

## GOVERNMENT OF MAHARASHTRA

No.MFS/10/2014/1313

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**Directorate of Maharashtra Fire Service**

Maharashtra Fire Service Academy,

Vidyanagari, Hans Bhugra Marg,

Santacruz (East), Mumbai-400 098.

Date : 10<sup>th</sup> September 2014.

### **OFFICE ORDER**

**Sub : Judicious requirements to be provided for the Fire Prevention and Life Safety Measures keeping the public safety and fire safety of the occupants in Industrial occupancies.**

**Ref : This Directorate's Office Order No.876/MFS, dated 11.10.2010**

The Maharashtra Fire Prevention and Life Safety Measures Act, 2006 (Fire Act) is in force in the State of Maharashtra w.e.f. 06.12.2008. As per Section 3 of the Fire Act, the provisions prescribed in the National Building Code, 2005 are mandatory. The Schedule I of the Fire Act is borrowed from the National Building Code of India, 2005. In view of the various representations made by the owners of small scale industries and occupiers and repeated requests from the various industries associations, Chamber of Commerce and Industries, Udyog Mitra, it has been brought to the notice of this Directorate by various planning authorities such as municipal corporations and in particular Maharashtra Industrial Development Corporation (MIDC), being a special planning authority, that the industries those are being established and are in operation, falling in the low hazard category are finding the undue burden of the fixed fire fighting installations prescribed in the provisional fire approval.

2. In view of optimizing the Fire Prevention and Life Safety Measures by invoking the provisions of Note 14 of the Schedule I of the Fire Act which is specific for the "Group G" i.e. industrial occupancies deserve certain clarifications. A core group of experts was formed by this Directorate to examine the issues and rationalize the optimal fire protection requirements. The modified requirements are prescribed in **Annexure "A"**. The detailed requirements for sprinklers, detection and fire alarm system based on total process or storage area is provided in **Annexure "A-1"** which are based on the following parameters:-

- (I) Instead of plot size of the industry, built up area is given consideration for application of Schedule I of the Fire Act.
- (II) Performance based fire safety requirements;  
In a particular establishment, there are multiple activities such as;
  - (a) Raw material storage

- (b) Processing
- (c) Inter-media product storage
- (d) Final processing
- (e) Finishing products/goods storage

In addition to the above, there are certain other support activities;

- (i) Electrical installations such as sub-station, transformer and electrical switch yard etc.
- (ii) Boiler plants with Fossil fuel, coal, bagas or pipe gas fuel
- (iii) Chilling, cooling plants
- (iv) Captive power generation
- (v) Hydrocarbon storage
- (vi) Industrial gases such as nitrogen, oxygen, hydrogen, chlorine, ammonia etc.
- (vii) Effluent treatment plants

Though the above activities are generic, every industry has specific requirements and therefore, the **Annexure "A" and "A-1"** is framed keeping in view the amount of likely fire risk in different activity area of the industries and accordingly fire protection with sprinkler, detection and fire alarm system are recommended.

3. Though the Note 14 provides certain discretion to the local Fire Chiefs, the spirit of the Fire Act does not encourage discretion to avoid its misuse by the authorities and misuse of opportunities by the occupiers. It has been, therefore, decided to standardize requirements which are prescribed in **Annexure "A" and "A-1"**.

4. All the Local Authorities and Special Planning Authorities are hereby directed to implement and enforce the provisions prescribed in **Annexure "A" and "A-1"** of this Office Order to avoid undue hardship and to facilitate orderly promotion and growth of industries and health care facilities in the State of Maharashtra. This Office Order shall give substantial relief to the entrepreneurs/industries in the State without compromising Fire and Life Safety of the occupants.

The above order shall come in force with immediate effect.

  
 (M.V. Deshmukh)  
 Director,  
 Maharashtra Fire Service

Encl : Industrial occupancy  
 & **Annexure "A" and "A.1"**

Copy submitted to :

The Principle Secretary (I), UDD, Mantralaya, Mumbai 400 032  
 The Principle Secretary (II), UDD, Mantralaya, Mumbai 400 032.

Copy forwarded with compliments for information and necessary action to :

1. Municipal Commissioners of all Municipal Corporations,
2. Metropolitan Commissioner, MMRDA, Mumbai
3. Chief Executive Officer/Managing Director, MIDC/CIDCO
4. Commissioner & Director, DMA, Worli, Mumbai 400 032
5. Chief Executive Officer of NIT, Pimpri Chichwad New Town Devel. Authority,
6. The Director, Town Planning, Central Building, Ground floor, Pune 411 001
7. Deputy Secretary (UD.20), UDD, Mantralaya, Mumbai 400 032
8. Desk Officer (UD.20), UDD, Mantralaya, Mumbai 400 032
9. Chief Officers of all Municipal Councils
10. Chief Officer of Tuljapur and Pandharpur Spl. Development Authorities and  
Other Special Planning Authorities notified under the M.R.T.P. Act.

