

 GOVERNMENT OF DUBAI	<b>Organization Unit</b> <b>Public Health &amp; Safety Department</b>	الوحدة التنظيمية:	 بلدية دبي DUBAI MUNICIPALITY	
	<b>Form sheet title:</b>	<b>Guidelines for Guarding of Dagerous Machinery</b>		اسم النموذج :
	<b>Doc Ref.</b>	<b>DM-PH&amp;SD-P4-TG06</b>		رقم النموذج :

## Guarding of Dangerous Machinery

**Background:** Accident statistics show that nearly one-third of accidents in factories are due to machinery whether it is moved by power or operated manually. To safer guard workers who operate and maintain machines, it is necessary to make the machine safe. A machinery guard is a barrier or device to prevent a person or his clothing coming in contact with the dangerous parts of machinery. In the first instant, guards shall be provided by the manufacturers of machines failing which the occupier/employer shall provide necessary safe guards for use in factories. The management while selecting purchasing, installing and making use of machinery and equipment should ensure that they are safe. Proper inspection of a machine should be done to identify the dangerous parts of machines requiring guards. This guideline covers certain machines requiring guards to dangerous parts viz. point of operation, transmission machinery or other dangerous parts. Dubai Occupational Health and Safety Regulation Local Order No. 61 of 1991 require the employer to ensure that the working conditions are safe and the precautions are taken for the protection of workers. Also, it requires the person who supplies plant and machinery to ensure that they are in good condition.

### **Guidelines:**

#### **1. Guarding of Machinery**

- i. All moving parts of machinery and equipment shall be guarded effectively, preventing persons from coming in contact with them. These could pose punching, trapping, crushing or pulling hazards.
- ii. The hazards may be created by:
  - a. The point of operation - area on a machine where material is positioned for processing or change by the machine. e.g. cutting, pressing, turning, grinding operation.
  - b. Power transmission - All mechanical components including gears, cams, shafts, pulleys, belts which transmit energy and motion from the source of power. e.g. belt drives, gear drives, shafts, pulleys, etc.
  - c. In-running nip points or bites - Two or more mechanical components such as gears or rolls rotating in opposite direction

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in close interaction or meshing, e.g. gear meshing, rolls in calendering machine, sheet rolling machines.

- d. Shear points - Reciprocal (sliding) movement of a blade or component past a stationary point on machine, e.g. guillotine shearing, cutting operations.
- e. Flying chips and sparks
  - i. Flying fragments due to operation and bursting
  - ii. Sparks generated during operation of equipment  
e.g. - Grinding/buffing operation  
grinding wheel bursting

## 2. Type of Guards

- i. The appropriate types of enclosures shall be selected based on the type of physical hazard involved.
- ii. Details on guard for different machines may be obtained from the Public Health and Safety Departmental.

## 3. Guards shall be maintained and kept in position while the machinery is in use.

## 4. Additional safety guards for common machinery types

### A. Circular Saw

- i. The part of the saw blade which is below the machine table shall be guarded.
- ii. Every circular sawing machine used in wood working shall be provided with a riving knife (spreader).
- iii. The crown of saw blade above the machine table shall be provided with an adjustable guard, allowing free movement of material.
- iv. A push stick shall be provided for use to enable the work to be pushed towards the saw blade without risk of hands coming in contact with the saw blade.
- v. Any person engaged in removing the cut material while the saw blade is in motion shall stand at the delivery end of the machine.

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### **B. Band saw machines**

Every band saw shall be guarded as follows:

- i. Both sides of the pulleys/wheels of horizontal/vertical band saw machines shall be completely encased by sheet or expanded metal.
- ii. All portions of the blade shall be enclosed except:
  - a. the portion of the blade between the bench table and the top guide of vertical band saw machine.
  - b. the lower portion of the blade between the pulleys/wheels for sawing the wood/log on a trolley on rail.

### **C. Planing Machines (wood working)**

- i. Every planing machine for surfacing shall be provided with a bridge guard capable of covering the full length and breadth of the cutting slot in the bench.
- ii. The guard shall be adjusted so as to avoid injuries.
- iii. When short pieces of stock are planned, push sticks or blocks with handles shall be used to control the material.

### **D. Revolving Machinery**

- i. The safe working peripheral speed of every revolving cage, vessel, basket, flywheel, pulley, disc or wheel or similar appliance driven by power specified by the manufacturer shall not be exceeded.
- ii. Polishing and grinding machinery
  - a. Shafts, pulleys and belts in polishing and grinding machines shall be effectively guarded.
  - b. Grinding wheels shall not be operated at a speed in excess of that which is recommended by the manufacturer.
  - c.
    - Defective wheels shall not be used.
    - Grinding wheels shall be kept as true as practicable, and the work rest shall be kept adjusted close to wheels, leaving a maximum gap of 6 mm.

