting of atleast 3 volume changes with fresh air by operation of safety ventilation fans and the circulating fans (if used) so as to effect purging of the oven or drier of any mixture of air and a flammable substance before the heating system can be activated and before the conveyor can be placed in position.

- 9) Temperature control.- Every oven or drier shall be provided with an automatic arrangement to ensure that the temperature within does not exceed a safe upper present limit to be decided in respect of the particular processing being carried on.

- 10) Multistage processes.- Wherever materials are to be processed in ovens or driers in successive operations, suitable arrangement should be provided to ensure that the operating temperature necessary for safe operation at each stage are maintained within the design limits.
- 11) Combustible substances not to drip on electrical heaters or burners flame.- Effective arrangements shall be provided in every oven or drier to prevent dripping of combustible substances on electric heaters or burner flame used for heating.
- 12) Periodical examination, testing and maintenance.-
 - a) All parts of every oven and drier shall be properly maintained and thoroughly examined and the various controls as mentioned in this rule and the working of the oven or drier tested at frequent intervals to ensure its safe operation by a responsible person designated by the occupier or manager, who by his experience and knowledge of necessary precautions against risks of explosion, is fit to undertake such work.
 - b) A register shall be maintained in which the details of the various tests carried out from time to time under clause (a) shall be entered and every entry made shall be signed by the person making the tests.
- 13) Training of operators. No person shall be assigned any task connected with operation of any oven or drier unless he has completed 18 years of age and he is properly trained.
- 14) Polymerising machine.-
 - a) Printed fabric shall be thoroughly dried by passing them oven drying cans or through hot flue or other equally effective means, before the same is allowed to pass through polymerising machines.
 - b) Infrared ray heaters of polymerizing machines shall be cut off while running the prints.

Rule 95. Reaction vessels and kettles.-

- 1) This rule applies to reaction vessels and kettles, hereinafter referred to as reaction vessels, which normally work at a pressure not above the atmospheric pressure but in which there is likelihood of pressure being created above the atmospheric pressure due to reaction getting out of control or any other circumstances.
- 2) In the event of the vessel being heated by electrical means, a suitable thermostatic control device shall be provided to prevent the temperature exceeding the safe limit.
- 3) Where steam is used for heating purposes in a reaction vessel, it shall be supplied through a suitable pressure reducing valve or any other suitable automatic device to prevent the maximum permissible steam pressure being exceeded, unless the pressure of the steam in the supply line itself cannot exceed the said maximum permissible pressure.
- 4) A suitable safety valve or rupture disc of adequate size and capacity shall be provided to effectively prevent the pressure being built up in the reaction vessel beyond the safe limit. Effective arrangements shall be made to ensure that the released gases, fumes, vapours, liquids, or dusts, as the case may be, are led away and disposed of through suitable pipes without causing any hazard. Where flammable gases or vapours are likely to be vented out from the vessel, the discharge end shall be provided with a flame arrestor.
- 5) Every reaction vessel shall be provided with a pressure gauge having the appropriate range.
- 6) In addition to the devices as mentioned in the foregoing provisions, means shall be provided for automatically stopping the feed into the vessel as soon as process

conditions deviate from the normal limits to an extent which can be considered as dangerous.

- 7) Wherever necessary, an effective system for cooling, flooding or blanketing shall be provided, for the purpose of controlling the reaction and process conditions within the safe limits of temperature and pressure.
- 8) An automatic auditory and visual warning device shall be provided for clear warning whenever process conditions exceed the present limits. This device, wherever possible, shall be integrated with automatic process correction systems.
- 9) A notice pointing out the possible circumstances in which pressures above atmospheric pressure may be built up in the reaction, the dangers involved and the precautions to be taken by the operators shall be displayed at a conspicuous place near the vessel.

Rule 96. Examination of eye sight of certain workers.-

- 1) No person shall be employed to operate a crane, locomotive or forklift truck, or to give signals to a crane or locomotive operator unless his eye sight and colour vision have been examined and declared fit by a qualified ophthalmologist to work whether with or without the use of corrective glasses.
- 2) The eye sight and colour vision of the person employed as referred to in clause (1) shall be examined at least once in every period of 12 months upto the age of 45 years and once in every 6 months beyond that age.
- 3) Any fee payable for an examination of a person under this sub-rule shall be paid by the occupier and shall not be recoverable from that person.
- 4) The record of examination or re-examination carried out as required under sub-rule (1) shall be maintained in **Form 18**.

Rule 97. Railways in factories.

- 1) This shall apply to railways in the precincts of a factory which are not subject to Indian Railways Act. 1890 (Central Act IX of 1890).
- 2) Gateways.- A Gateway through which a railway track passes shall not be used for the general passage of workers into or out of a factory.
- 3) Barriers and turngates.-
 - a) Where building or walls contain doors or gates which open to a railway track, a barrier about 1 metre high shall be fixed parallel to and about 60 cm. away from the building or wall outside the opening and extending several feet beyond it at either end, so that any person passing out may become aware of an approaching train when his pace is checked at the barrier.
If the traffic of the nearest track is all in one direction, the barrier shall be in the form of a 'L' with the end of the short leg abutting on to the wall and the other end opening towards the approaching train.
 - b) If the distance between wall and track cannot be made to accommodate such a barrier, the barrier or a turngate shall be placed at the inside of the opening.
 - c) Where a footway passes close to a building or other obstruction as it approaches a railway track, a barrier or a turngate shall be fixed in such a manner that a person approaching the track is compelled to move away from the building or obstruction and thus obtain timely sight of an approaching locomotive or wagon.
- 4) Crowd.-
 - a) Workers pay-window, first-aid stations and other points where a crowd may collect shall not be placed near a railway track.