		Type of Installation									Water Supply (Ltrs.)		Pump Capacity ( Ltrs./min)	
Sr.N o.	Type of Bulding Occupancy	Fire Extingusher	Hose Reel	Dry Riser	Wet Riser	Down Comer (See Note 2)	Yard Hydrant	Automatic Sprinkler System.	Manually Operaed Electric Fire Alarm System	Automatic Detection & Alarm System.	Underground Static Water Storage Tank	Terrace Tank (See Note 11)	Pump near Undergroung Static Water Storage Tank (Fire Pump) with Min.Pressure of 3.5kg/cm2 at Terrace Level.	At the Terrace Tank Level with Min.Pressure of 2.0kg/cm2
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	INDUSTRIAL BUILDING (G)													
	Low Hazard (G-1)													
	1 ) Built up area up to 500m2	R	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
	2 ) Built up area from 500 m2 to 1000 m2	R	NR	NR	NR	NR	NR	NR	NR	NR	NR	5000	NR	NR
	3) Built up area from 1000 m2 up to 2000 m2	R	R	NR	NR	NR	NR	NR	NR	NR	NR	10000	NR	180 lpm
	4) Built up area from 2000 m2 up to 3000 m2	R	R	NR	R	R	NR	R ( see note 1)	R	NR	15,000 (5,000) (See Note 4)	5,000	450 lpm	180 lpm
	5) Built up area from 3000 m2 up to 5000 m2	R	R	NR	R	R	R	R ( see note 1)	R	R	40,000 (10,000) (See Note 4)	10,000 (5000) (See Note 4)	900 lpm ( See note 7)	450 lpm
	6) Built up area more than 5000 m2	R	R	NR	R	R	R	R ( see note 1)	R	R	50,000 (10,000) (See Note 4)	10,000 (5000) (See Note 4)	1620 lpm (See note 8)	900 lpm

Type of Installation											Water Supply (Ltrs.)	Pump Capacity ( Ltrs./min)		
Sr.N o.	Type of Building Occupancy	Fire Extinguisher	Hose Reel	Dry Riser	Wet Riser	Down Comer (See Note 2)	Yard Hydrant	Automatic Sprinkler System.	Manually Operated Electric Fire Alarm System	Automatic Detection & Alarm System.	Underground Static Water Storage Tank	Terrace Tank (See Note 11)	Pump near Underground Static Water Storage Tank (Fire Pump) with Min.Pressure of 3.5kg/cm2 at Terrace Level.	At the Terrace Tank Level with Min.Pressure of 2.0kg/cm2
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	<b>INDUSTRIAL BUILDING (G)</b>													
	<b>Moderate Hazard (G-2)</b>													
	1 ) Built up area up to 500m2	R	R	NR	NR	R	NR	R ( see note 1)	NR	NR	NR	5,000 (5000) (See Note 1,2,4 &5)	NR	180 lpm
	2 ) Built up area more than 500 m2 to 1000m2	R	R	NR	NR	R	NR	R ( see note 1)	NR	NR	20,000 (5,000) (See Note 4)	10,000 (5000) (See Note 1,2,4 &5)	600 lpm (see note 6)	180 lpm
	3) Built up area from 1000 m2 to 3000 m2	R	R	NR	R	R	R	R ( see note 1)	R	NR	30,000 (5,000) (See Note 4)	10,000 (5000) (See Note 1,2,4 &5)	900 lpm (see note 7)	450 lpm
	4) Built up area more than 3000 m2 to 5000 m2	R	R	NR	R	R	R	R ( see note 1)	R	R	40,000 (10,000) (See Note 4)	10,000 (5000) (See Note 1,2,4 &5)	1620 lpm (See note 8)	450 lpm
	5) Built up area more than 5000 m2	R	R	NR	R	R	R	R	R	R	60,000 (10,000) (See Note 4)	10,000 (5000) (See Note 1,2,4 &5)	2280 lpm (See note 9)	450 lpm

Type of Installation											Water Supply (Ltrs.)	Pump Capacity ( Ltrs./min)		
Sr.N o.	Type of Building Occupancy	Fire Extinguisher	Hose Reel	Dry Riser	Wet Riser	Down Comer (See Note 2)	Yard Hydrant	Automatic Sprinkler System.	Manually Operated Electric Fire Alarm System	Automatic Detection & Alarm System.	Underground Static Water Storage Tank	Terrace Tank (See Note 11)	Pump near Underground Static Water Storage Tank (Fire Pump) with Min.Pressure of 3.5kg/cm2 at Terrace Level.	At the Terrace Tank Level with Min.Pressure of 2.0kg/cm2
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	INDUSTRIAL BUILDING (G)													
	High Hazard (G-3)													
	1 ) Built up area up to 500m2	R	R	NR	R	R	NR	R ( see note 1)	NR	NR	20,000 (5,000) (See Note 4)	5,000 (5000) (See Note 1,2,4 &5)	450 lpm (see note 7)	180 lpm (See Note 1,2,4 &5)
	2 ) Built up area from 500 m2 to 1000m2	R	R	NR	R	R	R	R ( see note 1)	NR	R	50,000 (5,000) (See Note 4)	10,000 (5000) (See Note 1,2,4 &5)	1620 lpm (see note 8)	450 lpm (See Note 1,2,4 &5)
	3) Built up area from 1000 m2 to 3000 m2	R	R	NR	R	R	R	R	NR	R	1,00,000	20,000 (5000) (See Note 1,2,4 &5)	2280 lpm (See note 9)	900 lpm (See Note 1,2,4 &5)
	4) Built up area more than 3000 m2	R	R	R	R	R	R	R	R	R	1,50,000	20,000 (5000) (See Note 1,2,4 &5)	2850 lpm (See note 10)	900 lpm (See Note 1,2,4 &5)