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- Energy or abrasive wheels shall be provided with a sheet metal guard that shall enclose the wheel as far as possible to retain fragments in the event of bursting. The guard shall be securely attached to the frame of the machine or solid foundation.
- d. Centrifugal machines/extractors.
  - i. Centrifugal machines shall be provided with interlocking devices that will:
    - a. Physically prevent the lids from being opened whilst the rotating drums or baskets are in motion.
    - b. Prevent the starting of the drums or baskets under power while lids are open. The above requirements shall not apply while charging, ploughing and discharging operations are carried out when the drums or the baskets are rotated at a lower speed.
  - ii. Centrifugal machines shall not be operated at a speed in excess of manufacturer's rating which shall be legibly stamped by the manufacturer.
  - iii. All centrifugal machine shall be provided with effective braking arrangements for bringing the cage/drum or basket to a rest within a reasonable short period of time after the power to drive the motor is cut off.
  - iv. The cages, drums or baskets shall be thoroughly examined by a competent person once in every 12 months to check their balance. In case balance at high speed is not observed, effective steps shall be taken to restore their balance before re-commissioning the machine.

#### ***E. Power Presses***

- i. 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.

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- ii. Protection of tool die:
  - a. Each press shall be provided with a fixed guard enclosing the front and all sides of the tool/die.
  - b. The guard design shall prevent the possibility of a worker's hand or fingers reaching the danger zone.
  - c. An automatic guard or interlocking guard may be used in place of fixed guard.
  - d. If other types of guards are not suitable, two hand control to keep both hands of the operator engaged away from the danger zone may be provided to the power press. But this arrangement may not be safe for a person other than the operator.
  - e. Photo-electric guard may be installed to provide a light curtain across the danger zone. If the light curtain is interrupted, the machine should come to a stop.

#### ***F. Rubber Mill Rolls***

- i. Rolls of rubber mills shall be located in such a way that it is impossible for the operator to come in contact with the nip of the rolls.
- ii. Horizontal safety trip rods or tight wire cables, across both front and rear, which when pulled or pushed, operate instantly to disconnect the power and apply the brakes or to reverse the rolls.

#### ***G. Shears, Guillotine Machines***

- i. A barrier metal guard at the front of the blade/knife, fastened to the machine frame shall be fixed to prevent any part of operator's body reaching the descending blade from above, below, sides or through the barrier guard.
- ii. 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 to prevent a person at the back from reaching the descending blade.
- iii. Power driven guillotine cutters shall be equipped with additional devices such as:

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- a. Two hand controls;
  - b. 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 mechanism.
  - c. Where two or more workers are employed at the same time on the same power driven guillotine shear equipped with two hand control, the devices shall be so arranged that each worker shall be required to use both hands simultaneously to operate the machine.
- iv. A machine used to the paper printing and allied industry for cutting papers, where a fixed guard is not suitable on account of the height and volume of the material being fed, shall be provided with:
- a. Suitable starting devices with two hand controls engaging both hands of operations; or
  - b. An automatic device which will remove both the hands of the operator from the danger zone at every descent of the blade.
- v. a. Circular disc-type knives on machines for cutting metal, leather, paper or other material shall be provided with guards enclosing the knife edges.
- b. The guard shall be adjusted so that the gap between the bottom of the guard and material is not to exceed 6 mm.
  - c. The portion of the blade underneath the table or bench of the machine shall be covered by a guard.

#### **H. Self Acting Machine**

Self acting machines shall be installed leaving a minimum distance of 45 cms. From any fixed structure which is not part of the machine, to prevent any person getting trapped in outward or inward traverse of the machine.

#### **I Calendars/Rolling Machines**

- i. 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

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to prevent the fingers of the workers from being pulled in between the rolls or between the guard and the rolls.

- ii. The guard should be placed to allow the sheet metal or cloth to be fed into rolls safely.

#### ***J. Incidental Safety Devices /Actions***

A large number of machinery accidents can be avoided by the use of incidental safety devices. These safety devices are not guards but they help to do certain operations without any chance of part of the body coming in contact with the moving parts.

- i. Use of tongs and vacuum feeding devices for power presses.
- ii. Emergency stops - red colour coded push buttons.
- iii. Other factors:
  - a. Use of safe working clothing and personal protective equipment.
  - b. Avoidance of rings and jewelry
  - c. Preventing long hair coming in contact with moving parts.
  - d. Good maintenance of machines and guards.
  - e. Proper training of workers in safe machine operation.

**FURTHER INFORMATION IS AVAILABLE FROM  
PUBLIC HEALTH AND SAFETY DEPARTMENT  
Tel: 2064244/ 2064282 FAX: 2270160**