Fire and Explosion Control Measures

Level 3 Health and Safety in the Workplace

Introduction

As seen in the previous section of the course, fires and explosions are incredibly dangerous and are something that must be controlled through a risk assessment.

All workplaces must put control measures in place to help reduce the risks. This includes ensuring exit routes and fire-fighting equipment are working and up to date, that people can be easily evacuated, and that you have an effective emergency plan in place.

This section - part two of fire and explosions - covers these control measures in more detail.

Topics to be Covered

The topics covered in this section are:

- Fire detection and warning systems
- Fire escape routes
- Evacuation procedures
- Emergency lighting
- Fire extinguishers
- Fire safety signs
- Preparing an emergency plan
- Precaution against explosions

Fire Detection and Warning Systems

All premises must have a fire detection and warning system. Fire detection and warning systems are very important and all employees should be familiar with the procedures for operating them.

The alarm may be raised automatically via a fire detector system, manually by operation of a manual call point, or by other means.

It is also important to remember that warning systems should be regularly maintained. Aim to test your smoke detectors every month too.

Fire Escape Routes

Fire escape routes should take people from the premises to a place of safety outside and well away from the area. This designated place should have the ability to be used safely and effectively at all times.

Escape routes should be planned in consultation with the local fire authority and with reference to your fire risk assessment.

Each escape route should be protected and enclosed by fire and smoke-resistant materials and, if necessary, the route should be lit by suitable emergency lighting.

All entrances and exits should have clear signs and there must be suitable measures to restrict the spread of smoke in the escape route.

Stairwells must have ventilators to remove smoke and no escape route should run close to a hazardous area, such as a chemical store.

Since the year 2000, building regulations have required that all new buildings must:

- Be designed and constructed so that there are appropriate provisions for the early warning of fire and appropriate means of escape in case of fire.
- Have a means of escape from the building to a place of safety outside the building. This designated place should be capable of being safely and effectively used at all times.

Evacuation Procedures

In cases of emergency, everyone must be able to escape from danger safely. Businesses should have evacuation procedures in place to deal with this.

Personnel who do not have specific, designated duties should leave the building when the fire alarm sounds unless instructions have been given to the contrary, for example as may be the case if phased evacuation is employed.

Everyone should leave in a calm, orderly manner by the most direct route and avoid the use of lifts. Their exit should not be delayed by stopping to collect belongings.

Depending on the circumstances of the building, fire wardens may have been nominated to ensure each area is evacuated.

However, an evacuation procedure cannot be considered reliable until it is proved to be workable and has been practised, typically through a fire drill.

Evacuation of Disabled People

For those with a disability, consideration must be given to the following factors:

- The specific disability of the person likely to be at risk.
- Any unfamiliarity with the premises and/or the evacuation procedures.
- The position of the person in the building - does evacuation take longer?
- Any inability to recognise alarms or evacuate the building without assistance.
- The characteristics of the building that may affect evacuation.

The evacuation of a person with a disability can usually be achieved by devising some simple procedures. Specialist equipment may be needed in some cases, for example, it may be appropriate to install flashing lights that are linked to the alarm system.

Emergency Lighting

Under fire safety legislation, emergency routes and exits must be provided, where necessary, with adequate emergency lighting.

Emergency lighting should be placed:

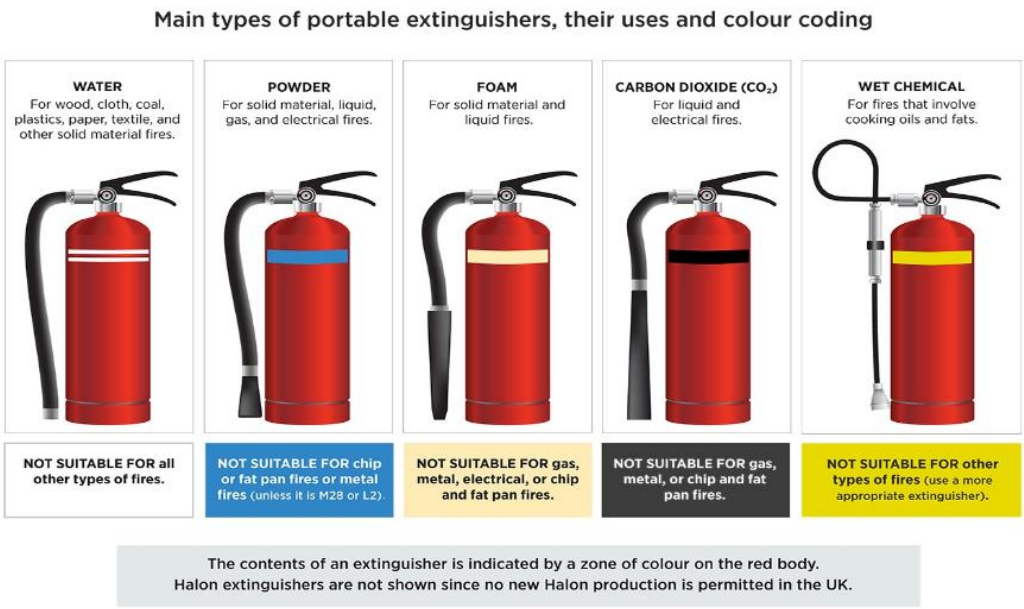
- Near each corridor intersection.
- At each exit door.
- At each change of direction, other than on a staircase.
- Near each staircase, so that each flight of stairs receives direct light.
- Near any change in floor level.
- Outside each final exit door.
- Near fire-fighting equipment, such as extinguishers.
- Near each fire alarm call point.

Fire Extinguishers

There are five main types of fire extinguisher:

1. Water - these can be used to extinguish fires involving flammable combustible materials, such as wood, cloth, plastic, paper, textiles, and other solid materials. They cannot be used on any other type of fire.
2. Dry powder - these are suitable for fires involving flammable liquids or electrical apparatus.
3. Carbon dioxide - these are suitable for fires involving flammable liquids or electrical equipment.
4. Foam - these can be used on most fires involving flammable liquids.
5. Wet chemical - these are only suitable for fires involving cooking oils and fats.

The correct extinguisher must be used on a fire to avoid disastrous consequences. For example, a water extinguisher used on a fire involving flammable liquids can cause a violent reaction.



All workplaces must have a suitable number of fire extinguishers available for use, although this amount will vary depending on the size of the premises.

As a general rule, there should be one fire extinguisher for every 200 square metres and at least one on each floor of the building.

You may also choose to give employees appropriate training so that they can attempt to extinguish small fires without exposing themselves to danger.

Exercise

How many main types of fire extinguisher are there?

- 3
- 4
- 5

Fire Safety Signs

There is a legal requirement under the Health and Safety (Safety Signs and Signals) Regulations 1996 to ensure that:

- Fire safety signs are unambiguous and clear.
- Escape routes and doors are obviously labelled.
- Escape route signs are displayed all along the exit route.
- Fire safety signs are illuminated.
- Direction arrows are included on escape route signs to indicate the quickest route to safety.
- Signs should be positioned at an appropriate height and need to be visible from a distance.
- Signs need to be suitable for use by everyone, including those who have poor vision, dyslexia or do not have English as their first language. It is recommended that fire safety directions are in picture form with supplementary text.
- You should stick to all European Standard signs or all British Standard signs: don't mix the two.

Examples of some common fire safety signs can be seen on the following slides.

Examples of Fire Safety Signs

Sign	Description
	**Fire Extinguisher sign -** displayed next to all fire extinguishers to easily identify the location of the nearest extinguisher.
	**Fire Alarm Call Point sign -** located at all fire alarms.
	**Fire Hose Reel sign -** located at all fire hose points.
	**Fire Blanket sign -** located at all fire blanket locations.
	**In Case of Fire, Do Not Use the Lift sign -** displayed at all lifts alongside the 'Use stairs' sign to indicate safe escape routes.

