Introduction to Fire Safety

The Costs to Businesses and Individuals

Fires in the workplace can have massive effects on both businesses and individuals. A serious fire can often result in a company closing for good and the cost to individual workers can be far greater.

In addition to the loss of life and physical injury, other possible effects could include unemployment or lost income and those affected may also experience psychological effects.

In many cases a few simple measures can prevent a fire from starting or spreading. Being aware of hazards and understanding some basic principles can reduce the risk of fire and make workplaces safer for everyone.

Cost to Business	Cost to Individuals
Over 22,200 fires	17 fire-related deaths
The average cost to a business is £21,000 per fire	1,083 non-fatal casualties

Sources:
(1) Annual figures (2013/14) from Department for Communities and Local Government (across Great Britain, house fires are not included).
(2) Annual figures (2008) Association of British Insurers

Causes of Workplace Fires

- Arson
- Smoking
- Electrical equipment and wiring *(faulty, poorly maintained or misused)*
- Portable heaters
- Cooking
- Poor housekeeping/accumulated rubbish
- Hot working practices *(such as soldering or welding)*

Fire Hazards

A hazard is anything that may cause harm. The table below shows examples of fire hazards and some of their possible effects:

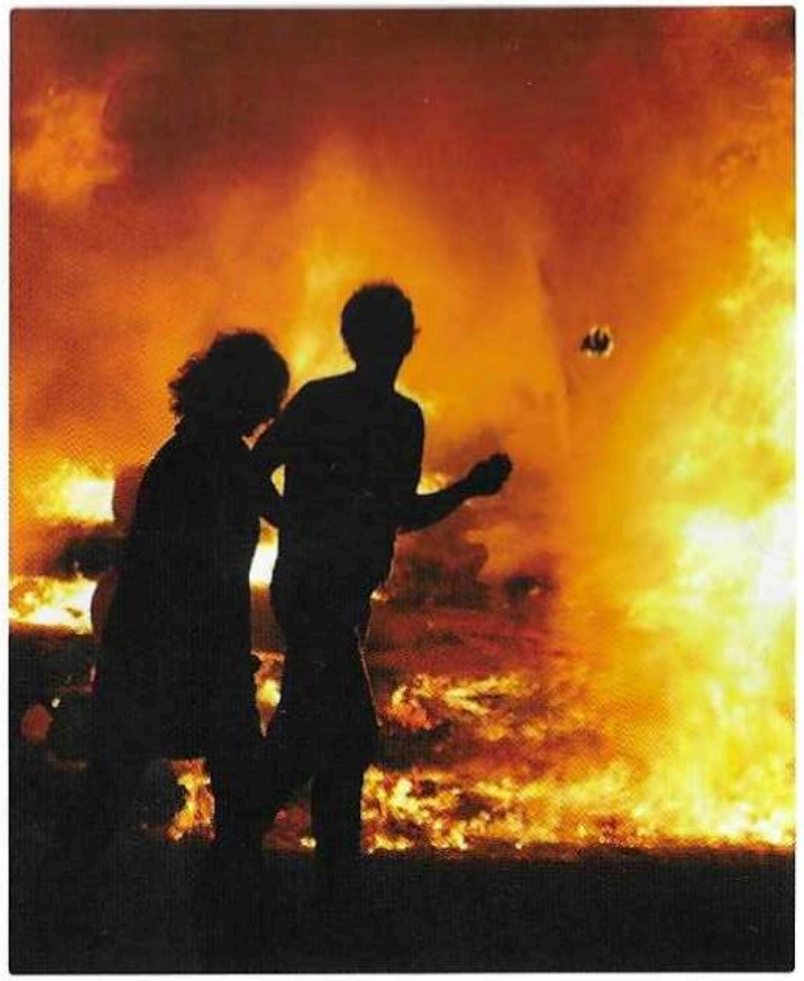
Hazards	Potential to Cause Harm
Flames and heat	Breathing superheated air can be an instant killer due to the damage caused to the airway and lungs. Burns covering over 20 % of the body are usually regarded as life threatening. Burns to the eyes can result in blindness.
Smoke and products of combustion	Inhalation of smoke and fumes are the most common cause of death in fires. A build-up of carbon monoxide can put people into a deeper 'sleep'. Fumes from plastics and man-made fibres can kill – for this reason fire retardant materials are now a requirement in new furniture.
Lack of oxygen	Fire uses up oxygen from the atmosphere. If the brain is starved of oxygen this can quickly lead to unconsciousness and death.
Impact and crushing	Fire damage may cause a building to become weaker to the point where it starts to collapse. Crush injuries, fractures and head injuries are all possible.
No escape route	Doors being locked or routes being blocked can prevent safe escape in a fire situation. The presence of fire itself may block an escape route.

