



Abrol TechSkill Academy

Fire Safety Awareness & Emergency Response Training

1-Month Pro Level Certification





WELCOME MESSAGE

Welcome to the Fire Safety & Emergency Response Training Program

Welcome to the **Fire Safety & Emergency Response – 1-Month Pro Level Certification** offered by **ABROL TechSkill Academy**.

Fire safety is more than just learning how to use a fire extinguisher—it is about protecting lives, property, and the environment. Every home, office, industry, and public place relies on individuals who understand how to prevent fires and respond safely during emergencies.

This course has been specially designed for **students, freshers, job seekers, working professionals, and anyone interested in building a career in the fire and safety industry**.

Whether you are starting your journey or already working in the field, this training will help you develop a strong foundation in fire safety principles, emergency response, fire prevention, and workplace safety practices.

Through simple classroom learning, practical demonstrations, and hands-on activities, you will gain the confidence to identify fire hazards, use fire safety equipment correctly, respond effectively during emergencies, and contribute to creating a safer workplace.

We hope this course inspires you to build a safer future for yourself and those around you.

Learn with confidence. Practice with responsibility. Protect with knowledge.

We wish you every success in your learning journey and future career.

Team **ABROL TechSkill Academy**



COURSE MOTIVE

The Fire Safety & Emergency Response – 1-Month Pro Level Certification is designed to provide participants with a clear understanding of the fundamentals of fire safety and emergency response.

For Beginners

This course serves as an excellent starting point for students, freshers, and job seekers who want to explore the field of fire safety. It introduces the basic concepts of fire science, fire prevention, firefighting equipment, emergency response, evacuation procedures, first aid, and workplace safety. It also helps participants understand the career opportunities available in the fire and safety industry.

For Working Professionals

For professionals already working in industries, factories, commercial buildings, security services, maintenance, or facility management, this course helps strengthen existing knowledge, refresh essential safety practices, and enhance professional skills. It also supports career growth by improving competency and adding a recognized certification to their professional profile.

Our Objective

Our objective is to create safety-conscious individuals who can:

- Understand the fundamentals of fire safety.
- Identify and eliminate common fire hazards.
- Respond safely and effectively during emergencies.
- Use basic fire protection equipment with confidence.
- Promote a culture of safety at home and in the workplace.
- Build a strong foundation for advanced studies and career opportunities in Fire & Safety.

**Knowledge is the first step towards prevention.
Prevention is the first step towards safety.**

Fire Safety Awareness & Emergency Response Training

1-Month Pro Level Certification

Duration: 22 Days

Day(s)	Module No.	Module Name
Day 1	Module 1	Introduction to Fire Safety & Emergency Response
Day 2 – 3	Module 2	Basics of Fire & Fire Science
Day 4	Module 3	Fire Triangle & Fire Tetrahedron
Day 5	Module 4	Classes of Fire
Day 6 – 7	Module 5	Fire Extinguishers
Day 8	Module 6	Fire Extinguisher Inspection, Maintenance & Practical Operation
Day 9 – 10	Module 7	Fire Detection & Fire Alarm Systems
Day 11 – 12	Module 8	Fixed Fire Fighting Systems
Day 13	Module 9	Emergency Response & Fire Emergency Procedures
Day 14	Module 10	Fire Evacuation Procedures & Assembly Point Management
Day 15	Module 11	Basic First Aid During Fire Emergencies
Day 16	Module 12	Personal Protective Equipment (PPE) & Fire Safety Signages
Day 17 – 18	Module 13	Electrical Fire Safety & LPG Cylinder Safety
Day 19	Module 14	Fire Prevention in Homes, Offices & Industries
Day 20	Practical Session	Fire Extinguisher Demonstration, Fire Alarm, Hydrant System & PPE Demonstration
Day 21	Revision	Complete Course Revision & Mock Test
Day 22	Final Assessment	Theory Examination, Practical Assessment & Course Feedback

Module 1

Introduction to Fire Safety

Learning Objectives

After completing this module, learners will be able to:

- Understand the meaning of fire safety.
- Explain why fire safety is important.
- Identify common causes of fire.
- Recognize common fire hazards.
- Understand the role of every individual in preventing fires.

1. What is Fire Safety?

Fire safety is the set of practices, precautions, and procedures used to prevent fires, reduce the risk of fire accidents, protect people and property, and respond safely if a fire occurs.

