

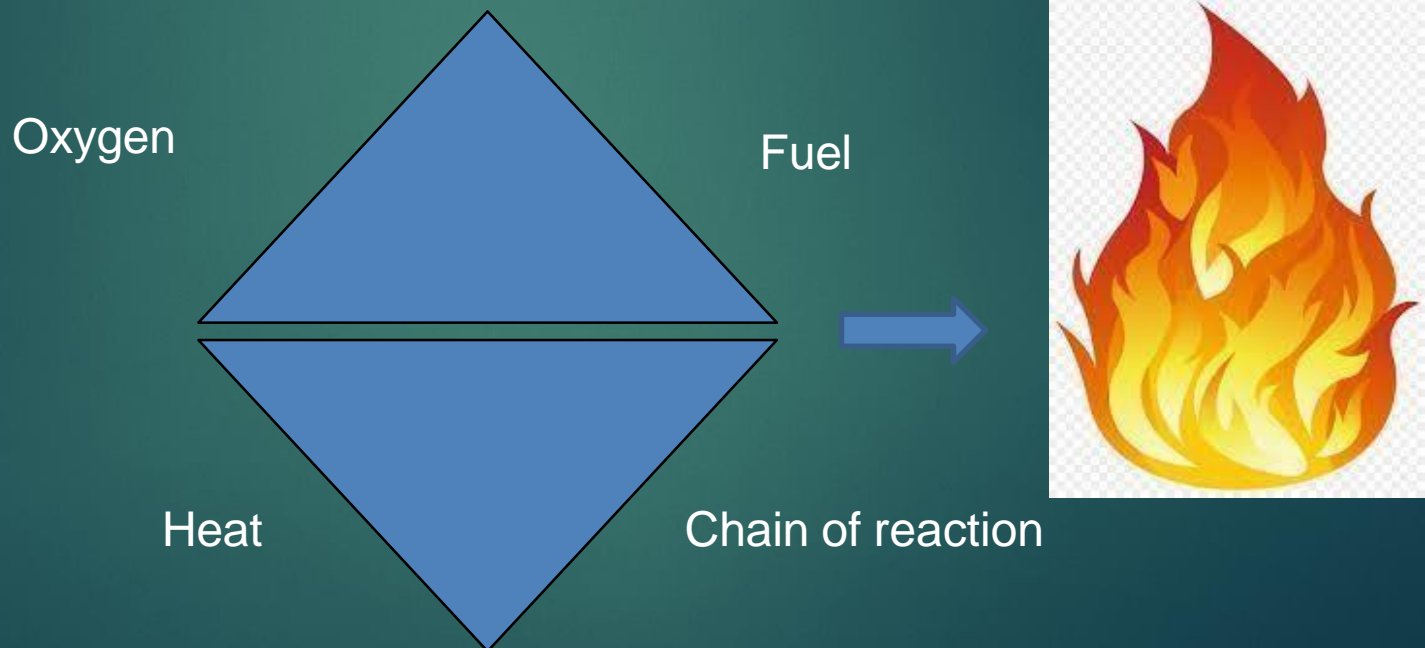
FIRE SAFETY

TOPICS

- What is Fire ?
- Methods to extinguish Fire.
- Classification of Fire and their preventions.
- Types of Fire Extinguishers.
- Anatomy of Fire Extinguishers and their operation.
- Safety guidelines while working at Chemical Labs.
- Fire Fighting decision criteria.
- Fire Survey Report

FIRE TETRAHEDRON

- Triangle is out....now Tetrahedron is in...
- Consists of 4 Sides













WAYS TO EXTINGUISH FIRE

By eliminating any one element from the fire Tetrahedron, fire can be stopped by the following methods:

- **Cooling** - by using water
- **Starvation** - by removing adjacent material from the site of fire
- **Smothering** - by cutting off air supply