Sr.No.	Notes
1	Sprinkler Required to be installed in the basement, if area of Basement area exceeds 200sq. Mtrs. & or if the height of building is 15 mtrs. or above.
2	Down comer is required for the building having Ground + upper floor(s) up to 15 meter building height.
3	The standby pump can be of electrical driven pump, if dedicated supply is provided from D.G.set by dedicated feeder however for Group G-1 & G-2 above 5000 and 2000 Sq. Mtrs. respectively & for all G-3 i.e. high hazard buildings, diesel engine driven standby Fire Pump is mandatory.
4	Additional value given in parenthesis shall be added is basement area exceeds 200 Sq. mtrs. & or if the floor plate is more than 1125 Sq.mtrs. & or if the height of the building is 15 Mtrs or above
5	If providing over head tanks is not possible due to type of structure like typical industrial sheds, the quantity mentioned in column no.13 shall be added in the quantity mentioned in the column no.12.
6	2 nos. of electrically operated Fire pumps of 600 lpm & 01 no. of electrically operated jockey pump of 180 lpm shall be provided, the dedicated power supply to fire pumps is provided from diesel generator.
7	2 nos. of electrically operated Fire pumps of 900 lpm & 01 no. of electrically operated jockey pump of 180 lpm shall be provided, the dedicated power supply to fire pumps is provided from diesel generator.
8	One electric driven main pump of at least 1620 LPM discharge capacity, one standbye pump of similar capacity driven by diesel engine and one jockey pump of capacity 180 LPM shall be provided upto 50 hydrants (including those in wet risers and yard) for every unit or tower. In case, the number of hydrants are more than 50, additional main pumps of same capacity shall be provided for every 50 hydrants or part thereof. Separate but interconnected hydrant system(s) with its/their own pump house(s) may be provided with pumping and water capacity notified for each in the Table. Minimum pressure of 3.5 bars shall available at hydrants near Terrace level and also hydraulically most remote hydrant.
9	one electric driven main pump of at least 2280 LPM discharge capacity for hydrant system upto 75 hydrants (including those in wet risers and yard), one electric driven main pump of at least 2280 LPM discharge capacity for Sprinkler system and one standbye pump of similar capacity driven by diesel engine and two jockey pumps each of capacity 180 LPM one each for hydrant and sprinkler systems shall be provided for every unit or tower. In case, the number of hydrants are more than 75, additional main pumps of same capacity shall be provided for every 75 hydrants or part thereof. Minimum pressure of 3.5 bars shall available at hydrants near Terrace level and also hydraulically most remote hydrant.
10	one electric driven main pump of at least 2850 LPM discharge capacity for hydrant system upto 75 hydrants (including those in wet risers and yard), one electric driven main pump of at least 2850 LPM discharge capacity for Sprinkler system and one standbye pump of similar capacity driven by diesel engine and two jockey pumps each of capacity 180 LPM one each for hydrant and sprinkler systems shall be provided for every unit or tower. In case, the number of hydrants are more than 75, additional main pumps of same capacity shall be provided for every 75 hydrants or part thereof. Minimum pressure of 3.5 bars shall available at hydrants near Terrace level and also hydraulically most remote hydrant.
11	If structure is typical industrial shed then instead of terrace level water tank, the underground water tank shall be provided.
12	In case of Sprinkler and Fire Detection System is concern the area mention in Annexure A-1 should be followed. The area indicated above is ground floor or upper level floor area of maximum floor plate in a industrial unit.

# "Annexure- A 1 "

## Industrial fire protection requirements

- A) Following sheets provide guidelines for minimum fire protection requirements for all types of industries falling under different types of categories such as Low/moderate and High hazards (Group G of the National Building Code)
- B) The guidelines provide only for the Process, Storage and tankage in open. Unless specifically provided for, the guidelines are not applicable to Utility Blocks situated within the industrial compounds. If Utility buildings are either situated within the Process/Storage buildings or communicating thereto, Utility blocks shall also be protected as applicable for the Process/Storage buildings concerned. Requirements which are applicable to the entire unit, shall also apply to Utility buildings. For quick reference, examples of Utility Blocks are listed below:

*Boiler Houses, Humidification and Air-Conditioning Plants, Fan Houses, Water Cooling Plants, Electric Motor Rooms, Firing Places including Compressor Houses handling only air, inert gases such as Nitrogen, Argon, Helium, and Carbon - di- oxide, Effluent Treatment Plants (Aerobic), Cooling towers, Engine Houses, Gear Alley, Rope Race, Motor Rooms, Electric Sub - Station / Transformers in the open, Diesel generator house Vehicular parking, Dish Antennas, Stables, Baby creches, Telephone exchanges, Weigh-bridges, Wireless Transmitting Stations, Office blocks, Security offices, Fire Pump house handling water and liquids having flash point of above 65 ° C and all non flammable liquids, Water tanks, Water Treatment, Water Filtration Plants.*

- C) Certain requirements apply only when the area of the building is more than 2000M<sup>2</sup>. This area i.e. 2000M<sup>2</sup> represents a single fire compartment. If the building area is more than 2000M<sup>2</sup>, it is possible to divide the building into two or more fire compartments by fire separating walls and fire doors having two hours fire rating. If not, the entire building shall comply with the requirements for fire protection as specified.
- D) In case of mixed occupancy i.e. process and storage areas are under one roof or communicating with each other, fire protection requirements for the building shall be governed by the occupancy that demands higher protection. In this case also, fire separation as mentioned above is possible to apply 'per se' protection.
- In case of mixed occupancy i.e. process and storage areas are under one roof or communicating with each other, fire protection requirements for the building shall be governed by the occupancy that demands higher protection. In this case also, fire separation clause is applicable as mentioned above for 'per se' consideration