Fire safety is not only about extinguishing fires after they start. It is mainly about preventing fires from happening in the first place. Every home, office, school, hospital, factory, shopping mall, and public place follows fire safety measures to protect lives and valuable property.

Fire safety includes:

- Identifying fire hazards
- Preventing fire incidents
- Installing fire protection equipment
- Training people to respond during emergencies
- Conducting regular fire drills
- Maintaining firefighting systems

A safe workplace is one where everyone understands fire risks and knows how to act during an emergency.

2. Why is Fire Safety Important?

Fire accidents can happen at any time and often without warning. A small spark can quickly become a large fire if it is not controlled immediately.

Fire safety is important because it helps to:

a) Protect Human Life

The primary goal of fire safety is to save lives. Fire can produce intense heat, smoke, and toxic gases that may cause serious injuries or death within minutes.

b) Protect Property

Fire can destroy buildings, machinery, vehicles, equipment, important documents, and valuable assets. Proper fire safety measures reduce damage and financial loss.

c) Protect the Environment

Many fires release harmful smoke and chemicals into the environment. Preventing fires helps reduce pollution and protects natural resources.

d) Ensure Business Continuity

A major fire can stop business operations for days or even months. Fire safety planning helps organizations continue their work with minimal disruption.

e) Meet Legal Requirements

Government regulations require industries, offices, hospitals, schools, and commercial buildings to maintain proper fire safety systems and emergency procedures.

3. Common Causes of Fire

Most fires occur due to unsafe practices or negligence. Understanding these causes helps prevent future incidents.

Electrical Short Circuit

Damaged wiring, overloaded sockets, loose electrical connections, or faulty electrical equipment can generate excessive heat and start a fire.

Example:

Using multiple high-power appliances in one extension board may overload the circuit.

Gas Leakage

Leaks from LPG cylinders or gas pipelines can create a highly flammable atmosphere. Even a small spark may result in an explosion.

Example:

Lighting a match immediately after smelling LPG gas can cause a fire.

Smoking Materials

Improperly discarded cigarette butts, matches, or smoking near flammable materials can easily ignite a fire.

Example:

Throwing a burning cigarette into a dustbin containing paper.

Cooking Accidents

Unattended cooking, overheated oil, or leaking gas are common causes of kitchen fires.

Example:

Leaving oil on the stove without supervision.

Welding and Hot Work

Grinding, welding, and cutting operations produce sparks that can ignite nearby combustible materials.

Example:

Performing welding near paint containers or fuel storage.

Improper Storage of Flammable Materials

Petrol, diesel, paints, thinners, chemicals, LPG cylinders, and solvents should be stored safely.

Poor storage greatly increases fire risk.

Human Negligence

Carelessness is one of the biggest causes of fire accidents.

Examples include:

- Ignoring safety instructions
- Leaving electrical equipment switched on
- Blocking emergency exits
- Not reporting unsafe conditions

4. Fire Hazards

A fire hazard is any condition, material, or activity that increases the possibility of a fire.

Electrical Hazards

Examples:

- Exposed wires
- Loose electrical connections
- Damaged plugs
- Overloaded extension boards

Chemical Hazards

Flammable liquids, gases, and chemicals must be handled carefully because they ignite easily.

Examples:

Petrol, thinner, alcohol, LPG, diesel.

Housekeeping Hazards

Poor housekeeping allows combustible waste to accumulate.

Examples:

- Paper waste
- Wooden packing
- Plastic waste
- Oil-soaked cloth

Good housekeeping significantly reduces fire risk.

Mechanical Hazards

Machines with excessive friction, overheating motors, or poor maintenance may generate heat and start fires.

Storage Hazards

Improper stacking of combustible materials or blocking fire exits creates additional fire risks.

Storage areas should always remain clean, organized, and accessible.

5. Objectives of Fire Prevention

The main objectives of fire prevention are:

- Prevent fires before they start.
- Reduce the spread of fire.
- Protect people from injury.
- Protect buildings and equipment.
- Reduce financial losses.
- Ensure quick evacuation during emergencies.
- Create a safe working environment.

Remember:

Preventing one fire is always better than extinguishing one.

6. Responsibilities of Every Individual

Fire safety is everyone's responsibility, not only the fire department or safety officer.