- b) At any time of the day when workers are starting or ending work, all railways traffic shall cease for not less than five minutes.
- 5) Locomotives.-
 - a) No locomotives shall be used in shunting operations unless it is in good working order.
 - b) Every locomotive and tender shall be provided with efficient brakes, all of which shall be maintained in good working order. Brake shoes shall be examined at suitably fixed interval and those that are worn out replaced at once.
 - c) Water-gauge glasses of every locomotive, whatever its boiler pressure, shall be protected with substantial glass or metal screens.
 - d) Suitable steps and hand-holds shall be provided at the corners of the locomotive for the use of shunters.
 - e) Every locomotive crane shall be provided with lifting and jacking pads at the four corners of the locomotive for assisting in re-railing operations.
 - f) It shall be clearly indicated on every locomotive crane in English and in language understood by the majority of the workers in the factory, for what weight of load and at what radius the crane is safe.
- 6) Wagons.-
 - a) Every wagon (and passenger coach, if any) shall be provided either with self-acting brakes capable of being applied continuously or with efficient hand brakes which shall be maintained, in good working order. The hand brakes shall be capable of being applied by a person on the ground and fitted with a device for retaining them in the applied position.
 - b) No wagon shall be kept standing within 3 metres of any authorized crossing.
 - c) No wagon shall be moved with the help of crow bars or pinch bars.
- 7) Riding on locomotive, wagon or other rolling stock.- No person shall be permitted to be upon (whether inside or outside) any locomotive wagon or other rolling stock except where secure foot hold and hand hold are provided.
- 8) Attention to brakes and doors.-
 - a) No locomotive, wagon or other rolling stock shall be kept standing unless its brakes are firmly applied and, where it is on a gradient, without sufficient number of properly constructed scotches placed firmly in position.
 - b) No train shall be set in motion until shunting jamadar has satisfied himself that all wagon doors are securely fastened.
- 9) Projecting loads and cranes.-
 - a) If the load on a wagon projects beyond its length, a guard or dumm-truck shall be used beneath the projection.
 - b) No locu-crane shall travel without load unless the jib is completely lowered and positioned in line with the track.
 - c) When it is necessary for a loco-crane to travel with a load, the jib shall not be swung until the loco-crane has come to rest.
- 10) Loose shunting.- Loose shunting shall be permitted only when it cannot be avoided. It shall never be performed on a wagon not accompanied by a man capable of applying and pinning down the brakes. A wagon not provided with brakes in good working order and capable of being easily pinned down shall not be loose shunted, unless there is attached to it at least another wagon with such

brakes. Loose shunting shall not be performed with, or against a wagon containing passengers, live-stock or explosives.

- 11) Fly-shunting.- Fly shunting shall not be permitted on any factory railway.
- 12) The shunting jamadar.-
 - a) Every locomotive or wagon in motion in a factory shall be in charge of a properly trained jamadar.
 - b) Before authorizing a locomotive or wagons to be moved, the shunting jamadar shall satisfy himself that no person is under or in between or in front of the locomotive or wagons.
- 13) Hand signals.- The hand signals used by the shunting jamadar by day and night shall be those prescribed by the shunting rules of railways, working under the Indian Railways Act, 1890(Central Act IX of 1890).
- 14) Night work and for.-
 - a) In factories where persons work at night, no movement of locomotive, wagon or other rolling stock otherwise than by hand shall be permitted between sunset and sunrise unless the tracks and their vicinity are lighted on a scale of not less than 10 lux as measured at the horizontal plane at the ground level.
 - b) In no circumstances shall any locomotive or train be moved between sunset and sunrise or at any time when there is fog, unless it carries a white head light and a red rear light.
- 15) Speed control.-
 - a) A locomotive or train shall not be permitted to move at a speed greater than seven kilometers per hour.
 - b) A train, locomotive, wagon or other rolling stock shall not be moved by mechanical or electrical power unless it is preceded at a distance of not less than 10 metres during the whole of its journey by a shunting jamadar. He shall be provided with signaling flags of lamp and whistle necessary for calling the attention of the driver.
- 16) Tracks.-
 - a) The distance (i) between tracks and (ii) between tracks and building, blind walls or other structures and (iii) tracks and materials deposited on the ground shall be respectively not less than:-
 - aa) from centre to centre of parallel tracks, the overall width of the widest wagon of that gauge plus twice the width of the door of such a wagon when opened directly outwards plus 1 metre.
 - bb) from a building or structure other than loading platform to the centre of the nearest track, half the overall width of the widest wagon of that gauge, plus the width of its door when opened outwards plus 1.5 metres.
 - cc) from material stocked or deposited alongside the track, on the ground or on a loading platforms, to the centre of the nearest track, half the overall width of the widest wagon of that gauge, plus half the width of its door when opened directly outward, plus 1 metre.
 - b) Sleepers of a track shall be in level with ground and at all crossings of the track with a road or walkway, the surface of the road or walkway shall be in level with the top of the rails.
 - c) All track ends shall be equipped with buffer stops of adequate strength.
 - d) Barriers of substantial construction shall be securely and permanently fixed across any doorway or gateway in a building or in a wall which

conceals an approaching train from view, between the building and the track as prescribed in clause (a) of sub-rule (3).

- e) Where tracks are carried on a gantry, or other elevation, a safe footway or footways with hand rails and toeboards shall be provided at all positions where persons work or pass on foot; and where there is an opening in the stage of an elevated track for dropping of material to a lower level, the position shall be adequately fenced or the opening itself provided with a grill through which a person cannot fall.
- f) All point leverds shall have their movements parralled to, not across, the direction of the track.
- g) All loading platforms which are more than 60 c.m. above the level of the ground on which the track is laid and more than 15 metres in length shall be provided with steps at intervals not greater than 15 metres apart to enable the platform to be easily mounted from the track.
- h) Turn tables on plant railways shall be provided with locking devices which will prevent the tables from turning while locomotives or wagons are being run on or off the tables.
- i) Workers shall be prohibited from passing under, between or above railway wagons.