Where the process and storage blocks are under one roof are in communication with each other, the entire occupancy shall be considered as a Godown if area occupied by storage is more than 50%. Protection philosophy applicable to the godown shall apply on the entire occupancy. Fire separation clause is applicable for 'per se' consideration

- E) Processes other than what is stated in the accompanying sheets shall be referred to the concerned standards issued by BIS shall be followed.
- F) Protection with hand appliances, hose reels and hydrant system with risers etc. shall be applied as per Table 23 of NBC. The design of the protection shall be governed by IS-13039. Sprinkler, water spray, foam, gaseous systems etc. Shall be provided where required in accordance with IS-15015, IS-15325, IS-2189 etc...
- G) The authorities shall insist for higher risk areas fire protection if the industry have combination of Low/ Light, Moderate/Ordinary or High Hazard in same building. If the risk is segregated in three different compartments then the respective fire protection shall be provided

## LIGHT/ LOW HAZARD OCCUPANCIES

Description	Sprinkler system		Fire Alarm system	Special protection systems
	Process blocks	Storage blocks		
Abrasive Manufacturing Premises	NR	Required for Packing material/ other raw materials godowns if exceeding 2000M2 in area	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2	Nil
Aerated Water Factories, Mineral water factories	NR	Required for Packing material/ Bottles and other raw materials godowns if exceeding 2000M2 in area	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2	Nil
Agarbatti Manufacturing	NR	Required for Packing material/Finished goods and other raw materials godowns if exceeding 2000M2 in area	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2	

Aluminium/Zinc and Copper Factories	NR	NR	Suitable detection system backed up by Manual call stations shall be provided for the entire factory where combined area of the process/Storage blocks exceeds 5000M2	Nil
Analytical and/or Quality Control Laboratories (Without Pilot plant)	Required if the combined floor area of the building is more than 5000M2	NR	Suitable detection system backed up by Manual call stations shall be provided for the entire factory where combined area of the process/Storage blocks exceeds 5000M2	Nil
Asbestos Steam Packing & Lagging Manufacturers.	NR	NR	Suitable detection system backed up by Manual call stations shall be provided for the entire factory where combined area of the process/Storage blocks exceeds 5000M2	Nil

Battery Charging/Service Station	NR	NR	Suitable detection system backed up by Manual call stations shall be provided for the entire factory where combined area of the process/Storage blocks exceeds 5000M2	Nil
Battery Manufacturing	NR	Required for Packing material/Finished goods and other raw materials godowns if exceeding 2000M2 in area	Suitable detection system backed up by Manual call stations shall be provided for the entire factory where combined area of the process/Storage blocks exceeds 5000M2	Nil
Breweries	NR	Required for Packing material/Finished goods and other raw materials godowns if exceeding 2000M2 in area	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2	Nil
Brick Works	NR	NR	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2	Nil
Canning Factories	NR	NR	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2	Nil

Cardamom Factories	NR	NR	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2	Nil
Cement Factories and/or Asbestos Products Manufacturing.	NR	NR	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M6	Nil
Ceramic Factories and Crockery and Stoneware Pipe Manufacturing.	NR	NR	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M7	Nil
Clay Works	NR	NR	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M8	Nil
Clock and Watch Manufacturing	NR	Raw Material godowns shall be sprinklered if the value of plastic/rubber and other similar commodities in the storage area exceeds 20% of the total value of the storage building.	Manual fire alarm system shall be provided throughout, Operations like spray painting, wood working, solvent cleaning etc, shall need to be spot-protected if combined area occupied by such operations exceed 10% of the total manufacturing area	Nil

Coffee Curing & Roasting Premise	Required if the area occupied by process building exceeds 2000M2.	Required for Packing material/Finished goods and other raw materials godowns if exceeding 2000M2 in area	If combined area of the entire factory is more than 2000M2, manual fire alarm system shall be required, Suitable detection system backed up by Manual call stations shall be provided for the entire factory where combined area of the process/Storage blocks exceeds 5000M2	If combined area of process and storage blocks in the same building exceeds 2000M2, sprinkler installation will be required in the entire area
Condensed Milk Factories, Milk Pasteurising Plant and Dairies.	NR	Required for Packing material/Finished goods and other raw materials godowns if exceeding 2000M2 in area	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2	Nil
Confectionery Manufacturing	NR	Required for Packing material/Finished goods and other raw materials godowns if exceeding 2000M2 in area	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2	Nil
Electric Generating Houses (Hydel)	NR	Sprinkler protection for storage areas not forming part of main occupancy if area exceeds 2000M2.	Auto fire alarm system for all areas except detached storage buildings and Utility blocks where Manual alarm systems shall be provided	Water spray system for transformers, cable galleries, conveyors including transfer towers.