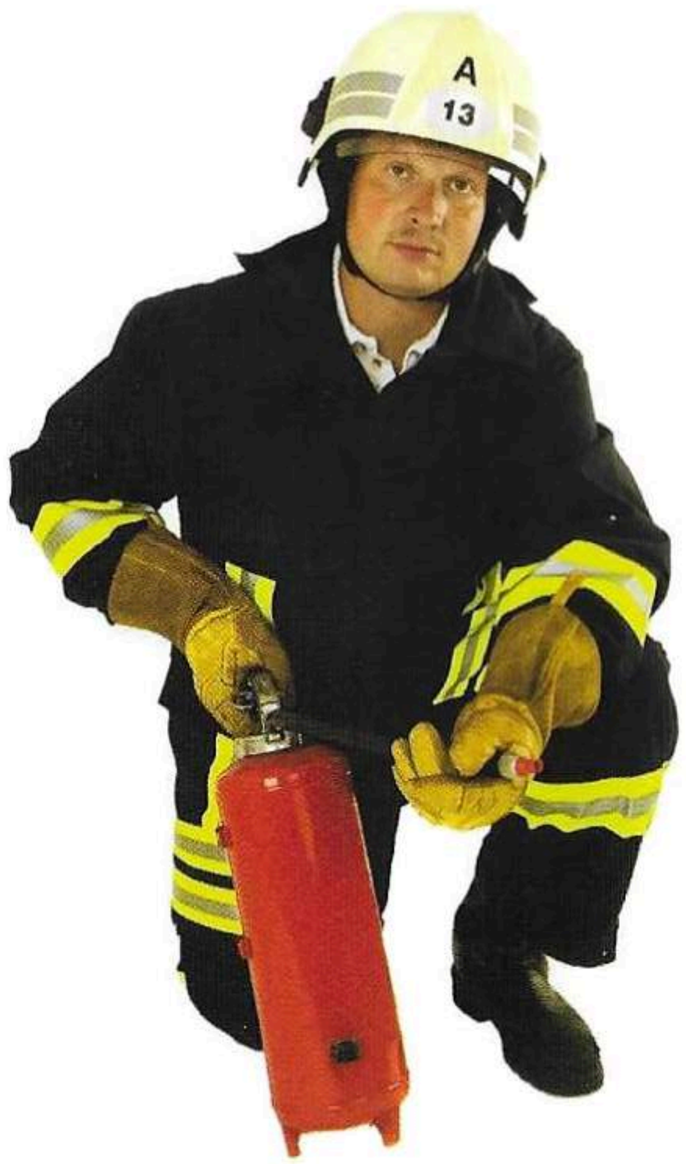
Human Behaviour in Fires

When major fires are investigated, it is often found that human behaviour has played a part in injury or loss of life. As a result, studies have been undertaken to try and understand how people react in a fire emergency. As you can imagine, this is a complex subject but there are a number of common behaviours that are worth highlighting.