Every employee should:

- Follow all fire safety rules.
- Keep work areas clean.
- Never block emergency exits.
- Know the location of fire extinguishers.
- Know emergency assembly points.
- Report unsafe conditions immediately.
- Participate actively in fire drills.
- Stay calm during emergencies.
- Help others only when it is safe to do so.

Every responsible employee contributes to a safer workplace.

Key Takeaways

- ✓ Fire safety protects lives and property.
- ✓ Most fires can be prevented through safe practices.
- ✓ Early reporting of hazards reduces accidents.
- ✓ Good housekeeping is one of the simplest fire prevention methods.
- ✓ Every individual has an important role in fire safety.

Safety Tips

- Never overload electrical sockets.
- Switch off electrical equipment when not in use.
- Keep combustible materials away from heat sources.
- Never block emergency exits.
- Learn the location of fire extinguishers before an emergency occurs.
- Report damaged electrical equipment immediately.

Module 2

BASICS OF FIRE & FIRE SCIENCE

Learning Objectives

After completing this module, learners will be able to:

- Understand what fire is.
- Explain the science behind fire.
- Identify the essential elements required for a fire to occur.
- Differentiate between controlled and uncontrolled fire.
- Understand the stages of fire development.
- Recognize different methods of heat transfer.

1. What is Fire?

Fire is a **chemical reaction** known as **combustion**. It occurs when a combustible material (fuel) combines rapidly with oxygen in the presence of sufficient heat. During this reaction, heat, light, smoke, and gases are released.

Fire is useful when it is controlled, such as for cooking food, generating electricity, or manufacturing products. However, when fire spreads beyond control, it becomes dangerous and can cause injuries, loss of life, and damage to property.

Example

- A gas stove produces a controlled fire for cooking.
- A short circuit causing a building to catch fire is an uncontrolled fire.

2. What is Fire Science?

Fire Science is the study of how fires start, spread, behave, and how they can be controlled or extinguished safely.

Fire science helps firefighters, safety officers, engineers, and workers understand the causes of fire and the best methods to prevent and control it.

It includes:

- Understanding combustion.
- Studying fire behaviour.
- Identifying fire hazards.
- Learning fire prevention techniques.
- Understanding firefighting methods.
-

Understanding fire science helps reduce accidents and improves emergency response.

3. What is Combustion?

Combustion is the process of burning. It is a chemical reaction between fuel and oxygen in the presence of heat.

When combustion occurs, it produces:

- Heat
- Flames
- Smoke
- Light
- Various gases such as carbon dioxide and water vapour.

Some fires may also produce poisonous gases such as carbon monoxide if combustion is incomplete.

Example

Burning wood in a fireplace is an example of combustion.

4. Essential Elements Required for Fire

A fire cannot start unless three essential elements are present together. These are:

Heat

Heat is the energy needed to raise the temperature of a material until it reaches its ignition point.

Common sources of heat include:

- Open flames
- Hot machinery
- Friction
- Electrical sparks
- Welding operations
- Smoking materials

Without heat, fire cannot start.

Fuel

Fuel is any material that can burn.

Examples include:

- Wood
- Paper
- Petrol
- Diesel
- LPG
- Plastic
- Cloth
- Cooking oil

Different fuels burn differently depending on their properties.

Oxygen

Oxygen supports combustion.

The air around us contains approximately 21% oxygen, which is enough to support most fires.

If oxygen is removed, the fire will eventually go out.

Practical Example

Cover a burning candle with a glass jar.

After a short time, the flame extinguishes because the oxygen inside the jar is used up.

5. Fire Triangle

The Fire Triangle explains the three basic elements required for fire.

The three sides of the Fire Triangle are:

- Heat
- Fuel
- Oxygen
-

If any one of these elements is removed, the fire cannot continue burning.

Example

1. Water cools the fire and removes heat.
2. Foam separates oxygen from the fuel.
3. Removing combustible material removes the fuel source.
4. Firefighters extinguish fires by removing one or more sides of the Fire Triangle.

6. Controlled Fire and Uncontrolled Fire

Controlled Fire

A controlled fire is intentionally created and safely managed for a useful purpose.

Examples:

- Gas stove
- Industrial boiler
- Furnace
- Candle during a ceremony

Controlled fires are constantly monitored.

Uncontrolled Fire

An uncontrolled fire spreads without control and becomes dangerous.

Examples:

- Factory fire
- Electrical fire
- Forest fire
- House fire

These fires require immediate emergency response.