Electric Lamps (Incandescent & Fluorescent) and TV and display units manufacturing	NR	Required for Packing material/Finished goods and other raw materials godowns if exceeding 2000M2 in area	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2	Nil
Electric Sub- Station/Distribution Station.	NR	NR	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2	Water spray system for transformers if capacity thereof is more than 10MVA or oil capacity exceeds 2000L.
Electro Plating Works.	NR	NR	NR	NR
Electronic and/or Computer Equipments Assemble and Manufactures	NR	Required for Packing material/Finished goods and other raw materials godowns if exceeding 2000M2 in area	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2	Nil

**Engineering Workshops**

**Heavy** (Structural Steel Fabricators, Sheet Metal Fabricators (Tin Printing excluded), Hot or Cold Rolling, Pipe Extruding, Stamping, Pressing, Drawing (other than wire Drawing) or Forging Mills, Ore Crushing Mills, Ferrous and non Ferrous Metal Smelting or Extraction Works and Foundries (allowing storage of Wooden Patterns only) and galvanising works and the like)

**Engineering workshops**

**Light** (Blacksmiths, Electroplating, Anodising or Lead, Zinc or other Metal Coating Works, Machine Shops, Heat Treatment shops, Electro Magnets Mfgs., Electrical and Mechanical Machinery)

Fruits and Vegetables Dehydrating/Drying Factories.

NR

Raw Material godowns shall be sprinklered if the value of plastic/rubber and other similar commodities in the storage area exceeds 20% of the total value of the storage building.

Manual fire alarm system shall be provided throughout, Operations like manufacture of Plastic/Rubber Components, Powder coating/spray painting, Drying of Painted Goods, use or storage of Flammable Liquids having Flash point of 32°C and below, Wood working, Upholstering, Engine Testing and Flammable Gas Plant shall need to be spot-protected by appropriate means if combined area occupied by such operations exceed 10% of the total manufacturing area. Else such areas shall be fire separated from the main operations

NR

Required for Packing material/Finished goods and other raw materials godowns if exceeding 2000M2 in area

Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2

Nil



Fruit Products and Condiment Factories.	NR	Required for Packing material/Finished goods and other raw materials godowns if exceeding 2000M2 in area	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2	Nil
Glass & Glass Fibre Manufacturing.	NR	Required for Packing material/Finished goods and other raw materials godowns if exceeding 2000M2 in area	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2	Nil
Gold Thread Factories/Gilding Factories.	NR	NR	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2	Nil
Granite manufacturing	NR	NR	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2	If inflammableliquids having a flash point of less than 65° are used, manual foam spray system shall be used in the areas concerned.
Gum and/or Glue and Gelatine Manufacturing.	NR	Required for Packing material/Finished goods and other raw materials godowns if exceeding 2000M2 in area	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2	Nil
Ice Candy and Ice-cream Manufacturing.	NR	NR	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2	Nil

Ice Factories.	NR	NR	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2	Nil
Ink (excluding Printing Ink) Factories	NR	Required for Packing material/Finished goods and other raw materials godowns if exceeding 2000M2 in area	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2	Nil
Laundries.	NR	NR	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2	Nil
Mica Products Manufacturing.	NR	NR	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2	Nil
Pottery Works.	NR	NR	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2	Nil
Poultry Farms.	NR	NR	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2	Nil
Salt Crushing Factories and Refineries.	NR	NR	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2	Nil

Sugar Manufacturing.	Candy	NR	NR	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2	Nil
Sugar Factories and Refineries.		NR	NR	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2	Nil
Tea Blending and Tea Packing Factories		Required if the area occupied by process building exceeds 2000M2.	Required for Packing material/Finished goods and other raw materials godowns if exceeding 2000M2 in area	If combined area of the entire factory is more than 2000M2, manual fire alarm system shall be required, Suitable detection system backed up by Manual call stations shall be provided for the entire factory where combined area of the process/Storage blocks exceeds 5000M2	If combined area of process and storage blocks in the same building exceeds 2000M2, sprinkler installation will be required in the entire area
Umbrella Factories	Assembling	NR	NR	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2	Nil
Vermicelli Factories.		NR	NR	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2	Nil
Water Treatment/Water Filtration Plants and Water Pump House.		NR	NR	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2	Nil

## Ordinary/ Moderate Hazard occupancies

Description	Sprinkler system		Fire Alarm system	Special protection systems
	Process bolcks	Storage blocks		
Airport and other Transportation Terminal Building.	To be fully sprinklered	To be fully sprinklered (Cargo)	To be fully protecxted by automatic intelligent fire alarm systems	Kitchen hoods and ducts shall be perotected with dry chemical systems
Bakeries.	NR	NR	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2	NIL
Beedi Factories.	NR	NR	NR	NIL
Biscuit Factories.	NR	Required for Packing material / Finished goods and other raw materials godowns if exceeding 2000M2 in area	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2	NIL
Bobbin Factories.	NR	NR	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2	NIL

Bookbinders, Envelopes & Paper bag Manufacturers.	Required when a single un-compartmented area is more than 2000M2	Required for Packing material/Finished goods and other raw materials godowns if exceeding 2000M2 in area	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2.	NIL
Cable manufacturing	NR	Required for Packing material/Finished goods and other raw materials godowns if exceeding 2000M2 in area	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2.	NIL
Carbon Paper/Typewriter Ribbon Manufacturers.	NR	Required for Packing material/Finished goods and other raw materials godowns if exceeding 2000M2 in area	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2.	NIL
Cardboard Box Manufacturing.	NR	Required for Packing material/Finished goods and other raw materials godowns if exceeding 2000M2 in area	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2.	NIL
Carpenters, Wood wool & Furniture Manufacturers.Basket weavers, Cane furniture mfgrs	Required when a single un-compartmented area is more than 2000M2	Required for Packing material/Finished goods and other raw materials godowns if exceeding 2000M2 in area	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2.	NIL