17) Crossings.-

- a) At all crossings of a track with a road or walkway, danger or crossing signs and wherever reasonably practicable, blinking lights or alarm lights shall be provided. At all important crossings, gates or barriers manned by watchman shall be provided. Swinging gates and barriers shall be secured against inadvertent opening or closing.
- b) All crossing, warning, signs, gates and barriers shall be illuminated during hours of darkness.

18) Duties of drivers and shunters.- It shall be the duty of every driver of a locomotive or a shunter including a shunting jamadar, to report without delay to their superior any defect in permanent way locomotive or rolling stock.

19) Young persons not to be employed as drivers of locomotive or as shunters.- No person who is under 18 years of age and no person who is not sufficiently competent and reliable shall be employed as a driver of locomotive or as a shunter.

20) The Chief Inspector may by an order in writing exempt a factory or part of it from all or any of the provisions of this rule to such extent and on such conditions as he deems necessary.

Rule 98. Safety Committee.

1) In every factory-

- a) Wherein 250 or more workers are ordinarily employed, or
- b) Which carries on any process or operation declared to be dangerous under Section 87 of the Act; or
- c) Which carries on 'hazardous process' as defined under section 2(cb) of the Act;

There shall be a Safety Committee.

2) The representatives of the management on Safety Committee shall include-

- a) A senior official, who by his position in the organization can contribute effectively to the functioning of the Committee, shall be the Chairman;
- b) A Safety Officer and a Factory Medical Officer wherever available and the Safety Officer in such a case shall be the Secretary of the Committee;

- c) A representative each from the production, maintenance and purchase departments.
- 3) The workers representatives on this Committee shall be elected by the workers.
- 4) The tenure of the Committee shall be two years.
- 5) Safety Committee shall meet as often as necessary but at least once in every quarter. The minutes of the meeting shall be recorded and produced to the Inspector on demand.
- 6) Safety Committee shall have not right to be adequately and suitably informed of-
 - a) potential safety and health hazards to which the workers may be exposed at work-place;
 - b) data on accidents as well as data resulting from surveillance of the working environment and of the health of workers exposed to hazardous substances so far as the factory is concerned, provided that the committee undertakes to use data on a confidential basis and solely to provide guidance and advice on measures to improve the working environment and the health and safety of the workers.
- 7) Function and duties of the Safety Committee shall include-
 - a) assisting and cooperating with the management in achieving the aims and objectives outlined in the 'Health and Safety Policy' of the occupier;
 - b) dealing with all matters concerning health, safety and environment and to arrive at practicable solutions to problems encountered;
 - c) creating safety awareness amongst all workers;
 - d) undertaking educational, training and promotional activities.
 - e) discussing reports on safety, environmental and occupational health surveys, safety audits, risk assessment, emergency and disaster management plans and implementation of the recommendations made in the reports;
 - f) carrying out health and safety surveys and identifying causes of accidents;
 - g) looking into any complaint made on the likelihood of an imminent danger to the safety and health of the and workers and suggesting corrective measures; and
 - h) reviewing the implementation of the recommendations made by it.
- 8) Where owing to the size of the factory, or any other reason, the functions referred to in sub-rule (7) cannot be effectively carried out by the Safety Committee, it may establish sub-committee as may be required to assist it.

Rule 99. Site Appraisal Committee

(Rules prescribed under sec 4A sub-section (i) read with sec 112)

- 1) constitution: The following provisions shall govern the functioning of the Site Appraisal Committee, herein-after, be referred to as the "Committee", in these rules:-
 - a) The State Government may constitute a Site Appraisal Committee and reconstitute the Committee as and when necessary;
 - b) The State Government may appoint a senior official of the Factories Inspectorate to be the Secretary of the Committee;
 - c) The State Government may appoint the following as members of the committee:-
 - i) a representative of the Fire Service Organization of the State Government;
 - ii) A representative of the State Department of Industries;
 - iii) A representative of the Director General of Factory Advice Service and Labour Institutes, Bombay.

- 2) No member, unless required to do so by a Court of Law, shall disclose otherwise than in connection with the purpose of the Act, at any time any information relating to manufacturing or commercial business or any working process which may come to his knowledge during his tenure as a Member of this Committee.
- 3) Application for appraisal of sites.
 - a) Application for appraisal of sites in respect of the factories covered under section 2(cb) of the Act shall be submitted to the Chairman of the Site Appraisal Committee.
 - b) The application for site appraisal alongwith 15 copies thereof shall be submitted in the **Form 18A**. The committee may dispense with furnishing information on any particular item in the Application **Form 18A** if it considers the same to be not relevant to the application under consideration.
- 4) Function of the Committee-
 - a) The Secretary shall arrange to register the application received for appraisal of site in a separate register and acknowledge the same within a period of 7 days.
 - b) The Secretary shall fix up meeting in such a manner that all the applications received and registered are referred to the Committee within a period of one month from the date of their receipt.
 - c) The Committee may adopt a procedure for its working, keeping in view the need for expeditious disposal of applications.
 - d) The Committee shall examine the application for appraisal of a site with reference to the prohibitions and restrictions on the location of industry and the carrying on of processes and operations in different areas as per the provisions of Rule 5 of the Environment (Protection) Rules, 1986 framed under the Environment (Protection) Act, 1986.
 - e) The Committee may call for documents, examine experts, inspect the site if necessary and take other steps for formulating its views in regard to the suitability of the site.
 - f) Where the proposed site requires clearance by the Ministry of Industry or the Ministry of Environment and Forests, the application for Site Appraisal will be considered by the Site Appraisal Committee only after such clearance has been received.