CLASSIFICATION OF FIRE

Class of Fire	Type of Fire	Type of Extinguisher	Extinguisher Identification	Symbol
A	Ordinary combustibles: wood, paper, rubber, fabrics, and many plastics	Water, Dry Powder, Halon		
B	Flammable Liquids and Gases: gasoline, oils, paint, lacquer, and tar	Carbon Dioxide, Dry Powder, Halon		
C	Fires involving Live Electrical Equipment	Carbon Dioxide, Dry Powder, Halon		
D	Combustible Metals or Combustible Metal Alloys	Special Agents		No Picture Symbol 
K	Fires in Cooking Appliances that involve Combustible Cooking Media: Vegetable or Animal Oils and Fats			

TO PREVENT FIRES

Class

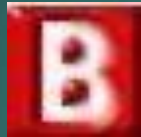


Ordinary Combustibles:

- Keep storage and working areas free of trash.
- Good House keeping practices reduce the chances of general fire.
- Place oily rags in covered containers.
- No Smoking is to be strictly adhered by all at working areas.

TO PREVENT FIRES


Class



⇒ **Inflammables Liquids & Gases:**

- Don't refuel gasoline-powered equipment in a confined space, in the presence of an open flame, or while the equipment is hot.
- Keep flammable liquids stored in a tightly closed container and away from spark producing sources.
- Use flammable liquids only in well ventilated areas.
- Never use mobile phones at Fuel stations.

TO PREVENT FIRES

Class  ⇒ **Electrical Equipments:**

- Never install a fuse rated higher than specified for the circuit.
- Investigate any appliance or electrical equipment that smells strange. Unusual odors can be the first sign of a potential fire.
- Utility lights should always have some type of wire guard over them.
- **Switch off electrical appliances when not in use.**

TO PREVENT FIRES

Class ⇒ **Electrical Equipments:**

Please do not use power plugs more than their ratings.



TO PREVENT FIRES

Class



Flammable metals:

- Knowledge of the properties of the metals and using good judgment will assist you in controlling or avoiding potential fires/reactions.
- Store inflammable metals away from the working areas.

TYPES OF PORTABLE FIRE EXTINGUISHER

- ▶ Three types of commonly used Portable fire extinguishers :
 - AFFF compound (water based)
 - Dry Chemical Powder (MAP powder)
 - CO₂