Carpet and Drugget Factories.	NR	Required for Packing material/Finished goods and other raw materials godowns if exceeding 2000M2 in area	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2.	NIL
Chemical Manufacturing involving following operations  Chemicals, dyes , intermediates , pigments, acids, medicinal/ pharmaceuticals formulation & toilet preparation including soap manufacturing, chemical mixing & blending factories using no chemicals/ solvents having flash point below 32°C	NR	NR	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2.  Automativ fire alarm system shall be provided for Godown buildings, Manual system for process blocks	If the quantity of chemicals/ solvents having flash point below 32°C is less than 200Ltrs in process & there is no storage of such solvents/ chemicals more than 200Ltrs then such industries can be considered under this table. Else, see High hazard
Cigar and Cigarette Factories.	Required in full	Required in full		Nil

Coffee grinding premises	NR	Required for Packing material/Finished goods and other raw materials godowns if exceeding 2000M2 in area	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2.	Nil
Coir, Carpets, Rugs and Tobacco, Hides and Skin Presses	NR	Required for Packing material/Finished goods and other raw materials godowns if exceeding 2000M2 in area	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2.	Nil
Cork products manufacturing	NR	NR	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2.	Nil
Dry Cleaning, Dyeing, Laundries.	NR	NR	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2.	Nil
Electric Generating stations (other than Hydel)	NR	Sprinkler protection for storage areas not forming part of main occupancy if area exceeds 2000M2.	Auto fire alarm system for all areas except detached storage buildings and Utility blocks where Manual alarm systems shall be provided	Water spray system for transformers, cable galleries, conveyors including transfer towers.

Enamelware Factories.	NR	NR	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2.	Nil
Filter & Wax paper Manufacturing.	NR	Required for Packing material/Finished goods and other raw materials godowns if exceeding 2000M2 in area	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2.	Nil
Flour Mills.	Required if Combined floor plate area exceeds 2000M2.	Required for Packing material/Finished goods and other raw materials godowns if exceeding 2000M2 in area	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2.	Nil
Garment Makers	NR	NR	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2.	Nil
Ghee Factories (other than vegetable)	NR	NR	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2.	Nil



Grain and/or Seeds Disintegrating and/or Crushing Factories.	Required if Combined floor plate area exceeds 2000M2.	Required for Packing material/Finished goods and other raw materials godowns if exceeding 2000M2 in area	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2.	Nil
Grease Manufacturing.	NR	NR	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2.	Nil
Hat and Topee Factories.	NR	NR	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2.	Nil
Hosiery, Lace, Embroidery & Thread Factories.	Required if Combined floor plate area exceeds 2000M2.	Required for Packing material/Finished goods and other raw materials godowns if exceeding 2000M2 in area	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2.	Nil
Incandescent Gas Mantle Manufacturers,	NR	NR	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2.	Nil

Industrial Gas Mfg. Including halogenated hydrocarbon gases	NR	Required for Packing material/Finished goods and other raw materials godowns if exceeding 2000M2 in area	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2.	Nil
Linoleum Factories.	NR	NR	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2.	Nil
Man-made Yarn/Fibre Manufacturing (Except Acrylic)	Required if Combined floor plate area exceeds 2000M2.	Required for Packing material/Finished goods and other raw materials godowns if exceeding 2000M2 in area	Automatic fire alarm system shall be provided when combined floor plate exceeds 5000M2, wlse manual systems shall do	Nil
Manure and Fertiliser Works. (Blending, Mixing and granulating only)	NR	NR	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2.	Nil
Mineral Oil Blending and Processing.	NR	NR	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2.	Nil

Oil & Leather Cloth Factories.	NR	Required for Packing material/Finished goods and other raw materials godowns if exceeding 2000M2 in area	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2.	Nil
Oxygen Plants.	Required for manufacturing blocks	Required for storage blocks	Automatic fire alarm systems shall be provided throughout	Nil
Plywood Manufacturing/Wood Veneering Factories.	NR	Required for Packing material/Finished goods and other raw materials godowns if exceeding 2000M2 in area	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2.	Nil
Paper & Cardboard Mills.	NR	Raw material and Finished goods storage shall be provided with sprinklers	Automatic fire alarm systems shall be provided throughout	Nil
Plastic Goods Manufacturing				

a) Polytetra fluoroethylene, Flourinated ethylene-propylene, Poly-chlorotrifluoroethylene, Polyvinyl chloride, Polyvinyl acetate, Polyvinylidene chloride, Vinyl Chloride-vinylidene, chloride copolymer, Polyvinylidene fluoride, Polycarbonate, Phenylene oxide polymer, Polysulfone, Chlorinated polyether, Phenolics, Melamine Formaldehyde, Urea formaldehyde, Silicones, Phenol furfural, Phenol formaldehyde, Tetrafluoro ethylene, Polyvinyl fluoride, Cresol formaldehyde, Polyamide (Nylon). Rope works, assembling of plastic goods such as toys and the like.

NR

Raw material and Finished goods storage shall be provided with sprinklers if area exceeds 2000M2

Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2.