Rule 100. Health and Safety Policy

- 1) The occupier of every factory, except as provided for in sub-rule (2), shall prepare a written statement of his policy in respect of health and safety of workers at work.
- 2) All factories-
 - a) covered under Section 2(m) (i) but employing less than 50 workers;
 - b) covered under Section 2 (m) (ii) but employing less than 100 workers; are exempted from requirement of sub-rule (1);

Provided that they are not covered under the First Schedule under Section 2 (cb) or carrying out processes or operations declared to be dangerous under Section 87 of the Act.
- 3) Notwithstanding anything contained in sub-rule (2), the Chief Inspector may require the occupiers of any of the factories or class or description of factories to comply with the requirements of sub rule (1), if, in his opinion, it is expedient to do so.
- 4) The Health and Safety Policy should contain or deal with;

- a) declared intention and commitment of the top management to health, safety and environment and compliance with all the relevant statutory requirements;
 - b) organizational set-up to carry out the declared policy clearly assigning the responsibility at different levels; and
 - c) arrangements for making the policy effective.
- 5) In particular, the Policy should specify the following;
 - a) arrangements for involving the workers;
 - b) intention of taking into account the health and safety performance of individuals at different levels while considering their career advancement;
 - c) fixing the responsibility of the contractors, subcontractors transporters and other agencies entering the premises;
 - d) providing a resume of health and safety performance of the factory in its Annual Report;
 - e) relevant technique and methods, such as safety audits and risk assessment for periodical assessment of the status on health, safety and environment and taking all the remedial measures;
 - f) stating its intentions to integrate health and safety, in all decisions including those dealing with purchase of plant, equipment, machinery and material as well as selection and placement of personnel;
 - g) arrangements for informing, educating and training and retraining its own employees at different levels and the public, wherever required.
- 6) A copy of the declared Health and Safety Policy signed by the occupier shall be made available to the Inspector having jurisdiction over the factory and to the Chief Inspector;
- 7) The policy shall be made widely known by-
 - a) making copies available to all workers including contract workers, apprentices, transport workers, suppliers, etc.
 - b) displaying copies of the policy at conspicuous places; and
 - c) any other means of communication; in a language understood by majority of workers.
- 8) The occupier shall revise the Safety Policy as often as may be appropriate, but it shall necessarily be revised under the following circumstances:-
 - a) whenever any expansion or modification having implications on safety and health of persons at work is made; or
 - b) whenever new substance(s) or articles are introduced in the manufacturing process having implications on health and safety of persons exposed to such substances.

Rule 101. Collection and Development And Dissemination of Information (Rules made under Sec 41B and 112, Material Safety Data Sheet)

- 1) The occupier of every factory carrying on a hazardous process shall arrange to obtain or develop information in the form of Material Safety Data Sheet (MSDS) in respect of every hazardous substance or material handled in the manufacture, transportation and storage in the factory. It shall be accessible upon request to a worker for reference.
 - a) Every such Material Safety Data Sheet shall include the following information:-
 - i) The identity used on the label;
 - ii) Hazardous ingredients of the substance;
 - iii) Physical and chemical characteristics of the hazardous substance;
 - iv) The physical hazards of the hazardous substance including the

- potential for fire, explosion and reactivity.
- v) The health hazards of the hazardous substance, including the potential for fire, explosion and reactivity;
 - vi) The primary route(s) of entry;
 - vii) The permissible limits of exposure prescribed in the Second Schedule under Section 41-F of the Act, and in respect of a Chemical not covered by the said Schedule, any exposure limit used or recommended by the manufacturer, importer or occupier;
 - viii) Any generally applicable precautions for safe handling and use of the hazardous substance, which are known, including appropriate hygienic practices, protective measures during repairs and maintenance of contaminated equipment, procedures for clean-up of spills and leaks;
 - ix) Any generally applicable control measures, such as appropriate engineering controls, work practices, or use of personal protective equipment;
 - x) Emergency and first aid procedures;
 - xi) The date of preparation of the Material Safety Data Sheet, or the last change to it; and
 - xii) The name, address and telephone number of the manufacturer, importer, occupier or other responsible party preparing or distributing and Material Safety Data Sheet, who can provide additional information on the hazardous substance and appropriate emergency procedures, if necessary.
- b) The occupier while obtaining or developing a Material Safety Data sheet in respect of a hazardous substance shall ensure that the information recorded accurately reflects the scientific evidence used in making the hazard determination. If he becomes newly aware of any significant information regarding the hazards of a substance, or ways to protect against the hazards, this new information shall be added to the Material Safety Data Sheet as soon as practicable.

Labelling

- 2) Every container of a hazardous substance shall be clearly labeled or marked to identify;
- a) the contents of the container;
 - b) the name and address of the manufacturer or importer of the hazardous substances;
 - c) the physical and health hazards; and
 - d) the recommended personal protective equipment needed to work safely with the hazardous substance.

