

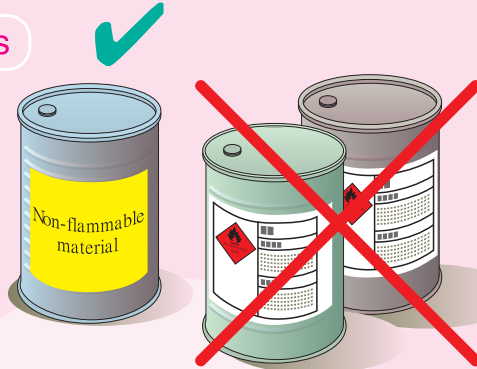
# BASIC SAFETY MEASURES



We can prevent the occurrence of fire by adopting one or more of the following control measures.

## Substitute flammable materials

Minimise the use of flammable materials in work processes. Substitute highly flammable materials for less flammable ones or formulate safer working procedures to avoid using flammable materials.

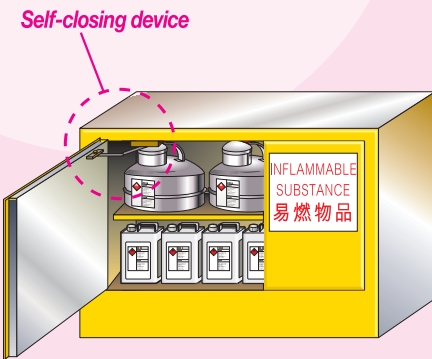


## Eliminate heat sources

Remove heat sources from places where flammable materials are stored or handled. Prohibit smoking, naked flames and work processes involving heat-generating devices. Prohibit the use of appliances that can generate sparks and take precautions against static electricity.

## Segregate flammable materials

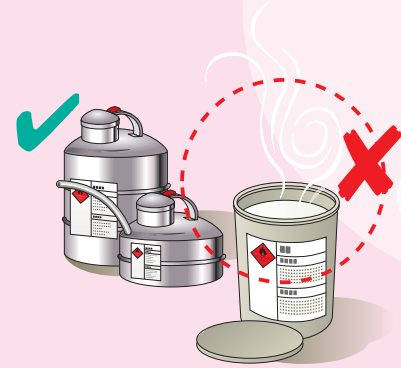
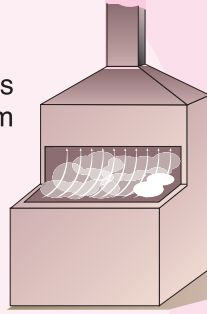
Store flammable materials separately in rooms or cabinets made of fire-resisting material. Keep work processes that use flammable materials at a safe distance from heat sources, or separate the processes in rooms built with fire-resisting material.



# BASIC SAFETY MEASURES

## Provide good ventilation

Extract swiftly flammable gas or particles produced in work processes to prevent them from accumulating to a dangerous level.



## Prevent leakage of flammable materials

Use metal container with lid and drip tray to prevent flammable materials from spilling or spreading to other parts of the workplace.

## Keep workplaces clean and tidy

Clear and clean workplaces and machinery frequently to avoid the accumulation of scraps, dust or powder produced in work processes.



Employers must conduct risk assessments on the use of flammable materials and take appropriate safety measures to avoid accidents or disasters in using them.

# EMERGENCY

## PREPAREDNESS

If incidents happen when using flammable materials, deal with them immediately to prevent further crisis. Employers should draw up emergency procedures. They should brief and supervise their employees on the emergency procedures and take appropriate action to ensure that the employees follow the procedures during an emergency. Regular drills shall also be conducted.

## Emergency preparedness includes:

- Drawing up and displaying procedures to be followed when flammable materials are leaked or spilt.
- Providing necessary emergency equipment.
- Arranging employees to receive training on emergency procedures and use of the emergency equipment.
- Setting up emergency teams to execute emergency procedures.



## Enquiry

If you wish to enquire about this leaflet or obtain more information on occupational safety and health matters, you can contact the Occupational Safety and Health Branch of the Labour Department through:

Telephone : 2559 2297 (auto-recording after office hours)  
 Fax : 2915 1410  
 E-mail : enquiry@labour.gov.hk

Information on the services offered by the Labour Department and on major labour legislation can also be found by visiting our Homepage on the Internet. Address of our Homepage is <http://www.labour.gov.hk>.

Information on the services offered by the Occupational Safety and Health Council can be obtained through their hotline 2739 9000.

## Complaints

If you have any complaints about unsafe workplaces and practices, please call the Labour Department's occupational safety and health complaint hotline at 2542 2172. All complaints will be treated in the strictest confidence.

# Working Safely with Flammable Materials



# INTRODUCTION

Many materials used in workplaces, including chemicals, are flammable. Since the storage and use of these materials pose a certain degree of risk, appropriate and adequate safety measures shall be taken. To help you understand more about flammable materials, draw up related safety management measures and avoid accidents or mishaps, this leaflet provides the following information relevant to flammable materials:

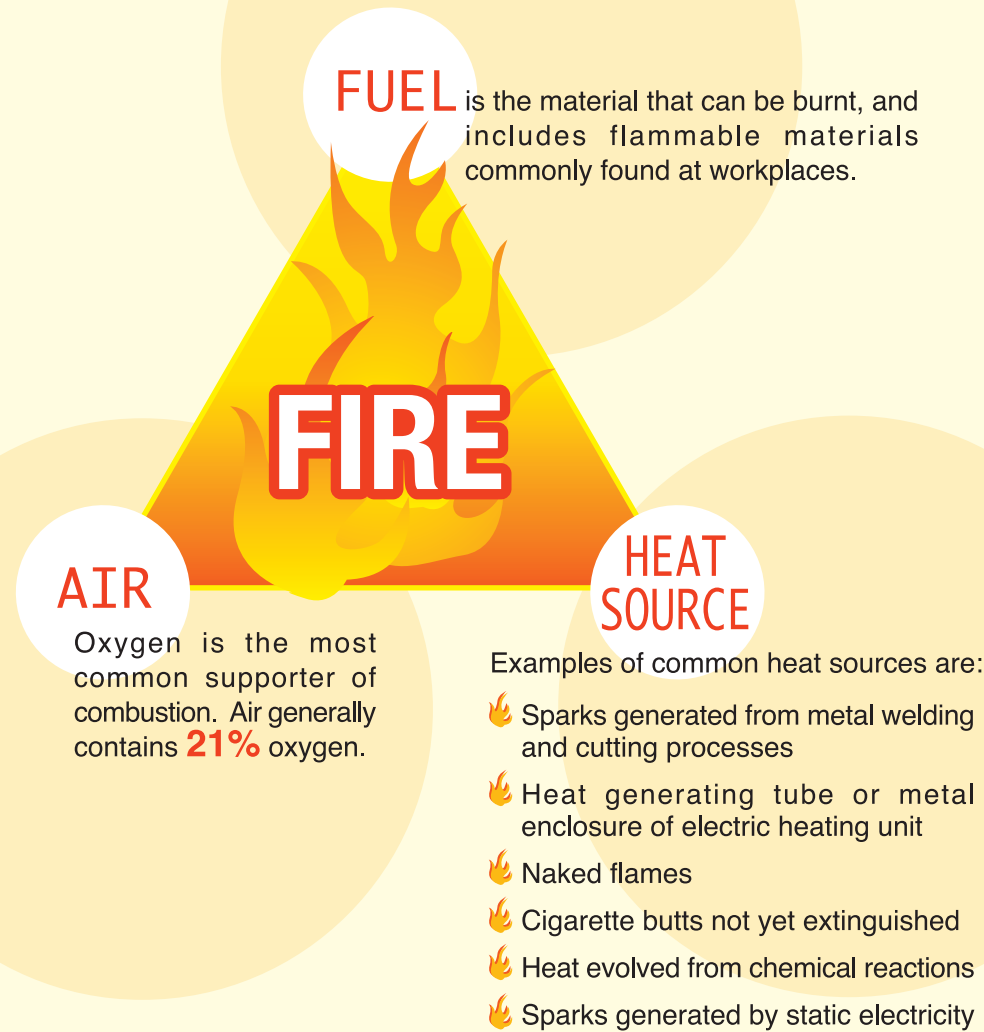
- Basic principles of combustion
- Types and risks of flammable materials
- Basic safety measures
- Emergency preparedness



SAFETY  
MANAGEMENT  
MEASURES

# BASIC PRINCIPLES OF COMBUSTION

Combustion requires three basic elements:  
**FUEL, AIR and HEAT SOURCE.**



# TYPES and RISKS OF FLAMMABLE MATERIALS

There are many types of flammable materials. They differ in properties and usage. However, they can be grouped according to their physical conditions under room temperature.

Physical condition under room temperature

## SOLID

Examples

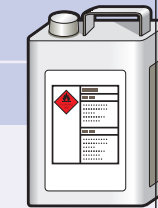
- Minute solid particles produced in work processes and powders floating in the air can mix with air to form flammable and even explosive mixtures, e.g.:

- Cotton dust
- Flour
- Coal dust
- Metal particles
- Sawdust

Possible RISKS

- Easily ignited and results in violent combustion.
- Static electricity generated by friction can cause the dusts and powders floating in dry air to burn or even explode, resulting in serious damages.
- Some solid materials, such as polyfoam, polyester filling material and textile, will release a lot of smoke and toxic fumes upon combustion.

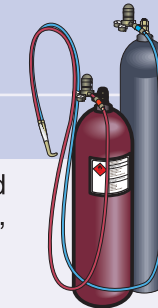
## LIQUID



- Petrol
- Thinner
- Fuels used for heating and naked flames processes

- Flammable liquids evaporate under room temperature. When the flammable vapour mixes with air and comes into contact with a heat source, it will burn. When the mixture reaches a certain proportion, it will even explode when ignited.
- Spilled flammable liquid can flow around to reach the heat source. After ignition, the flame will move rapidly back to the source of the liquid.
- Flammable liquid can spill out and enlarge the area of fire, causing more serious disasters.

## GAS



- Fuel used in naked flames processes, e.g. LPG
- Gas used in high-temperature processing, welding or cutting, e.g. acetylene gas used in gas welding

- Flammable gases are usually stored in metal gas cylinders under high pressure. Leakage of small amount of gas can quickly fill up a large space and form explosive mixtures.
- In gas welding and flame cutting work, if a gas supply system is not equipped with non-return valves and flashback arrestors, lighting up the blowpipe can trigger off a flashback of fire in the system causing a fire or explosion of the gas cylinders.

## MIST

- Mist (including aerosols) produced by atomization of flammable liquid, mixes with air to form flammable or even explosive mixtures, e.g. :

- Spray
- Mist produced by ultrasonic vibration

- Mist floating in air, when in contact with ignition source, will burn or even cause severe explosion and result in serious damage.



FLAMMABLE  
MATERIALS