Nil

b) Polyethylene, Polypropylene, Polybutylene, Ethylenemethacrylic acid ionomer, Polyvinyl alcohol, Polyvinyl butyrate, Polyvinyl formate, Polystyrene, Styrene-acrylonitrile copolymer, Acrylonitrile-butadiene-styrene, Polymethyl methacrylate, Cellulose acetate, Cellulose acetate butyrate, Cellulose propionate, Cellulose triacetate, Ethyl cellulose, Acetal, Epoxy, Polyesters, Polyurethanes, Acid monomer, Acrylate, Allyl, Methyl methacrylate, Polythene.	Required if area of building(s) exceeds 2000M2	Raw material and Finished goods storage shall be provided with sprinklers	Manual fire alarm system for entire unit if area of building(s) exceeds 2000M2	
c) Foamed plastics	Required	Raw material and Finished goods storage shall be provided with sprinklers	Manual fire alarm system for entire unit	
Printing Press Premises.	Required if area of building(s) exceeds 2000M2	Required for Packing material/Finished goods and other raw materials godowns if exceeding 2000M2 in area	Manual fire alarm systems required if area of building(s) exceeds 2000M2	Nil
Pulverising and Crushing Mills.				

a) Metal and Metallic Ores (excluding Aluminium and Magnesium metals), Goods under Cat-1 and Cat-2	NR	Required for Packing material/Finished goods and other raw materials godowns if exceeding 2000M2 in area	Manual fire alarm systems if the floor area exceeds 2000M2.	Nil
b) Goods under Cat-3 and also Metallic ores of Aluminum and Magnesium and Coal	Required if area of building(s) exceeds 2000M2	Required for Packing material/Finished goods and other raw materials godowns if exceeding 2000M2 in area	Automatic fire alarm systems if the floor area exceeds 2000M2.	Depending on the circumstances like water reacting chemicals, open-sided structure etc, sprinklers may be replaced with water spray, mist systems
Rice Mills.	NR	NR	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2.	Nil
Rope Works (other than plastic)	NR	NR	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2.	Nil
Rubber Tyres & Tubes Manufacturing	Required if area of building(s) exceeds 2000M2	Required for Packing material / Finished goods godowns	Automatic fire alarm systems if the floor area exceeds 2000M2.	Nil

Shellac Factories.	NR	NR	Manual fire alarm system required	Only local protection i.e. where chemicals used, have a flash point below 32 deg C, with medium velocity water spray for manufacturing blocks, Similar protection for the area where materials are stored (raw material as well as Finished goods).
Silk Filatures and cocoon stores.	NR	NR	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2.	Nil
Spray painting	NR	NR	NR	Local gas flooding system required if the area exceeds 500M2
Soaps and Glycerine Factories.	NR	Raw Material and Finished goods godowns shall be sprinklered if the stoarge area is more than 2000M2. Automatic fire alarm system required	Automatic fire alarm systems if the floor area exceeds 2000M2.	Nil
Starch Factories	NR	NR	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2.	Nil

Steel Plants (Gas Based)		NR	NR	Automatic fire alarm systems if the floor area exceeds 2000M2.	Nil
Tanneries/Leather Manufacturers.	Goods	NR	NR	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2.	Nil
Tank farms other than those categorised under high hazard 'A'.	Water spray/Foam system as applicable shall be provided for all tanks				
Textile Mills.		Required for all Process blocks from Mixing operations till Weaving shed.	Required for Raw material and Finished goods godowns	Automatic fire alarm systems shall be provided for Raw materials and Finished goods godowns	Hazardous areas like Singeing, Raising, Polymerizing etc shall be fire separated ( 2 hours) from adjoining blocks. Concealed spaces/return air ducts/plenum in all process blocks upto weaving shall be provided with QR sprinklers. Diversion systems shall be provided where the chute feed machines are installed between blow and carding sections



Tea Factories.	Required if area of building(s) exceeds 2000M2	Required if area exceeds 2000M2	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2.	Nil
Tobacco (Chewing) and Pan-masalla Making.	NR	NR	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2.	Nil
Tobacco Grinding and Crushing.	NR	NR	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2.	Nil
Tobacco Redrying Factories.	NR	NR	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2.	Nil
Woollen Mills.	Required for all processing areas	Required for Raw material/ Finished goods godowns	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2.	Nil

## High Hazard occupancies

Description	Sprinkler system		Fire Alarm system	Special protection systems
	Process bolcks	Storage blocks		
Aircraft Hangers	Required in full	Required in full	Automatic intelligent fire alarm system with flame detectors	High expansuion foam systems
Aluminium/Magnesium Powder Plants	NR	NR	Manual fire alarm system for entire unit if area of single largest building exceeds 2000M2	Special dry powder systems aas recommended in NFPA standards
Bituminised Paper and/or Hessian Cloth Manufacturing including Tar Felt Manufacturing.	NR	Raw material and Finisged goods godowns shall be sprinklered	Manual fire alarm system for entire unit	NR
Chemical Manufacturing involving following operations				