Without regular training and fire drills, individuals in a fire situation are likely to:

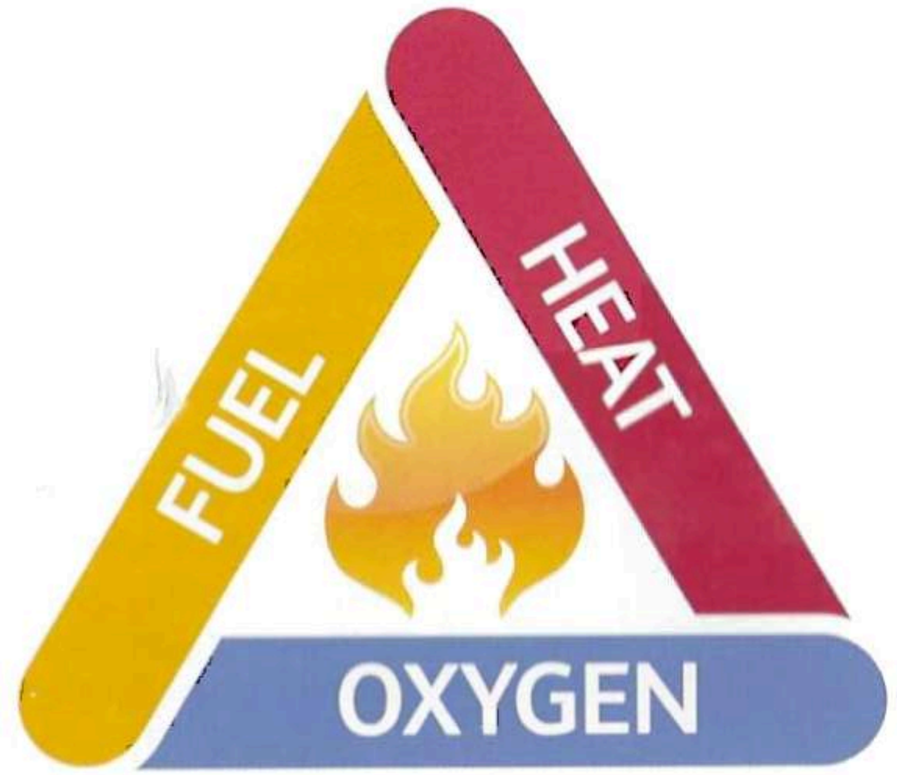
- Underestimate how quickly fire and smoke can spread
- Underestimate the time it takes to get out of the building
- Use a familiar route to evacuate, even if this is not the nearest or safest option
- React slowly *(or not at all)* to the fire alarm
- Look to others for a lead, as they do not want to be first to react





The Fire Triangle

Fire needs three things to develop – take away one of these and the fire will die out.

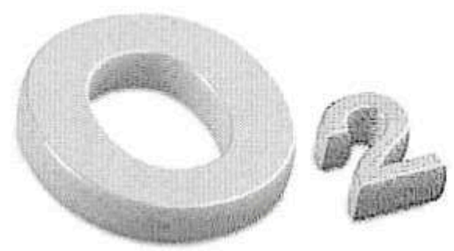


Heat

A fire cannot begin without an ignition source – take away the heat and there will be nothing to start the fire. Sources of ignition include:

- Naked flames
- Gas fires
- Electrical equipment
- Heaters
- Smoking
- Sparks

Oxygen



Fire needs oxygen to burn. This is generally in the atmosphere around us, but can be supplemented by bottled oxygen, depending on the type of business. This is why the fire warden closes doors and windows when doing a sweep of their area, to cut off the supply of oxygen and starve the fire.

Fuel

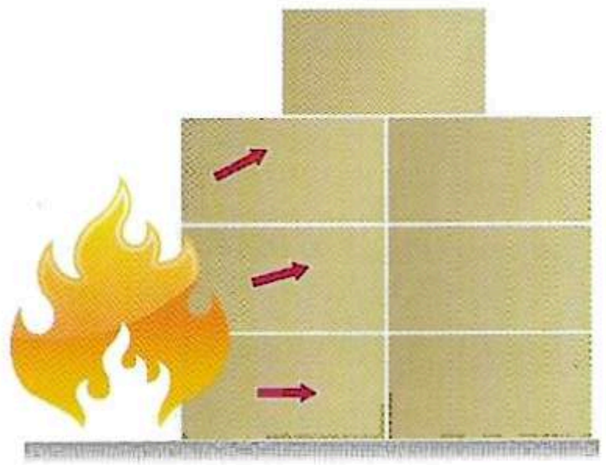
As most things can burn, virtually anything can be a fuel. Commonly found sources of combustible fuels include:

- Textiles
- Cardboard
- Rubbish
- Paper
- Wood
- Gases
- Plastics

Fire Spread and Behaviour

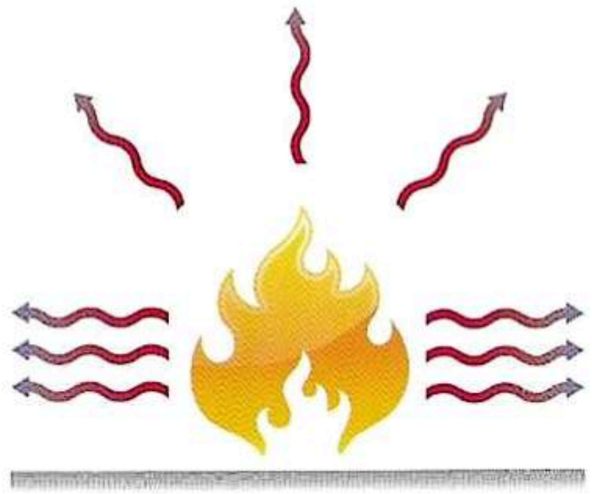
Direct Contact

This is the way fire normally spreads until the heat builds up enough to be spread by other methods. Fire will travel along or through any combustible or flammable material that it comes into contact with. An example of this is placing the flame of a match in contact with paper.



Radiation

Heat can be transferred through electromagnetic waves *(this is why you feel hot when you stand in the sun)*. An example of a fire spreading by radiated heat is a bonfire that has been built too close to a garden fence – the fence will catch fire if enough of the radiated heat reaches it.



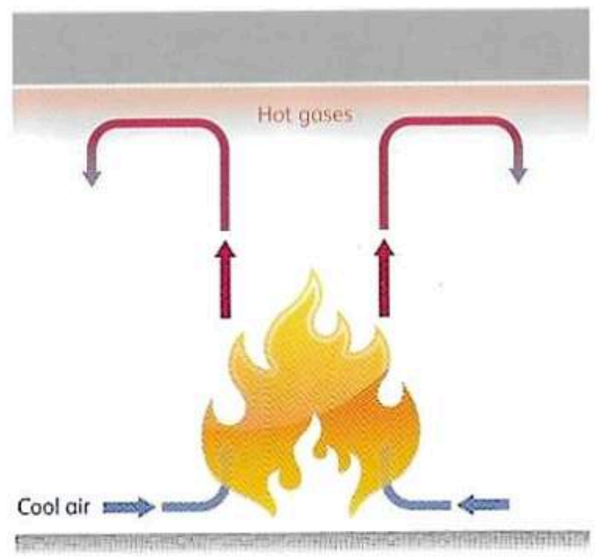
Conduction

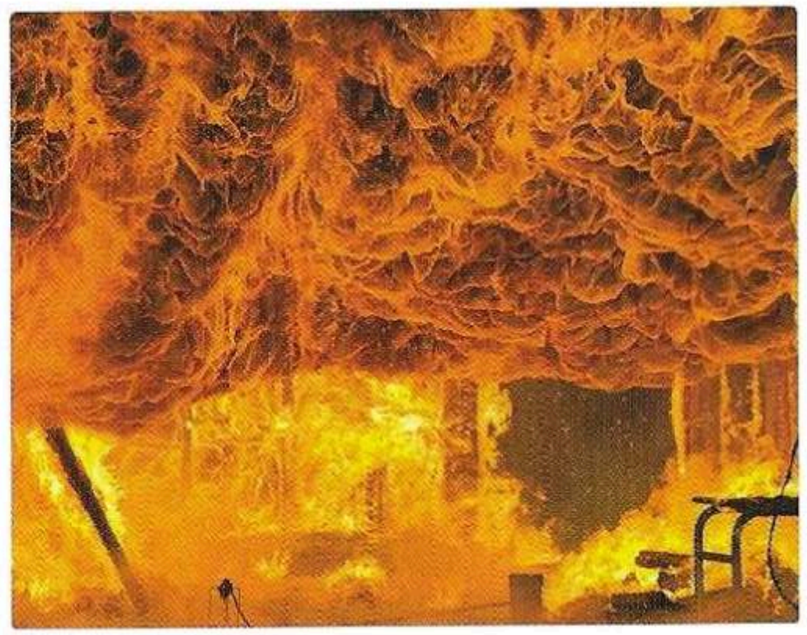
Materials that can readily absorb heat and transfer it along their structure are called thermal conductors *(metals in particular are good conductors)*. An everyday example of thermal conduction is when the metal handle of a pan becomes hot even though it is not in direct contact with the heat that is being applied to the base of the pan. Fires can spread from one room to the next when conducted heat is transferred through walls or steelwork. In such cases a fire will spread if there is fuel on the other side and the temperature gets high enough to ignite it.