SCHEDULE

<p>MATERIAL SAFETY DATA SHEET SAMPLE MODEL SECTION I : MATERIAL IDENTIFICATION</p>

<p>Material Name/Identifier</p>

Manufacturer's Name		Supplier's Name	
Street Address		Street Address	
City	State	City	State
		Postal Code	Emergency Telephone No.
Chemical Name	Chemical Identity		
Trade Name and Synonyms		Product use	

Section II

HAZARDOUS INGREDIENTS OF MATERIAL

Hazardous Ingredients	Approximate Concentration %	CAS or UN Numbers	LD 50 (Specify species and Route)	LC 50 (Specify species and Route)

SECTION III - PHYSICAL DATA FOR MATERIAL

Physical State -Gas - Liquid - Solid	Odour and Appearance,	Odour Threshold (p.p.m.)	Specific Gravity Freezing (oC)	
Vapour Pressure (mm)	Vapour density (Air=1)	Evaporation Rate	Boiling Point (oC)	F
Solubility in Water (20C)	PH	Density (g/ml)	Coefficient of water/oil distribution	

SECTION IV FIRE AND EXPLOSION HAZARD OF MATERIAL

Flammability

_____ yes _____ No. If yes, under what conditions

Means of Extinction

Special Procedure

Flash point (0 C) and	Under Explosion Limit	Lower Explosion Limit
-----------------------	-----------------------	-----------------------

Method	(%by Volume)	(%by Volume)
Auto-ignition Temperature(90C)	TDG Flammability Classification	Hazardous Combustion Products
Explosion Impact	Date-Sensitivity Chemical	Sensitivity to Static Discharge.

SECTION V - REACTIVITY DATA

Chemical Stability

-----yes ----- No

If no under what conditions

Incompatibility to other substances

-----yes ----- No.

If yes, which ones

Reactivity and under what conditions

Hazardous Decomposition Products

Material

Name/Identifier

SECTION VI - TOXICOLOGICAL PROPERTIES OF MATERIAL

Route of Entry

_____ Skin Contact _____ Skin Absorption _____ Eye Contact
 _____ inhalation Acute _____ Inhalation Chronic _____ Ingestion

Effect of Acute Exposure to Material

Effect of Chronic Exposure to Material

Exposure Limit(s)	Irritancy of Material
-------------------	-----------------------

Sensitisation to Material	Carcinogenicity, Reproductive Effects, Teratogenicity, Mutagenicity
---------------------------	---------------------------------------------------------------------

SECTION VII - PREVENTIVE MEASURES

Personal Protective Equipment

Gloves (Specify)	Respiratory (Specify)	Eyes (Specify)
Footwear (Specify)	Clothing (Specify)	Other (Specify)

Engineering Controls (e.g. ventilation, enclosed process, etc) please Specify.

Leak and Spill Procedures

Waste Disposal

Handling Procedures and Equipment

Storage Requirements

Special Shipping Information

SECTION VIII - FIRST AID MEASURE

Sources used

Additional information

SECTION IX - PREPARATION DATE OF M S D S

Prepared by (Group, Department, etc) (Phone No.) Date

Rule 102. Disclosure Of Information Of Workers

- 1) The occupier of a factory carrying on a 'hazardous process' shall supply to all workers the following information in relation to handling of hazardous materials or substances in the manufacture, transportation, storage and other processes;
 - a) Requirements of Sections 41B, 41C and 41H of the Act.
 - b) A list of 'hazardous process' carried on in the factory;
 - c) Location and availability of all Material Safety Data Sheets as per Rule 101.
 - d) Physical and health hazards arising from the exposure to or handling of substances;
 - e) Measures taken by the occupier to ensure safety and control of physical and health hazards;
 - f) Measures to be taken by the workers to ensure safe handling, storage and transportation of hazardous substances;
 - g) Personal Protective Equipment required to be used by workers employed in 'hazardous process' or 'dangerous operations';
 - h) Meaning of various labels and markings used on the containers of hazardous substances as provided under **Rule 101**;
 - i) Signs and symptoms likely to be manifested on exposure to hazardous substances and to whom to report;
 - j) Measures to be taken by the workers in case of any spillage or leakage of a hazardous substance;
 - k) Role of workers vis-à-vis the emergency plan of the factory, in particular the evacuation procedures.
 - 1) Any other information considered necessary by the occupier to ensure safety and health of workers.
- 2) The information required by sub-rule (1) shall be compiled and made known to workers individually through supply of booklets or leaflets and display of cautionary notices at the work places.
- 3) The booklets, leaflets and the cautionary notices displayed in the factory shall be in the language understood by the majority of the workers and also explained to them.
- 4) The Chief Inspector may direct the occupier to supply further information to the workers as deemed necessary.

Rule 103. Disclosure of Information to the Chief Inspector

- 1) The occupier of every factory carrying on 'hazardous process' shall furnish, in writing, to the Chief Inspector, a copy of all the information furnished to the workers.
- 2) A copy of compilation of Material Safety Data Sheets in respect of hazardous substances used, produced or stored in the factory shall be furnished to the Chief Inspector, and the local inspector.
- 3) The occupier shall also furnish any other information asked for by the Chief Inspector from time to time for the purpose of the Act and Rules made thereunder.

Rule 104. Information on Industrial Wastes

- 1) The information furnished under Rule 102 and 103 shall include the quantity of the solid and liquid wastes generated per day, their characteristics and the method of treatment such as incineration of solid wastes, chemical and biological treatment of liquid wastes, and arrangements for their final disposal.
- 2) It shall also include information on the quality and quantity of gaseous waste discharged through the stacks or other openings, and arrangements such as provision of scrubbers, cyclone separators, electro-static precipitators or similar such arrangements made for controlling pollution of the environment.
- 3) The occupier shall also furnish the information prescribed in the sub-rules (1) and (2) to the State Pollution Control Board.

Rule 105. Review Of The Information Furnished To Workers Etc.

- 1) The occupier shall review once in every calendar year and modify, if necessary, the information furnished under Rule 102 and 103 to the workers and the Chief Inspector.
- 2) In the event of any change in the process or operations or methods of work or when any new substance is introduced in the process or in the event of a serious accident taking place, the information so furnished shall be reviewed and modified to the extent necessary.