TYPES OF PORTABLE FIRE EXTINGUISHER

Types of Fire Extinguishers

<https://engineertanweerahmed.com/>



WATER



FOAM



DRY POWDER



CARBON DIOXIDE

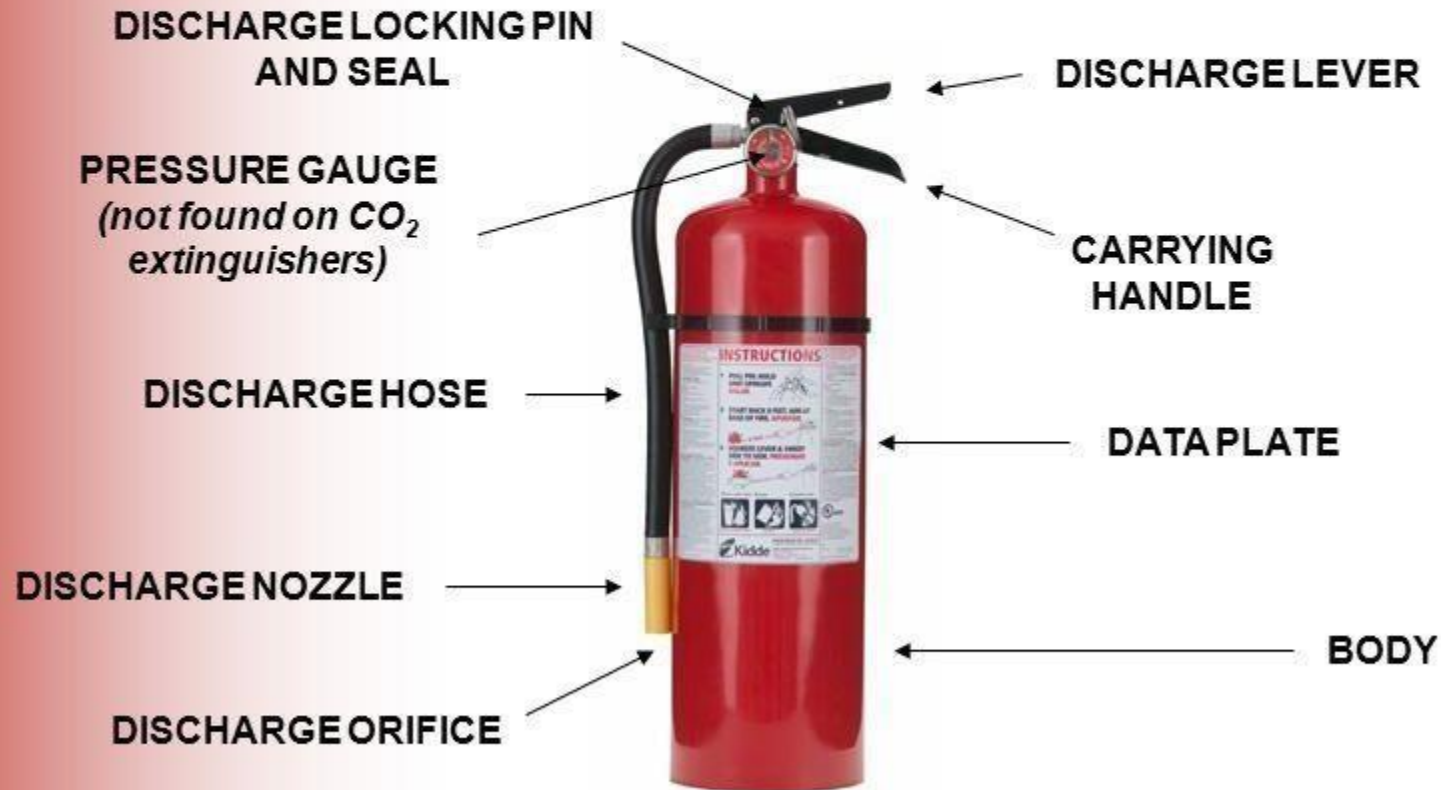


WET CHEMICAL

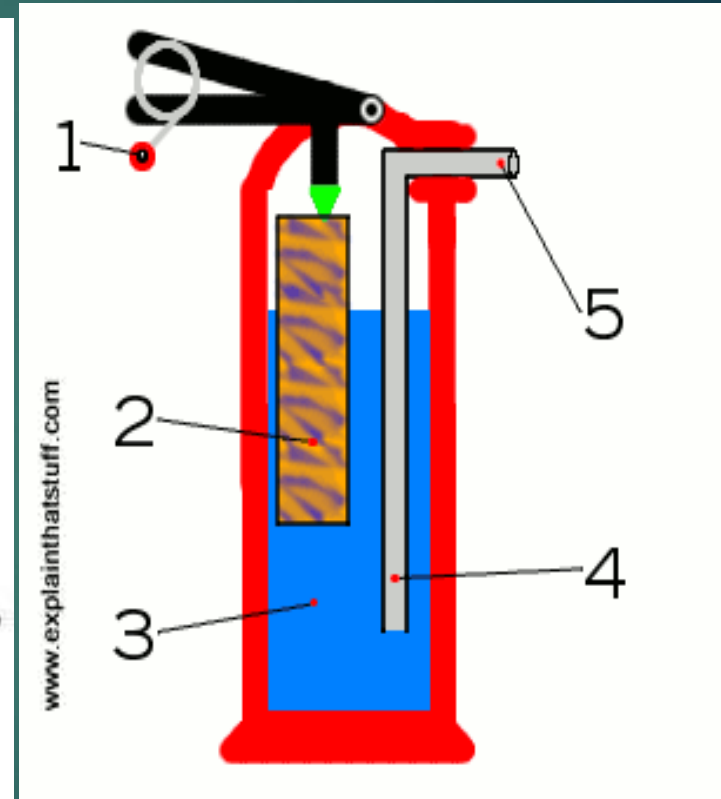


FIRE SAFETY

Anatomy of a Fire Extinguisher



Anatomy of Fire Extinguishers



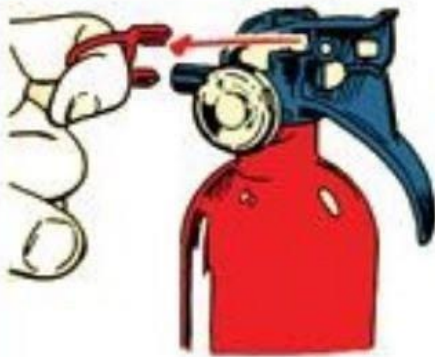
HOW TO USE PORTABLE FIRE EXTINGUISHERS

IF YOU FIGHT A FIRE, REMEMBER THE WORD
P A S S

PULL ... AIM ... SQUEEZE ... SWEEP

HOW TO USE A FIRE EXTINGUISHER

P A S S



Pull the pin
in the handle



Aim the nozzle
at the base
of the fire



Squeeze the
lever slowly



Sweep from
side to side

COMMON SAFETY

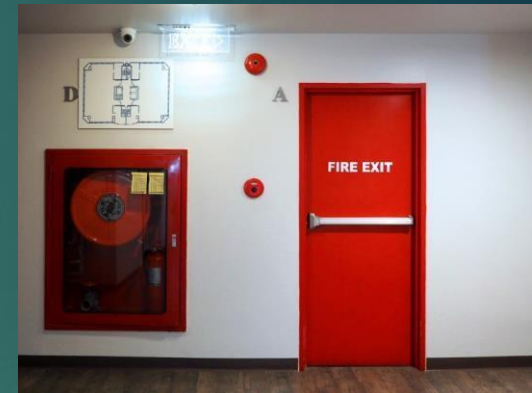
GUIDELINES AT LABS

- Use personal protective equipment.
- Chemicals received must be checked to ensure that the containers are in good condition.
- Details of new chemicals must be entered in the laboratory inventory and stored in a designated area.
- Bulk stocks must be stored in a separate building.
- Chemicals must not be placed indiscriminately in the storage shelf. They must be grouped based on their compatibility.

- In the event of an accidental breakage or seismic activity, incompatible chemicals that are stored in close proximity can mix to start a fire, hazardous fumes or explosions.
- Ensure eye washer and Safety Shower are operational.
- Ensure proper ventilation of the working area.