Convection

As air gets warm it rises above any cooler air. The movement of hot air and smoke generated by a fire can lead to a build-up of heat at a higher point. This build-up will happen where the air is trapped from moving any higher in places such as a room ceiling, a roof void or above a stairwell. This location could be some distance away from the original source and if there is enough heat, fuel and oxygen, a fire will be created.

Smoke and heat build up in higher areas first, so keep as low as possible if you have to escape a smoke filled room.





Flashover

This is a temperature driven event that changes 'a fire in a room' into 'a room on fire'. If a fire is well ventilated and has a source of fuel, hot smoke and gases will build up in the higher areas of the room through convection. Once established, this hot gas layer will radiate heat downwards onto all the exposed surfaces. As the temperature rises *(to around 500°C)*, all of the combustible materials in the room start to give off flammable fire gases. The near simultaneous ignition of all fuels and gases in the room can then occur.

Backdraught

When an established fire has both heat and fuel, but has little or no ventilation, the lack of oxygen will cause the flames to 'die'. The smoke in the room will contain partially burnt particles *(soot)* and flammable fire gases may also be present. If a window breaks or a door is opened, air will rush into the room and any source of ignition *(such as embers being disturbed by the air flow)* could fully re-ignite the fire, gases and soot. This event can happen with explosive force, sending fire and hot gases out of the door or window that has been opened.

The risk of backdraught is one of the reasons why no one should be allowed back into a burning building. Doors should never be opened where warning signs *(such as escaping smoke or a hot door handle)* indicate that there could be a fire on the other side.

Fire Control Methods

Control measures are precautions taken to reduce hazards and risks. Fire safety control measures can generally be separated into two groups:

1 Fire Prevention *(stopping fires occurring)*

In most cases fire prevention involves simple measures that can be undertaken using the knowledge of how fires develop. Fire prevention at its most basic is based on the principle of keeping fuel sources and ignition sources separate – keep things that burn away from things that create heat.

2 Fire Protection *(saving lives and minimising damage when a fire occurs)*

Some fire protection measures are designed into a property at the building stage. Others can be introduced later, often as a result of a fire risk assessment. Fire protection measures can be classed as either active or passive controls:

Active Control Measures

When a fire is detected, any measure that requires an action by somebody or something *(it can be an automatic system)* is classed as an active control. Examples include:

- Fire alarm systems
- Smoke detectors
- Emergency lighting
- Sprinkler systems
- Fire extinguishers, blankets and hoses

Passive Control Measures

These are usually physical features that have been designed to make a building safer in the event of a fire. Examples include:

- Compartmentation *(fire resistant walls, ceilings, doors, etc. to restrict the spread of fire)*
- Fire exits, escape routes and refuges
- Signage

Stopping Fires Occurring

Housekeeping

Don't block fire exits with boxes or rubbish.

Housekeeping refers to the general tidiness of the building. Good housekeeping is an essential part of fire safety and will minimise the risk of:

- Causing a fire
- Helping a fire spread
- Hindering a safe evacuation
- Obstructing access to firefighting equipment, alarm call points, or fire exits
- Making signs and notices difficult to see

A few very simple steps can help to keep everyone safe:

1 Keep Fire Exits and Escape Routes Clear

Never use escape routes for storage. It can increase the likelihood of fire in this area and will reduce the width of a corridor for people to exit. Stored items can get knocked over in an evacuation, especially if it is smoky.