Rule 106. Confidentiality of Information

The occupier of a factory carrying on 'hazardous process' shall disclose all information needed for protecting safety and health of the workers to-

- a) his workers and
- b) Chief Inspector.

as required under Rule 102 and 103. If the occupier is of the opinion that the disclosure of details regarding the process and formulations will adversely affect his business interests, he may make a representation to the Chief Inspector shall give an opportunity to the occupier of being heard and pass an order to the representation. An occupier aggrieved by an order of Chief Inspector may prefer an appeal before the State Government within a period of 30 days. The State Government shall give an opportunity to the occupier of being heard and pass an order. The order of the State Government shall be final.

Rule 107. Medical Examination

Rules framed under Section 41-B, 41-C and 112-Specified responsibility of the occupier in relation to hazardous process.

- 1) Workers employed in "hazardous process" shall be medically examined by a qualified medical practitioner hereinafter referred to as Factory Medical Officer, in the following manner:-
 - a) Once before employment, to ascertain physical fitness of the person to the particular job;

- b) Once in a period of 6 months, to ascertain the health status of all the workers in respect of occupational health hazards to which they are exposed; and in cases where in the opinion of the Factory Medical Officer it is necessary to do so at a shorter interval in respect of any workers.
 - c) The details of pre-employment and periodical medical examination carried out as aforesaid shall be recorded in the Health Register in **Form 29**.
- 2) No person shall be employed for the first time without a certificate of Fitness in **Form 28** granted by the Factory Medical Officer. If the Factory Medical Officer declares a person unfit for being employed in any process covered under sub-rule(1), such a person shall have the right to appeal to the Inspector who shall refer the matter to the Certifying Surgeon whose opinion shall be final in this regard. If the Inspector is also a Certifying surgeon, he may dispose of the application himself.
- 3) Any findings of the Factory Medical Officer revealing any abnormality or unsuitability of any person employed in the process shall immediately be reported to the Certifying surgeon who shall in turn, examine the concerned worker and communicate his findings to the occupier within 30 days. If the Certifying Surgeon is of the opinion that the worker so examined is required to be taken away from the process for health protection, he will direct the occupier accordingly, who shall not employ the said worker in the same process. However, the worker so taken away shall be provided with alternate placement unless he is in the opinion of the Certifying Surgeon, fully incapacitated in which case the worker affected shall be suitably rehabilitated.
- 4) A certifying Surgeon on his own motion or on a reference from an Inspector may conduct medical examination of a worker to ascertain the suitability of his employment in a hazardous process or for ascertaining his health status. The opinion of the Certifying Surgeon in such a case shall be final. The fee required for this medical examination shall be paid by the occupier.
- 5) The worker taken away from employment in any process under sub- rule (2) may be employed again in the same process only after obtaining the Fitness Certificate from the Certifying Surgeon and after making entries to that effect in the Health Register.
- 6) The worker required to undergo medical examination under these rules and for any medical survey conducted by or on behalf of the Central or the State Government shall not refuse to undergo such medical examination.

Rule 108. Occupational Health Centres

- 1) In respect of any factory carrying on 'hazardous process' there shall be provided and maintained in good order and Occupational Health Centre with the services and facilities as per scale laid down hereunder:-
 - a) For factories employing upto 50 workers -
 - i) the services of a Factory Medical Officer on retainer-ship basis, in his clinic to be notified by the occupier. He will carry out the pre-employment and periodical medical examination as stipulated in rule 107 and render medical assistance during any emergency.
 - ii) a minimum of 5 persons trained in first-aid procedures amongst whom at least one shall always be available during the working period;
 - iii) a fully equipped first-aid box.
 - b) For factories employing 51 to 200 workers -
 - i) An Occupational Health Centre having a room with a minimum floor area of 15 sq.m. with floors and walls made of smooth and

- impervious surface and with adequate illumination and ventilation as well as equipment as per the schedule annexed to this Rule.
 - ii) a part-time Factory Medical Officer shall be in over all charge of the Centre who shall visit the factory at least twice in a week and whose services shall be readily available during medical emergencies;
 - iii) one qualified and trained dresser-cum-compounder on duty throughout the working period;
 - iv) a fully equipped first aid box in all the departments;
 - c) For factories employing above 200 workers;
 - i) One full-time Factory Medical Officer for factories employing upto 500 workers and one more Medical Officer for every additional 1000 workers or part thereof;
 - ii) an Occupational Health Centre having at least 2 rooms each with a minimum floor area of 15 sq. metre with floors and walls made of smooth and impervious surface and adequate illumination and ventilation as well as equipment as per the schedule annexed to this Rule.
 - iii) there shall be one nurse, one dresser-cum-compounder and one sweeper-cum-ward boy through-out the working period.
 - iv) the Occupational Health Centre shall be suitably equipped to manage medical emergencies.
 - 2) The Factory Medical Officer required to be appointed under sub-rule (1) shall have qualifications included in Schedule to the Indian Medical Degree Act of 1916 or in the Schedules to the Indian Medical Council Act, 1956 and posses a Certificate of Training in Industrial Health of minimum three months duration recognised by the State Government;
- Provided that-
- i) person possessing a Diploma in Industrial Health or equivalent shall not be required to possess the certificate of training as aforesaid;
 - ii) the Chief Inspector may, subject to such conditions as he may specify, grant exemption from the requirement of this sub-rule, if in his opinion a suitable person possessing the necessary qualification is not available for appointment;
 - iii) in case of a person who has been working as a Factory Medical Officer for a period of not less than 3 years on the date of commencement of this rule, the Chief Inspector may, subject to the condition that the said person shall obtain the aforesaid certificate of training within a period of three years, relax the qualification.
 - 3) The syllabus of the course leading to the above certificate, and the organisations conducting the Course shall be approved by the Directorate General of Factory Advice Service and Labour Institutes or the State Government in accordance with the guidelines issued by the DGFASLI.
 - 4) Within one month of the appointment of Factory Medical Officer, the occupier of the Factory shall furnish to the Chief Inspector the following particulars-
 - a) Name and address of the Factory Medical Officer;
 - b) Qualifications
 - c) Experience, if any, and
 - d) the sub-rule under which appointed.