7. Stages of Fire Development

A fire usually develops in four stages.

Stage 1 – Incipient Stage

This is the beginning stage.

Characteristics:

- Small flame
- Low heat
- Little smoke

At this stage, a portable fire extinguisher can usually control the fire.

Stage 2 – Growth Stage

The fire begins spreading rapidly.

Characteristics:

- Increasing heat
- Thick smoke
- Flames spread to nearby materials

Immediate action is necessary.

Stage 3 – Fully Developed Stage

The fire reaches its maximum intensity.

Characteristics:

- Extremely high temperature
- Large flames
- Heavy smoke
- Serious structural damage

Professional firefighters are usually required.

Stage 4 – Decay Stage

The available fuel starts reducing.

Characteristics:

- Flames become smaller
- Heat gradually decreases
- Hidden hot spots may still exist

Re-ignition is possible if proper cooling is not done.

8. Heat Transfer

Heat spreads from one place to another through three methods.

Conduction

Heat travels through solid materials.

Example:

A metal spoon becomes hot when left inside a cup of hot tea.

Convection

Heat travels through liquids and gases.

Example:

Hot smoke rises towards the ceiling during a fire.

This is why smoke detectors are usually installed near ceilings.

Radiation

Heat travels through electromagnetic waves without direct contact.

Example:

Feeling heat from a bonfire while standing several metres away.

Radiation can ignite nearby combustible materials.

Key Takeaways

- ✓ Fire is a chemical reaction called combustion.
- ✓ Heat, Fuel, and Oxygen are essential for fire.
- ✓ Fire Science helps us understand and prevent fires.
- ✓ Fire develops through four stages.
- ✓ Heat spreads by conduction, convection, and radiation.
- ✓ Understanding fire behaviour helps save lives.

Safety Tips

- Never leave open flames unattended.
- Keep combustible materials away from heat sources.
- Report overheating electrical equipment immediately.
- Learn the location of fire extinguishers.
- Act quickly when a fire is in its early stage.
- Never underestimate a small fire.

Module 3

FIRE TRIANGLE & FIRE TETRAHEDRON

Learning Objectives

After completing this module, learners will be able to:

- Understand the concept of the Fire Triangle.
- Identify the three essential elements required for fire.
- Explain the Fire Tetrahedron and the chain chemical reaction.
- Understand how different firefighting methods extinguish fires.
- Apply the Fire Triangle concept in real-life situations.

1. Introduction to the Fire Triangle

The **Fire Triangle** is one of the most important concepts in fire safety. It explains that a fire can only start and continue burning when **three essential elements** are present together.

These three elements are:

- **Heat**
- **Fuel**
- **Oxygen**

If any one of these elements is removed, the fire cannot continue and will be extinguished.

Understanding the Fire Triangle helps us prevent fires and choose the correct method to extinguish them.

2. Element 1 – Heat

Heat is the energy required to raise the temperature of a material until it reaches its ignition temperature, the point at which it catches fire.

Common Sources of Heat

- Electrical short circuits
- Open flames
- Welding and cutting operations
- Hot machinery
- Friction between moving parts
- Smoking materials
- Cooking equipment
- Lightning

Example

If paper is placed near a burning candle for a long time, it absorbs heat until it reaches its ignition temperature and starts burning.

Safety Tip

Always keep combustible materials away from heat sources.

3. Element 2 – Fuel

Fuel is any material that can burn when sufficient heat and oxygen are present.

Fuel may exist as a:

Solid Fuel

Examples:

- Wood
- Paper
- Cloth
- Plastic
- Rubber
- Coal

Liquid Fuel

Examples:

- Petrol
- Diesel
- Kerosene
- Paint
- Thinner
- Cooking oil

Gaseous Fuel

Examples:

- LPG
- CNG
- Hydrogen
- Acetylene
- Natural Gas

Different fuels burn at different rates depending on their properties.

Safety Tip

Store flammable fuels only in approved containers and away from heat sources.

4. Element 3 – Oxygen

Oxygen is a gas present in the atmosphere that supports combustion.

The air around us contains approximately **21% oxygen**, which is enough for most fires to burn continuously.

Without oxygen, combustion cannot continue.

Practical Demonstration

Light a candle and place a glass jar over it.

Within a few seconds, the flame goes out because the oxygen inside the jar has been consumed.