- Do not work alone in the laboratories particularly when performing hazardous procedures.
- Do not perform unauthorized Experiments.
- Know Emergency Escape routes of the Building.
- Know operation of Portable Fire extinguisher and their location.

FIRE FIGHTING DECISION CRITERIA

- Know Labs emergency procedures and evacuation routes
- Know locations of extinguishers in your area and how to use them
- Always sound the alarm regardless of fire size
- Avoid smoky conditions
- Ensure area is evacuated
- Never use lifts to evacuate
- Don't attempt to fight unless:
 - Alarm is sounded
 - Fire is small and contained
 - You have safe egress route (can be reached without exposure to fire)
 - Available extinguishers are rated for size and type of fire
- If in doubt, evacuate!



"DON'T ATTEMPT TO FIGHT UNLESS YOU ARE TRAINED"

KNOW FIRE SURVEY REPORT

- On an average, in India, every year, about **25,000 persons die** due to fire accidents.
- **Female** accounts for about **66%** of those killed in fire accidents.
- It is estimated that about **42 females and 19 males die every day in India due to fire accidents.**
- According to losses reported by the Indian Insurance Companies, that about **45% of the claims are due to fire losses.**
- According to another estimate about **Rs. 1000 crores are lost every year due to fire.**
- In Mumbai about **75%** of fire-related incidents occur because of short circuit caused by loose wiring in year 2017.

FIRE SAFETY IS EVERYONES BUISNESS



Thank You