Chemicals, dyes, intermediates, pigments, acids, medicinal/pharmaceuticals formulation & toilet preparation including soap manufacturing, chemical mixing & blending factories using chemicals/solvents having flash point below 32°C and Metallic nitrates, coal tar & wood distillation plant		MV spray systems and /or foam system shall be provided locally as applicable for vessels, pumps, compressors, reactors.columns etc. where chemicals having flash point below 32 deg C are in processs. (Suitable care shall taken to check whether chemicals are water reacting)	MV spray systems and Gaseous protection systems as applicable for godowns storing materials with flash points below 32 deg C. (Suitable care shall taken to check whether chemicals are water reacting)	Manual fire alarm systems shall be provided for entire unit	All tanks having a diameter of 9M or more, storing Class A or B chemicals shall be provided with MV spray systems and foam systems as applicable backed up with suitable detection systems
Cotton Waste Factories		Entire area shall be sprinklered if the combined area of all buildings exceed 2000M2		Manual fire alarm systems shall be provided for entire unit	
Coal and/or Coke and/or Charcoal Ball Briquettes Manufacturing.	NR		Raw materials and Finished goods godown shall be sprinklered when area is more than 2000M2.	Manual fire alarm systems shall be provided for entire unit	
Celluloid Goods Manufacturing.	NR		NR	Manual fire alarm systems shall be provided for entire unit	Alcohol resistant foam, Carbon dioxide (CO2).Dry chemicals where applicable for all process areas and Godowns

Cigarette Manufacturing.	Filter	Required for all process areas	Raw materials and Finished goods godown shall be sprinklered when area is more than 2000M2.	Manual fire alarm systems shall be provided for entire unit	NR
Cinema Films & T.V. Production Studios		Required for all process areas	Godowns shall be sprinklered if area is more than 2000M2	Automatic fire alarm system shall be provided.	NR
Cotton Seed Cleaning or De-linting Factories, Cotton ginning and pressing units.		Required for all process areas	Godowns shall be sprinklered if area is more than 2000M2	Manual fire alarm systems shall be provided for entire unit	NR
Distilleries.		Local protection with MV spray/Foam systems as applicable shall be provided for process areas	NR	Automatic fire alarm system shall be provided.	NR
Duplicating and Stencil Paper Manufacturing.		Required for all process areas	Godowns shall be sprinklered if area is more than 2000M2	Manual fire alarm systems shall be provided for entire unit	NR
Fire-works Manufacturing.		Required for all process areas	Required for all Raw material and finished goods godowns	Manual fire alarm systems shall be provided for entire unit	NR
Foamed Manufacturing and/or Converting Plants.	Plastics	Required for all process areas	Required for all Raw material and finished goods godowns	Manual fire alarm systems shall be provided for entire unit	NR

Jute mills & jute presses	Required for all process areas	Required for all Raw material and finished goods godowns	Manual fire alarm systems shall be provided for entire unit	NR
LPG Bottling Plants	Required for all process areas	Required for all storage and decantation, truck loading areas	Manual fire alarm systems shall be provided for entire unit	LPG storage tankage like bullets and spheres shall be protected with MV water spray systems backed up with suitable detection svstems.
Match Factories.	Required for all process areas	Required for all Raw material and finished goods godowns	Manual fire alarm systems shall be provided for entire unit	NR
Man Made Fibres (Acrylic fibres/yarn making)	Required for all process areas	Required for all Raw material and finished goods godowns	Automatic fire alarm systems shall be provided for entire unit	NR
Mattress and Pillow Making.	Required for all process areas if area of the building is more than 2000M2	Required for all Raw material and finished goods godowns having area more than 2000M2	Manual fire alarm systems shall be provided for entire unit	NR
Metal or Tin Printers	Required for all process areas if area of the building is more than 2000M2	Required for all Raw material and finished goods godowns having area more than 2000M2	Manual fire alarm systems shall be provided for entire unit	where more than 50 % of floor area is occupied as Engineering Workshop; may be taken as Ordinary Hazard occupancy

Oil Mills		NR	NR	Automatic fire alarm systems shall be provided for entire unit	Local protections such as MV spray or foam systems as applicable shall be provided in process and storage areas
Oil Extraction Plants (other than those forming part of ghee factories & oil refining factories.)		NR	NR	Automatic fire alarm systems shall be provided for entire unit	Local protections such as MV spray or foam systems as applicable shall be provided in process and storage areas
Oil Terminals/Depots handling flammable liquids having flash point of 32° C and below.		Automatic MV water spray and /or Foam systems shall be provided as appliable for all tanks backed up with suitable automatic detection systems.			
Paints & Varnish Factories.		NR	NR	Automatic fire alarm systems shall be provided for entire unit	Local protections such as MV spray or foam systems as applicable shall be provided in process and storage areas
Printing Ink Manufacturing.		NR	NR	Automatic fire alarm systems shall be provided for entire unit	Local protections such as MV spray or foam systems as applicable shall be provided in process and storage areas
Saw Mills.		NR	NR	NR	Normally in open.

Surgical Manufacturers	Cotton	Required for all process areas	Required for all Raw material and finished goods godowns	Automatic fire alarm systems shall be provided for entire unit	NR
Tank Farms storing flammable liquids having flash point of 32° C and below.		Automatic MV water spray and /or Foam systems shall be provided as appliable for all tanks backed up with suitable automatic detection systems.			
Tarpaulin & Canvas Proofing Factories.		Required for all process areas where building area is more than 2000M2	Required for all Raw material and finished goods godowns where the building area is more than 2000M2	Automatic fire alarm systems shall be provided for entire unit	NR
Turpentine & Rosin Distilleries.		NR	NR	Automatic fire alarm systems shall be provided for entire unit	Local protections such as MV spray or foam systems as applicable shall be provided in process and storage areas
Tyre Retreading and Resoling Factories.		Required for all process areas where building area is more than 2000M2	Required for all Raw material and finished goods godowns where the building area is more than 2000M2	Automatic fire alarm systems shall be provided for entire unit	NR