



Bureau of Police Research & Development Central Detective Training Institute Ghaziabad

Ministry of Home Affairs, Govt of India



FIRE SAFETY MANAGEMENT

2026

Theme: Safe School, Safe Hospital

&

Fire Safety Aware Society

Together for

Fire Prevention



WHAT IS FIRE

- Fire is a chemical reaction in which energy in form of heat is produced. The chemical reaction is known as combustion.
- Combustion occurs when fuel or other material reacts rapidly with oxygen, giving off light, heat and flame.



FIRE CONSTITUENT

Essential elements of fire:

- Fuel
- Heat
- Oxygen or air
- To the extinction of fire, Remove any one of the above fire constituent.

TYPES OF FIRE

Basically there are three types of fire:

- Solids fire
- Liquids fire and
- Gaseous Fire
- Classification of fire as per IS-2190-1922 (Reaffirmed 2024).
- **Class A Fires** - Fires involving solid combustible materials of organic nature such as wood, paper, rubber, plastic, etc. where the cooling effect of water is essential for extinction of fires.
- **Class B Fires** - fires involving flammable liquids or liquefiable solids or the like where a blanketing effect is essential.
- **Class C Fires** - fires involving flammable gases under pressure including liquefied gases, where it is necessary to inhibit the burning gas at fast rate with an inert gas powder or vaporizing liquid for extinguishment.
- **Class D Fires** - fire involving combustible metals, such as magnesium, zinc, aluminium, sodium, potassium, etc., when the burning metals are reactive to water and water containing agents and in certain cases carbon dioxide, halogenated hydrocarbons, and ordinary dry powders. These fires require special media and techniques to extinguish.
- **Class F/K (Cooking Media)** - Fires involving vegetable or animal oils and fats in cooking appliances, often found in kitchens (previously part of B or K in earlier standards). These fires require wet chemical media and techniques to extinguish.

SUITABILITY OF PORTABLE FIRE EXTINGUISHERS

The types of extinguishers mentioned below against each class of fire are generally most suited.

- 1) **Class A Fires** - Water expelling type extinguisher.
- 2) **Class B Fires** - Foam, dry powder and carbon dioxide extinguishers.
- 3) **Class C Fires** - Dry powder and carbon dioxide extinguishers.
- 4) **Class D Fires** - Extinguishers with special dry powder metal fires.
- 5) **Class F Fires** - Wet Chemicals Extinguishers.

FIRE SAFETY PLAN FOR EDUCATIONAL INSTITUTIONS

No educational institution can afford to ignore the lessons learnt from the ghastly fire tragedies like the one in a school at Kumbakonam in Tamil Nadu on 16th July, 04 where 87 students lost their lives. Simple fire and safety precautions and measures given below can prevent such tragedies with commitment and no expenditure. ³



- A Teacher/Staff member who should receive proper training from an approved institute should be made responsible for the fire prevention management system. He/she will be responsible for monitoring the system and for periodical reporting to the top management.
- A fire safety and evacuation plan must be up in consultation with expert and rehearsed on regular basis.

HOW TO PREVENT FIRE

- Check Electrical appliances and cords regularly and disconnect appliances when not in use.
- Dispose off rubbish daily.
- Protect all unused electrical outlets with safety plugs.
- Keep combustible material away from ignition sources.
- Cooking should be done only in the kitchen.

LABORATORIES

- Flammable liquids, clearly labeled should be stored properly and dispense them from an approved safety container.
- Avoid storing incompatible chemicals next to each other.
- Task stock of chemicals annually and discard any which are obsolete or show signs of decomposition.
- Keep minimum inventory of chemicals.
- Clean up spill immediately.
- Do not use defective electrical gadgets and avoid overloading.

OFFICE AND STORAGE AREAS

- Avoid overloading electrical outlets and keep wiring away from doorways, windows or under carpeting.
- Carefully label store and handle cleaning compounds and polishes, as they often give off flammable vapours.
- Ensure general order and cleanliness in storage rooms.

HALLS AND DOORWAYS

- Mark the exits with illuminated exit signs and keep them un-obstructed.
- Basements if any, should not be used as classrooms or laboratories/libraries and assembly halls.

DISPLAY

- Do's and Don'ts of fire protection / prevention and escape routes should be exhibited prominently inside the school at all pre-identified places.

TRAINING

- Security staff of the school must receive adequate training in fire prevention and assist the teacher/staff member In-charge.
- Teachers/members of the staff and class prefects should get training in using portable fire extinguisher and the procedure for evacuation.