2 General Tidiness of the Workplace

Take care where potential sources of fuel are stored. Avoid the build-up of combustible materials by cleaning regularly. This will greatly reduce the risk of fire.

3 Managing Rubbish and Waste

Do not allow rubbish or waste products to build up inside or near your building. Make sure that rubbish bins and waste is secure and collected regularly.

Electrical Equipment and Wiring

A high percentage of faults with electrical equipment can be found by just looking at it. Everyone can play a role in improving safety by making quick visual checks of the equipment they use.

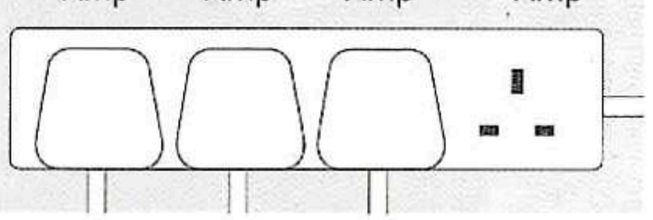
Things to look for:

- Damage to cables, e.g. cuts and abrasions to the cable covering
- Damage to plugs, e.g. cracked casing or broken pins
- Loose cables, e.g. the outer covering of the cable not being gripped properly by the plug
- Signs of overheating, e.g. burn marks, staining or melted plastic
- Bare wires *(none should be visible)*
- Coiled extension cables *(make sure coiled extension cables are fully extended when in use)*

If you notice any of the faults listed, a qualified person should undertake any necessary repairs.

If you need to run more than one plug from a socket, use gang leads as the older cube adaptors can arc, spark and overheat.

4 spaces doesn't always mean 4 plugs!

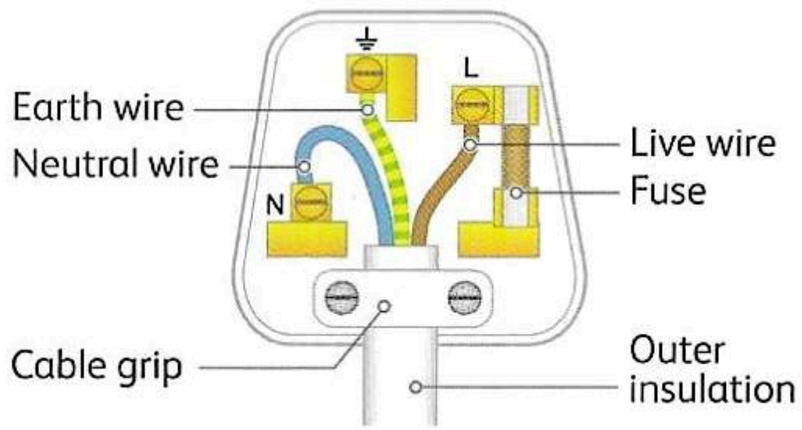


NEVER

- ✘ Overload electrical sockets
- ✘ Overload extension leads *(don't plug in a combination of appliances that will exceed the maximum current rating for the lead)*

ALWAYS

- ✔ Unplug non-essential equipment when it is not in use
- ✔ Make sure that all plugs are correctly fitted with the correct rating of fuse



Appliance Wattage	Fuse Size	Appliance Examples
less than 700W	3 Amp	Table lamp or soldering iron
Over 700W	13 Amp	Kettle or dishwasher

Portable Heaters

Wherever possible the use of portable heaters should be avoided. Where there is no alternative, try to use oil filled heaters rather than convection heaters and apply the following rules:

- Don't put anything on top of a heater
- Don't put it where it can be knocked over
- Make sure there are no sources of fuel anywhere near the heater

Smoking

Even though the UK smoking ban has reduced the risk of fires starting, smoking still accounts for a significant number of workplace fires. All staff should be made aware of the smoking laws and informed if there is a designated smoking shelter as part of their induction training. Providing a designated smoking shelter can reduce the likelihood that people will be tempted to ignore the law and smoke within the building, especially in bad weather.