SCHEDULE

Equipment for Occupational Health Centre in Factories

1. A glazed sink with hot and cold water always available.

2. A table with a smooth top at least 180 cm × 105 cm.
3. Means for sterilizing instruments
4. A couch
5. Two buckets or containers with close fitting lids
6. A kettle and spirit stove or other suitable means of boiling water.
7. One bottle of spiritus ammoniac aromaticus (120ml.)
8. Two medium size sponges
9. Two 'kidney' trays
10. Four cakes of toilet preferably antiseptic soap
11. Two glass tumblers and two wine glasses
12. Two clinical thermometers
13. Two tea spoons
14. Two graduated (120 ml) measuring glasses
15. One wash bottle (1000 cc) for washing eyes
16. One bottle (one litre) carbolic lotion 1 to 20
17. Three chairs
18. One screen
19. One electric heater.
20. An adequate supply of tetanus toxoid
21. Coramine liquid (60 ml)
22. Tablets-antihistaminic, antispasmodic (25 each)
23. Syringes with needles - 2 cc, 5 cc and 10 cc
24. Two needle holders, big and small
25. Suturing needles and materials
26. One dissecting forceps
27. One dressing forceps
28. One scalpels
29. One stethoscope
30. Rubber bandage-pressure bandage
31. Oxygen cylinder with necessary attachments
32. One blood pressure apparatus
33. One patellar Hammer
34. One peak-flow meter for lung function measurement
35. One Stomach wash set
36. Any other equipment recommended by the Factory Medical Officer according to specific need relating to manufacturing process
37. In addition-
 - 1) For factories employing 51 to 200 workers-
 1. Four plain wooden splints 900 mm × 100 mm × 6 mm.
 2. Four plain wooden splints 350 mm × 75 mm × 6 mm.
 3. Two plain wooden splints 250 mm × 50 mm × 12 mm.
 4. One pair artery forceps
 5. Injections- morphia, pethidine, atropine, adrenaline, coramine, novacan (2 each)
 6. One surgical scissors
 - 2) For factories employing above 200 workers
 1. Eight plain wooden splints 900 mm × 100 mm × 6mm.
 2. Eight plain wooden splints 350 mm × 75 mm × 6mm.
 3. Four plain wooden splints 250 mm × 50 mm 12 mm
 4. Two pairs artery forceps
 5. Injections - morphia, pethidine, atropine, adrenaline, coramine, novacan (4 each)

6. Two surgical scissors

Rule 109. Ambulance Van

1) In any factory carrying on 'hazardous process' there shall be provided and maintained in good condition, a suitably constructed ambulance van equipped with items as per sub-rule (2) and manned by a full-time Driver-cum-Mechanic and a Helper trained in first-aid, for the purpose of transportation of serious cases of accidents or sickness. The ambulance van shall not be used for any purpose other than the purpose stipulated herein and will normally be stationed at or near to the Occupational Health Centre; Provided that a factory employing less than 200 workers may make arrangements for procuring such facility at short notice from a nearby hospital or other places, to meet any emergency.

2) The Ambulance should have the following equipment

- a) General
 - A wheeled stretcher with folding and adjusting devices; with the head of the stretcher capable of being tilted upward;
 - Fixed suction unit with equipment;
 - Fixed oxygen supply with equipment;
 - Pillow with case; -Sheets; -Blankets; -Towels;
 - Emesis bag; -Bed pan; -Urinal pan; -Glass
- b) Safety equipment
 - Flares with life of 30 minutes; - Flood lights;
 - Flash lights; -Fire extinguisher dry powder type;
 - Insulated gauntlets
- c) Emergency Care Equipment
 - i) Resuscitation
 - Portable suction unit; Portable oxygen units;
 - Bag-valve-mask, hand operated artificial ventilation unit;
 - Airways; -Mouth gags; -Tracheostomy adapters;
 - Short spine board; -I.V. Fluids with administration unit;
 - B.P. Manometer; -Cuff; -Stethoscope
 - ii) Immobilization
 - Long and short padded boards; - wire ladder splints;
 - Triangular bandage; - Long and short spine boards
 - iii) Dressings
 - Gauze pads -4" × 4" ; -Universal dressing 10" × 36";
 - Roll of aluminium foils; - Soft roller bandages 6" × 5 yards;
 - Adhesive tape in 3" roll; - Safety pins;
 - Bandage sheets; -Burn sheet;
 - iv) Poisoning
 - Syrup of Ipecac; -Activated Charcoal Pre packeted in doses; snake bite kit;
 - v) Emergency Medicines
 - As per requirement (under the advice of Medical Officer only)

Rule 110. Decontamination Facilities

In every factory, carrying out 'hazardous process' , the following provisions shall be made to meet emergency:-

- a) fully equipped first aid box;
- b) readily accessible means of water for washing by workers as well as for drenching the clothing of workers who have been contaminated with hazardous and

corrosive substance; and such means shall be as per the scale shown in the Table below-

TABLE

No. of persons employed at any time	No. of drenching showers
i) Upto 50 workers	2
ii) Between 51 to 200 Workers	2 + 1 for every additional 50 or part thereof.
iii) Between 201 to 500 workers	5 + 1 for every additional 100 or part thereof
iv) 501 workers and above.	8 + 1 for every additional 200 or part thereof.

c) a sufficient number of eye wash bottles filled with distilled water or suitable liquid, kept in boxes or cupboards conveniently situated and clearly indicated by a distinctive sign which shall be visible at all times.