EXIT REQUIREMENTS

- At-least two separate staircases directly leading to open space of safety must be available for each floor preferably at two ends.
- Minimum number of exits based on occupant load, shall be 2 for up-to 500 occupants, 3 for between 500-1000 and 4 for more than 1000.

escape lighting system should be capable of continuous operation for a minimum duration of 1 hour and 30 minutes and should be suitably located.

- Emergency escape opening should be maintained regularly.
- Keep all the door ways clear Clearly mark the evacuation route on the school floor plan and place it adjacent to the class room door.
- Assembly areas should be earmarked so as to keep each class separate for easy accountability of all students.

FIRE EXTINGUISHING APPLIANCES

- Portable fire extinguishers should be provided in all school buildings and annexe blocks as per IS2190.
- Buildings having more than 2 storeys in height should be provided with first aid fire fighting hose-reels.
- Ample water should be stored in underground static water tanks provided with one electric and one diesel driven motor pump.
- Automatic fire alarm and detection system if installed, should conform to IS: 2189.

FIRE INSTRUCTION

In case of Fire

- Operate the nearest Fire Alarm. OR
- Call the Fire Brigade immediately.

OFFICE AND STORAGE AREAS

- When in class, the order to evacuate will be given by teacher, who will indicate the route to be followed.
- When not in class, form single file and move by the most direct route to the place of assembly.
- At all times act quietly and calmly.
- Do not stop to collect your personal belongings.
- No running is to be permitted to avoid panic.
- On staircases, everyone must descend in single file. Overtaking of classes or individuals must not be permitted.
- The Specific arrangements must be made for students with disabilities to ensure that they are assisted during evacuation.
- Anyone who is not in class when the fire alarm sounds must go immediately to the predetermined assembly point.

PREVENT FIRE - IT KILLS

FIRE SAFETY PLAN FOR HOSPITALS

A hospital is an infrastructure, which has many heat-dissipating equipment, combustible gases /fuel, chemicals, a lot of electrical wiring, etc. that are prone to fire incidents, if proper precautions are not taken. Adequate measures need to be considered, designed and practised to ensure fire safety.

Indicators like architectural designs, interior designs, electrical wiring, and appropriate equipment planning and proper waste management are to be considered while planning such fire safety measures.

COMMON CAUSES OF FIRE

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- Unattended/misuse of heating equipment
- Combustible building material, furniture.
- Repair & maintenance work involving hot work like gas cutting & welding.

FIRE SAFETY MANAGEMENT

- Fire safety requires commitment from hospital management.
- A Staff member should be made responsible for the fire prevention management system who should receive proper training from an approved institute. The said staff member should be made responsible for the fire safety and inspection and periodical reporting.
- A fire safety and evacuation plan must be drawn up and rehearsed on regular basis.

FIRE SAFETY MEASURES

The following measures would help to prevent fire and in the event of fire to minimize loss of life and property

- All the interior walls & partition in the building should be of non combustible material.
- All vertical shafts/ducts for drainage pipes, plumbing, wiring and cabling, etc. should be sealed at each floor and enclosed by 2 hours fire-resisting enclosure.
- Kitchen rooms, laundry and furniture storage rooms should be of fire resisting construction and provided with one hour fire resisting self-closing doors.
- Air conditioning should be linked with fire detection system to automatically cut off the air conditioning on the respective floor in case of a fire. Suitably placed fire dampers in the AC ducts play positive role in stopping the spread of fire.
- Transformers, air conditioning/handling units and boilers should be in separate fire resisting rooms.
- All electrical equipment including cables, light fittings, gauges, etc. should be in conformity with relevant Indian Standards.
- Every room should be provided with an overload and earth leakage trip outside it. Means of egress at least 2 m wide and exit signage should be provided as per National Building Code.
- Bare minimum flammable quantities shall be allowed to be stored and handled such as chloroform, ethyl alcohol, sprit, etc.
- Handling of such liquids shall not be permitted by unauthorized person.
- Storage for oxidizing gases like oxygen shall be kept free of flammable material. Internal stairs and shafts where practicable, be enclosed in construction having appropriate resistance to fire and smoke spread.
- Consideration shall be given to provide smoke and fire separation to form zones, allowing for progressive horizontal evacuation.
- All newly purchased upholstered furnishings, mattresses, curtains and the like shall be flame-retardant or treated with flame-retardants to minimise the risk of ignition.
- Electrical, heating and other equipment that appears faulty may present a risk of ignition or fire hazard and shall be withdrawn from service until repaired or replaced.