Safety Tip

Never enter a confined area where oxygen levels are unknown.

5. How the Fire Triangle Works

Imagine making tea on a gas stove.

- LPG acts as the fuel.
- The lighter provides the heat.
- Oxygen comes from the surrounding air.

All three elements are present, so the flame continues to burn.

If the gas supply is turned off, the fuel is removed and the flame goes out.

If a lid is placed over a small oil fire, oxygen is reduced and the fire is extinguished.

If water cools certain fires sufficiently, the heat is removed and combustion stops.

6. Fire Tetrahedron

Modern fire science explains fire using the **Fire Tetrahedron**.

The Fire Tetrahedron includes four essential elements:

- Heat
- Fuel
- Oxygen
- Chain Chemical Reaction

The fourth element explains why some fires continue burning even after part of the heat has been reduced.

7. Chain Chemical Reaction

When a fire burns, many chemical reactions occur continuously.

These reactions produce additional heat, which keeps the fire burning and creates more flames. This continuous process is called the **Chain Chemical Reaction**.

If this chain reaction is interrupted, the fire will stop burning.

Certain fire extinguishers, such as **Dry Chemical Powder (DCP)** extinguishers, work by breaking this chemical reaction.

Example

Think of a row of standing dominoes. When one domino falls, it knocks down the next one. If one domino is removed, the chain stops. Fire behaves in a similar way.

8. Methods of Extinguishing Fire

A. Cooling Method

Removes Heat

Common Extinguishing Agent:

- Water

Example:

Water cools burning wood until it falls below its ignition temperature.

B. Smothering Method

Removes Oxygen

Common Extinguishing Agents:

- Foam
- Fire Blanket
- CO₂

Example:

Covering a small pan fire with a lid cuts off the oxygen supply.

C. Starvation Method

Removes Fuel

Example:

Turning off an LPG cylinder valve stops the fuel supply.

Removing nearby combustible materials also prevents fire from spreading.

D. Chemical Inhibition

Stops the Chain Chemical Reaction

Common Extinguishing Agent:

- Dry Chemical Powder (DCP)

This method is particularly effective for electrical and flammable liquid fires.

9. Importance of Understanding the Fire

Triangle Understanding the Fire Triangle helps people:

- Prevent fires before they start.
- Select the correct fire extinguisher.
- Respond safely during emergencies.
- Reduce fire damage.
- Protect lives and property.

Every safety professional should understand these principles thoroughly.

Key Takeaways

- ✓ Fire needs Heat, Fuel, and Oxygen.
- ✓ Modern fire science adds a fourth element—the Chain Chemical Reaction.
- ✓ Removing any one element will extinguish the fire.
- ✓ Different extinguishing agents work by removing different elements of the Fire Triangle or Fire Tetrahedron.
- ✓ Understanding these concepts helps prevent fire accidents.

Safety Tips

- Never store fuel near heat sources.
- Turn off LPG cylinders when not in use.
- Maintain electrical equipment regularly.
- Keep fire extinguishers easily accessible.
- Learn which extinguisher is suitable for different types of fires.
- Report fuel leaks immediately.

Module 4

CLASSES OF FIRE

Learning Objectives

After completing this module, learners will be able to:

- Understand what fire classes are.
- Identify the different classes of fire.
- Recognize the types of fuel involved in each class.
- Select the appropriate fire extinguisher for different fire classes.
- Understand the dangers of using the wrong extinguishing agent.

1. Introduction to Classes of Fire

Not all fires are the same. Different materials burn in different ways, and each type of fire requires a specific method of extinguishing.

To make firefighting safer and more effective, fires are classified into different categories known as **Classes of Fire**.

Knowing the class of fire helps us choose the correct fire extinguisher and prevents the fire from becoming more dangerous.

Using the wrong extinguisher can increase the fire, cause explosions, or result in serious injuries.

2. Class A Fire – Ordinary Combustible Materials

Class A fires involve ordinary combustible solid materials that burn and usually leave ash after burning.

Examples

- | | | |
|-------------|----------|----------------------------------|
| • Wood | • Cloth | • Plastic (ordinary combustible) |
| • Paper | • Cotton | • Furniture |
| • Cardboard | • Rubber | • Dry leaves |

These are the most common fires found in homes, schools, offices, hotels, and warehouses.