Sign	Description
	**Fire Door Keep shut sign -** display on each side of all fire doors.
	**Fire Exit sign -** display along all designated fire escape routes (with arrows) and above all emergency exits (without arrows).
	**Fire Assembly Point -** a pictogram or written sign displayed at the outside point of assembly where people must gather after evacuation.
	**In Case of Fire, Use Stairs sign -** an information sign displayed next to lifts and at the top of staircases so people know not to use the lift for safety reasons.

Preparing an Emergency Plan

Every employer, owner, manager or occupier of a premises must prepare an emergency plan in case of fire. Where businesses employ five or more people, this plan must also be recorded.

The emergency plan should include:

- The actions employees should take if they discover a fire.
- How people will be warned if there is a fire (alarm systems etc.)
- The procedures for evacuating the workplace, including measures for disabled people.
- Where people should assemble after leaving the workplace.
- The procedures for checking everyone is present at the assembly point.
- The location and use of any fire-fighting equipment that is provided.
- The duties and identities of employees with specific responsibilities if there is a fire, such as fire wardens.
- How the fire service and any other emergency service will be called and who will be responsible for doing this.

Preparing an Emergency Plan

Part of your emergency procedure also needs to involve instructing and training your workers and visitors. This includes informing them of:

- The action to take on discovering a fire.
- How to raise the alarm.
- The action to take on hearing the alarm.
- The arrangements for calling the fire brigade.
- How to evacuate the premises.
- The location of the evacuation assembly point.
- The location of escape routes and fire-fighting equipment.
- The importance of keeping fire doors closed.
- The importance of good housekeeping.
- The necessity and frequency of fire drills.

Precautions Against Explosions

The control measures best suited to your workplace will be identified by your DSEAR risk assessment and will depend upon the substances present, the likelihood of fire or explosion, and who is at risk. However, alongside these control measures, general fire safety advice should also be followed in the workplace.

Extra care should be taken if you work with:

- Petroleum.
- Acetylene.
- Celluloid.
- Flammable dusts.
- Flammable gases.
- Flammable liquids.

Precautions Against Explosions

Flammable liquids, including both the liquid itself and the vapours it gives off, have the potential to cause fires or explosions. This often occurs when the liquid or vapour is released from a controlled environment into an area where a source of ignition is present.

To help reduce the risk of explosions:

- Substitute the liquid for a high flashpoint liquid where possible.
- Ensure adequate ventilation to rapidly disperse vapours.
- Remove all sources of ignition from handling and storage areas.
- Separate flammable liquids away from other parts of the workroom with fire-resistant partitions.
- Handle the liquids away from the main work area and only use the minimum amount needed.
- Dispense liquids safely to reduce the likelihood of spills and release of vapours. Use a drip tray to catch spills.
- Ensure containers are suitable for what they contain, resistant to wear and tear and labelled correctly.

Exercise

Which four of the following need to be included in training for all staff members?

- [ ] How to fight fires
- [x] The action to take on hearing the alarm
- [x] How to evacuate the premises
- [x] The importance of good housekeeping
- [x] How to raise the alarm

Summary

This module has outlined the control measures that your business should have in place in order to manage the risks from fires and explosions.

Fire detection and warning systems, escape routes and safety signs are essential for every workplace, and all employees should be familiar with how to operate and use them.

Fire extinguishers should also be provided for use. There are five main types: dry powder, water, carbon dioxide, foam and wet chemical. Only employees who have received suitable training should be instructed to use fire-fighting equipment.

This module also taught you that employers must prepare an emergency plan for their business, including details on the actions to take on discovering a fire, evacuation procedures, the available fire-fighting equipment and who has responsibilities. There should also be a plan that ensures precautions are taken to prevent the risks to health and safety in the event of an explosion.