EXIT REQUIREMENTS

- At least two exits remotely located from each other shall be provided for each floor.
- At least one exit from each floor should lead directly outside the building/stair/a smoke proof enclosure / ramp/exit passageway
- Any patient sleeping room or any suite that includes patient sleeping room of more than 1000 sq. ft. should have at least 2 exits access doors remotely located from each other.
- The width of the exits should be sufficient for the modes of evacuation and the population using

NBC (National Building Code).

- Where progressive horizontal evacuation is to be utilized, sufficient area must be provided to house the occupants from an adjacent enclosure.
- In some parts of hospitals providing, for example, aged care, paediatric care and the care of the mentally ill, it may be appropriate to consider the provision of secure external areas to act as an open place in order to maintain the safety of the residents. Such an area should allow occupants to evacuate to a safe distance, having regard for the potential for exposure to radiant and/or convective heat, and smoke and toxic gases.
- It is preferable for patient care and ancillary areas to be separated from the exit routes by construction having appropriate resistance to smoke and fire spread.
- For multi-storey buildings stairs should, where practicable, be enclosed and consideration be given to stair pressurization having regard, amongst other things, for the rise in storeys.
- Emergency lighting should be provided in every passageway, corridor, hallway, stair, room.
- Illuminated exit signs above doors and exit direction signs to direct staff, patients and visitors to exits should be provided.

FIRE PROTECTION EQUIPMENT

- Fire detection, alarm and extinguishing systems including hydrants, sprinklers, fire detectors, portable extinguishers and efficient public address system should be provided and maintained.
- Portable fire extinguishers should be appropriately selected to address the likely types of fire but having regard for potential side effects (for e.g. dry powder extinguishers initiating asthma attacks or causing damage to electronic equipment).
- It should be appropriate to site extinguishers at staff work stations, in addition to siting them adjacent to specific fire hazards such as electrical switchboards.

FIRE EMERGENCY PROCEDURES AND TRAINING

- Emergency procedures shall documented and reviewed at least annually in accordance with appropriate Standards.
- The procedures shall be developed and documented specifically for staff in each facility, taking into account fire protection systems, facility layout and be reviewed at least annually.
- A site-specific fire safety training program shall be developed for each site. The training program shall be competency-based.

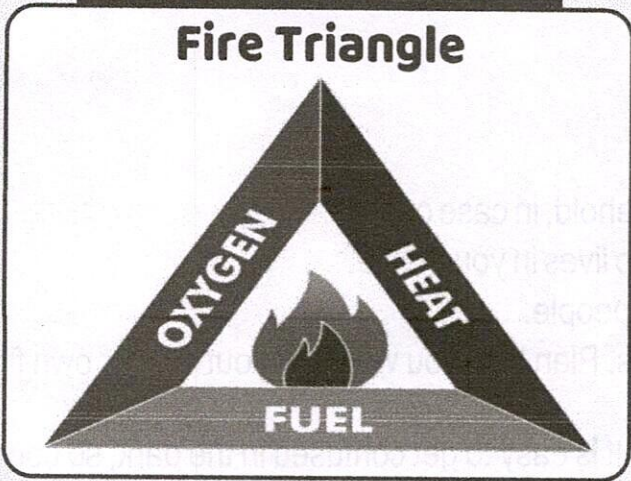
FIRE ORDERS AND EVACUATION PLANS

- Building or site-specific fire orders suitable for each building shall be developed, along with a plan showing, fire extinguishers and evacuation routes, and shall be displayed in appropriate prominent locations.
- A fire safety plan shall be prepared which shall define the fire safety strategy for the facility, and all fire protection systems present. The plan shall also include maintenance requirements and inspection procedures.

ESCAPING FROM A HIGH RISE BUILDING IN CASE OF FIRE

Mushrooming of high-rise buildings all over the country has brought a number of hazards in its wake, fire being the most serious. When fire strikes a high rise, it tends to run swiftly out of control before help arrives.

FIRE CONSTITUENTS ARE



ACTION IN CASE OF FIRE

- F**ind Location of fire
Material on fire
Type of fire
- I**nform fire service
in person shouting Aag! Aag!!
by telephone
by fire alarm
- R**estrict by removing combustible material
by evacuating premises
- E**xtinguish Assist fire service
use correct extinguisher

SELECTION OF RIGHT TYPE OF FIRE EXTINGUISHERS

TYPE OF EXTINGUISHERS	CLASS OF FIRE				
	A	B	C	D	F
WATER	✓	✗	✗	✗	✗
FOAM	✗	✓	✗	✗	✗
Co2	✗	✓	✓	✗	✗
DCP	✗	✓	✓	✓	✗
ABC	✓	✓	✓	✗	✗
WET CHEMICAL	✓	✗	✗	✗	✓



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