Suitable Fire Extinguishers

- Water Extinguisher
- Foam Extinguisher
- ABC Dry Chemical Powder (DCP)

Do Not Use

There are generally no restrictions on using water for ordinary Class A fires unless electricity is involved.

Example

A wooden table catches fire due to a candle left burning. This is a **Class A fire**.

3. Class B Fire – Flammable Liquids

Class B fires involve flammable or combustible liquids.

These liquids do not burn directly. Their vapours ignite and burn.

Examples

- Petrol
- Diesel
- Kerosene
- Paint
- Thinner
- Alcohol
- Solvents
- Cooking oil (small spills, not deep fat fryers)

Suitable Fire Extinguishers

- Foam Extinguisher
- CO₂ Extinguisher
- ABC Dry Chemical Powder (DCP)

Never Use

Do not use water.

Water can spread burning liquid and make the fire much larger.

Example

A petrol spill catches fire at a fuel station. This is a **Class B fire**.

4. Class C Fire – Flammable Gases

What is a Class C Fire?

Class C fires involve flammable gases.

Gas fires are highly dangerous because leaking gas can spread quickly and explode.

Examples

- LPG
- CNG
- PNG
- Hydrogen
- Acetylene
- Methane

Suitable Fire Extinguishers

- FDry Chemical Powder (DCP)
- CO₂ Extinguisher (for small gas fires after isolating the source)

Important Safety Rule

The first priority is to **stop the gas supply**.

Never extinguish a gas flame unless the gas leak has been controlled, as unburnt gas can accumulate and explode.

Example

An LPG cylinder pipe leaks and catches fire. This is a **Class C fire**.

5. Class D Fire – Combustible Metals

What is a Class D Fire?

Class D fires involve combustible metals.

These fires are rare but extremely dangerous because some burning metals react violently with water.

Examples

- Magnesium
- Potassium
- Aluminium powder
- Sodium
- Lithium
- Titanium

These fires are commonly found in metal processing industries, laboratories, and manufacturing plants.

Suitable Fire Extinguishers

- Special Class D Dry Powder

Never Use

- Water
- Foam
- CO₂

These agents may react with the burning metal and make the fire worse.

Example

Magnesium shavings catch fire during machining. This is a **Class D fire**.

6. Electrical Fire (Energized Electrical Equipment)

What is an Electrical Fire?

Electrical fires involve equipment that is still connected to an electrical power supply. Although not always classified separately in every standard, electrical fires require special handling.

Examples

- Electrical panels
- Motors
- UPS systems
- Distribution boards
- Wiring
- Air conditioners
- Computers

Suitable Fire Extinguishers

- CO₂ Extinguisher
- Dry Chemical Powder (DCP)

Never Use

- Water on live electrical equipment.
- Water conducts electricity and may cause electric shock.

Example

A short circuit causes a computer server to catch fire. This is treated as **an electrical fire**.

7. Class K (or Class F) Fire – Cooking Oils and Fats

What is a Class K/Class F Fire?

These fires involve high-temperature cooking oils and animal or vegetable fats.

They are common in restaurants, hotels, commercial kitchens, and food processing units.

Examples

- Deep fryer oil
- Vegetable oil
- Ghee
- Cooking fat

Suitable Fire Extinguishers

- Wet Chemical Extinguisher

Never Use

- Water. Water causes burning oil to splash violently, spreading the fire and causing serious burns.

Example

A deep fryer catches fire in a restaurant kitchen. This is a **Class K (Class F) fire**.

8. Why is it Important to Identify the Correct Fire Class?

Identifying the fire class helps us:

- Choose the correct fire extinguisher.
- Reduce fire damage.
- Prevent injuries.
- Avoid explosions.
- Protect equipment and property.
- Control the fire quickly and safely.

Incorrect firefighting methods can make a small fire become a major emergency.

Summary of Fire Classes

Fire Class	Fuel Involved	Suitable Extinguishers
Class A	Wood, Paper, Cloth, Plastic	Water, Foam, ABC DCP
Class B	Petrol, Diesel, Paint, Solvents	Foam, CO ₂ , ABC DCP
Class C	LPG, CNG, PNG, Hydrogen	DCP, CO ₂
Class D	Magnesium, Sodium, Lithium	Special Class D Powder
Electrical	Live Electrical Equipment	CO ₂ , DCP
Class K/F	Cooking Oils & Fats	Wet Chemical

Key Takeaways

- ✓ Different fires require different extinguishing methods.
- ✓ Always identify the fuel involved before selecting an extinguisher.
- ✓ Water is suitable for ordinary combustible materials but should never be used on live electrical or burning oil fires.
- ✓ Flammable gas fires require isolation of the gas supply before extinguishment whenever possible.
- ✓ Correct identification of fire classes helps save lives and property.