Rule 111. Making Available Health Records To Workers

- 1) The occupier of every factory carrying out a 'hazardous process' shall make accessible the health records including the record of worker's exposure to hazardous process or, as the case may be, the medical records of any worker for his perusal under the following conditions:-
 - a) Once in every six months or immediately after the medical examination whichever is earlier;
 - b) If the Factory Medical Officer or the Certifying Surgeon as the case may be, is of the opinion that the worker has manifested signs and symptoms of any notifiable disease as manifested signs and symptoms of any notifiable disease as specified in the Third Schedule of the Act;
 - c) If the worker leaves the employment;
 - d) If any one of the following authorities so direct
 - the Chief Inspector of Factories;
 - the Health Authority of the Central or State Government;
 - Commissioner of Workmen's Compensation;
 - the Director General, Employees State Insurance Corporation;
 - the Director General, Factory Advice Service and Labour Institutes.
- 2) A copy of the upto date health records including the record of worker's exposure to hazardous process or, as the case may, the medical records shall be supplied to the worker on receipt of an application from him. X-ray plates and other medical diagnostic reports may also be made available for reference to his medical practitioner.

Rule 112. Qualifications etc. of Supervisors

- 1) All persons who are required to supervise the handling of hazardous substances shall possess the following qualifications and experience:
 - a) i) A degree in Chemistry or Diploma in Chemical Engineering or Technology with 5 years experience; or
 - ii) A Master's Degree in Chemistry or a Degree in Chemical Engineering or Technology with 2 years experience.

The experience stipulated above shall be in process operation and maintenance in the Chemical Industry.

- b) The Chief Inspector may require the supervisor to undergo training in Health and Safety.
- 2) The syllabus and duration of the above training and the organisations conducting the training shall be approved by the DSFASLI or the State Government in accordance with the guidelines issued by the DGFASLI.

Rule 113. Issue Of Guidelines

For the purpose of compliance with the requirements of sub-sections (1) (4) and (7) of Section 41-B or 41-C the Chief Inspector may, if deemed necessary, issue guidelines from time to time to the occupiers of factories carrying on 'hazardous process'. Such guidelines may be based on National Standards, Codes of Practice, or recommendations of International Bodies such as ILO and WHO.

Rule 114. Quality of personal protective equipment.

All personal protective equipments provided to workers as required under any of the provisions of the Act, or the rules shall have certification by Indian Standard Institute.

Rule 115. Protective equipment.

The Inspector may, having regard to the nature of the hazards involved in work and process carried out, order the Occupier or the Manager in writing to supply to the workers exposed to particular hazard any personal protective equipment as may be found necessary.

Rule 116. Thermic Fluid Heaters:-

- 1) All heaters shall be of such construction that coils are removable for periodic cleaning, visual inspection and hydraulic test.
- 2) Suitable arrangements shall be made for cooling the furnace effectively in case of power failure.
- 3) Before restarting the furnace, it shall be effectively purged.
- 4) Velocity of flow of the thermic fluid shall not be allowed to fall below the minimum recommended by the manufacturers while the heater is in operation.
- 5) The thermic fluid shall be circulated in closed circuit formation with an expansion-cum-deairator tank. This tank shall be located outside the shed where the heater is installed.
- 6) Every heater shall be provided with a photo-register actuated audio-visual alarm to indicate flame failure and automatic burner cut off.
- 7) The stack temperature monitor-cum-controller with audiovisual alarm shall be provided so as to warn the operator in case the outlet temperature exceeds the specified minimum.
- 8) Where inspection doors are provided on the furnace they shall be inter-locked with the burner itself so that they cannot be opened until burner is shut off and furnace is cooled sufficiently.
- 9) All heaters shall also be provided with the following safety devices:-
 - i) Level control in the expansion tank;
 - ii) Temperature control of thermic fluid;
 - iii) differential pressure switch on the outlet line of the heater tubes; and
 - iv) temperature control device for the fuel oil supply to the burner.

- 10) All devices mentioned in paragraph (9) shall have interlocking arrangement with burner so that in case of any predetermined limits being crossed the supply of fuel and air to burner shall automatically be cut-off.
- 11) All safety interlocks when operated shall be indicated on the control panel of the heater by a suitable audio-visual alarm.
- 12) Every heater unit shall be provided as a standard accessory and arrangement for sniffing with low pressure steam or nitrogen for putting out the fire.
- 13) Electric panel for the heater shall be located near the heater but not so close as to be exposed to spilling or leakage oil.
- 14) The heater shall be located in a place partitioned off with fire proof material from other manufacturing activities.
- 15) Explosion vent shall be so installed that release takes place at safe location.
- 16) The heater coil shall be subjected to pressure test by competent person once atleast in every 12 months. The test pressure shall not be less than twice the operating pressure.
- 17) If repairs are carried out to the coil, it shall be tested before taking it into use.
- 18) The thermic fluid shall conform to the specifications prescribed by the manufacturers and shall be tested by competent person for suitability atleast once in every three months period. Such test shall include test for acidity, suspended matter, ash contents, viscosity and flash point.
- 19) Cleaning of internal surface of the heater or soot and check up of refractory surface on the inside shall be carried out every month or as often as required depending upon working conditions. The coils shall be removed and surface of the coils cleaned thoroughly once at least in a period of six months. The burner, nozzles oil filters and pumps shall be cleaned once a week during the periods of use.
- 20) A separate register containing the following information shall be maintained:-
 - i) weekly checks carried out confirming the effectiveness of the interlock,
 - ii) weekly checks confirming that all accessories are in good state of repairs, and
 - iii) information regarding fuel oil temperature, pressure, thermic fluid inlet/outlet pressure and temperature, fuel gas temperature, recorded at four hourly interval.
- 21) The heater when in operation shall always be kept in charge of a trained operator.