Safety Tips

Learn the fire classes before using any extinguisher.
Read the extinguisher label before use.
Never throw water on burning oil or energized electrical equipment.
Keep LPG cylinders in well-ventilated areas.
Report fuel leaks immediately.
Use only approved extinguishers for metal fires.

Module 5

FIRE EXTINGUISHERS

Learning Objectives

After completing this module, learners will be able to:

- Understand what a fire extinguisher is.
- Explain the importance of portable fire extinguishers.
- Identify different types of fire extinguishers.
- Select the correct extinguisher for different classes of fire.
- Understand the colour coding used on fire extinguishers.
- Learn the PASS technique for operating a fire extinguisher.
- Understand important safety precautions while using an extinguisher.

1. What is a Fire Extinguisher ?

A **fire extinguisher** is a portable firefighting device designed to control or extinguish a small fire during its early stage before it spreads.

Fire extinguishers are the **first line of defence** against fire emergencies. They allow trained persons to quickly control a fire until the fire brigade arrives.

A fire extinguisher should only be used when:

- The fire is small.
- The fire has not spread rapidly.
- You have a safe escape route behind you.
- You know how to operate the extinguisher.
-

If the fire becomes uncontrollable, evacuate immediately and call the Fire Department.

2. Why are Fire Extinguishers Important?

Fire extinguishers play an important role in protecting lives and property.

They help to:

- Control small fires before they become major fires.
- Protect people from injury.
- Reduce property damage.
- Provide valuable time for evacuation.
- Prevent business interruptions.
- Save valuable equipment and documents.

Many major fires could have been prevented if an extinguisher had been used correctly during the early stage.

3. Parts of a Fire Extinguisher

Although different extinguishers vary slightly in design, most portable extinguishers have the following parts:

Cylinder

The metal container that stores the extinguishing agent.

Handle

Used for holding and carrying the extinguisher.

Operating Lever

When pressed, it releases the extinguishing agent.

Safety Pin

Prevents accidental discharge.

Always remove the safety pin before operating the extinguisher.

Tamper Seal

A plastic seal attached to the safety pin.

It shows whether the extinguisher has already been used.

Pressure Gauge (where provided)

Shows whether the extinguisher is properly pressurized.

Green Zone = Ready for use

Red Zone = Low or High Pressure (Requires Inspection)

Hose and Nozzle

Directs the extinguishing agent towards the fire.

Always point the nozzle at the base of the fire, not at the flames.

4. Types of Fire Extinguishers

A. Water Fire Extinguisher

Extinguishing Agent: Water

Suitable For: Class A Fires

Examples: Paper • Wood • Cloth • Cardboard • Furniture

Working Principle: Water cools the burning material below its ignition temperature.

Never Use On: Electrical Fires • Petrol Fires • Diesel Fires • Cooking Oil Fires

B. Foam Fire Extinguisher

Extinguishing Agent: Aqueous Film Forming Foam (AFFF)

- **Suitable For:** • Class A Fires. • Class B Fires

Working Principle: Foam forms a blanket over the burning liquid and cuts off the oxygen supply.

Never Use On: Live electrical equipment.

C. Carbon Dioxide (CO₂) Fire Extinguisher

Extinguishing Agent: Carbon Dioxide Gas

- **Suitable For:** • Electrical Fires • Class B Fires

Working Principle: CO₂ displaces oxygen around the fire and helps cool the burning surface.

Advantages

- Leaves no residue.
- Safe for electrical equipment.
- Ideal for offices, computer rooms, and electrical panels.

Safety Precaution

Never hold the discharge horn during operation, as it becomes extremely cold and may cause cold burns.

D. Dry Chemical Powder (ABC Type)

Extinguishing Agent: Mono Ammonium Phosphate Powder

- **Suitable For:** • Class A • Class B • Class C. • Electrical Fires

This is the most commonly used extinguisher because it can extinguish multiple classes of fire.

Working Principle: The powder interrupts the chain chemical reaction and separates the fuel from oxygen.

Limitation : Leaves powder residue after use.

E. Wet Chemical Fire Extinguisher

Extinguishing Agent: Wet Chemical Solution

- **Suitable For:** • Class K (Cooking Oil & Fat Fires)

This is the most commonly used extinguisher because it can extinguish multiple classes of fire.

Working Principle: The chemical reacts with hot cooking oil to form a soap-like layer, cooling the oil and preventing re-ignition.

- **Limitation :** • Restaurants • Hotels • Commercial Kitchens • Food Courts

F. Clean Agent Fire Extinguisher

- **Suitable For:** • Sensitive electronic equipment
- **Examples :** • Data Centers • Server Rooms • Laboratories • Telecommunication Equipment
- **Advantages :** • Leaves no residue. • Does not damage electronics. • Does not damage electronics.

5. Fire Extinguisher Colour Coding

Colour coding helps identify the type of extinguisher quickly.

Colour Band	Type of Extinguisher
Red	Water
Cream	Foam
Black	CO ₂
Blue	Dry Chemical
Yellow	Wet Chemical

Always read the label before use because the cylinder body is generally red.

6. Choosing the Correct Fire Extinguisher

Choosing the correct extinguisher is very important.

Using the wrong extinguisher can increase the fire or cause serious injury.

Fire Class	Recommended Extinguisher
Class A	Water, Foam, ABC
Class B	Foam, CO ₂ , ABC
Class C	ABC Powder
Electrical	CO ₂ , ABC
Class K/F	Wet Chemical
Class D	Special Class D Powder

Remember:

Correct Fire + Correct Extinguisher = Safe Firefighting

7. PASS Technique

The PASS technique is an easy way to remember how to operate a fire extinguisher.

P – Pull

Pull out the safety pin.

A – Aim

Aim the nozzle at the base of the fire. Never aim at the flames.

S – Squeeze

Press the operating lever slowly.

S – Sweep

Move the nozzle from side to side until the fire is completely extinguished. Continue watching the area to ensure the fire does not restart.

8. Safety Precautions

Before using a fire extinguisher, always remember:

- Raise the alarm first.
- Ensure someone has called the Fire Department.
- Keep an exit behind you.
- Never fight a large fire alone.
- Never turn your back on the fire.
- Use the correct extinguisher.
- Stop immediately if the fire grows larger.
- Evacuate if smoke becomes heavy.

Your personal safety is always more important than saving property.

Key Takeaways

- ✓ Fire extinguishers control small fires during the early stage.
- ✓ Different fires require different extinguishers.
- ✓ Always identify the fire class before selecting an extinguisher.
- ✓ Learn and remember the PASS technique.
- ✓ Never fight a fire that is beyond your control.
- ✓ Your safety comes first.

Practical Activity

The trainer should demonstrate:

- Identification of each type of extinguisher.
- Parts of the extinguisher.
- Reading the pressure gauge.
- Checking the safety pin and tamper seal.
- Correct PASS technique.
- Safe operating distance.
- Proper storage after use.

Each student should practice operating a training extinguisher under supervision.

Module 6

FIRE EXTINGUISHER INSPECTION, MAINTENANCE & PRACTICAL OPERATION

Learning Objectives

After completing this module, learners will be able to:

- Understand the importance of regular fire extinguisher inspection.
- Perform a basic visual inspection of a fire extinguisher.
- Differentiate between inspection, maintenance, and servicing.
- Learn proper storage and placement of fire extinguishers.
- Understand when an extinguisher should be replaced or recharged.
- Safely perform a practical fire extinguisher operation.

1. Introduction

A fire extinguisher is only useful if it works properly during an emergency. An extinguisher that is damaged, empty, or not maintained may fail when it is needed most.

Regular inspection and maintenance ensure that fire extinguishers remain in good working condition and are always ready for use.

Every workplace, school, hospital, shopping mall, office, and factory should have a proper inspection schedule.

2. What is Fire Extinguisher Inspection?

Inspection is a **quick visual check** carried out regularly to ensure that the extinguisher is available, accessible, and ready for use.

Inspection does not require dismantling the extinguisher.

It helps identify obvious problems before they become serious.

Purpose of Inspection

- Ensure the extinguisher is in its designated location.
- Check for visible damage.
- Confirm that it is ready for immediate use.
- Identify missing or discharged extinguishers.
- Improve workplace safety.