Arson

Arson is the biggest cause of business fires. We cannot stop human actions, but there are steps we can take to reduce the risk of arson. Good housekeeping, fire risk assessments, staff training, installing CCTV and external lighting and making sure a building has adequate security will all play a part in making your premises safer. Measures to reduce the risk of arson can be broken down into two groups:

1. **Security measures** – *stop them gaining access*
2. **Storage and housekeeping measures** – *deny them fuel*

Because of theft, security is normally a high priority in most buildings. The good news is that the same security measures also help to prevent arson. It is often the areas that do not hold anything of value *(like waste storage areas, disused out-buildings, empty store rooms or the grounds around buildings)* that need additional security measures to prevent arson.

Letter boxes, air vents and gaps under doors can all be ways for an arsonist to introduce fire into a building. Securing a mesh over a vent, reducing the size of a gap, or having a metal box inside the letter box can reduce the likelihood of fire.

Storing combustible materials near to doors, windows or close to perimeter fences should be avoided if possible. If a skip is required there is a temptation to place it close to a door or exit. Skips and outdoor waste bins often contain lots of combustible materials, so ideally they should be placed at least 5 metres away from the building and bins should be secured with a padlock and chain.

Saving Lives and Minimising Damage

Fire Safety Signs

There are five types of safety signs in the workplace:

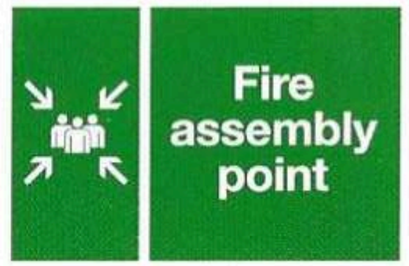
Prohibition
(not allowed)

Red border and crossbar from top left to bottom right, on a white background.

Mandatory
(must do)

Circular in shape, with a white symbol on a blue background.

Safe Condition



Square or rectangular in shape, with a white symbol on a green background.

Information

Square or rectangular in shape, with a white symbol on a red background.

Warning

Yellow triangle with a black border.

Means of Escape

Building features that are designed to allow people to get away from danger to a place of relative safety are given the name 'means of escape'. Buildings are often divided into compartments that are separated by fire resistant walls, ceilings and doors.

The purpose of compartmentation is to restrict the spread of fire and smoke from one area to another. As a result, people should only have to travel a short distance *(into the next compartment or protected route)* to reach a place of relative safety away from the fire and smoke.

Anyone with responsibility for undertaking fire risk assessments or fire safety inspections needs to understand how these fire control methods work in their building.

Internal Fire Doors

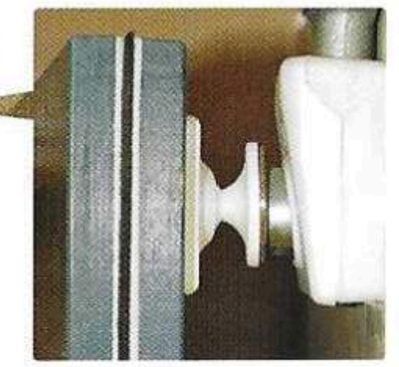
Internal fire doors with self-closing devices play a vital part in compartmentation, so it is important **not** to wedge them open *(especially with fire extinguishers)*. Some fire doors are designed to be held open by magnets. To make sure they will close automatically in the event of a fire, they need to be kept free from any obstructions and tested regularly. All internal fire doors should also be labelled. These signs are white squares with a blue inner circle stating that it is a fire door and should be kept shut. A good fire door could hold a fire back for thirty minutes, enabling everyone to get to safety.

REMEMBER
A wedged fire door is no longer a fire door.

Escape Routes

Wherever you stand in a building, you should be able to see at least one green sign showing either the fire exit or the exit route.

These signs should be positioned above doors and where there is a change of direction or floor level. Newer signs *(that comply with EU directives)* have no writing, just pictures and arrows. Once everyone is out of the building it is important that the assembly point is clearly signed *(this is also a green sign)*.



A wall-mounted magnetic fire door holder will release the door when the fire alarm activates.

Fire Exits

All escape routes should eventually lead to a fire exit that should open outwards. This can be an exit that is used only in an emergency or a normal entrance to the building that is used regularly. Fire exits can be locked at night for added security, but they must be unlocked as soon as anyone is in the building.

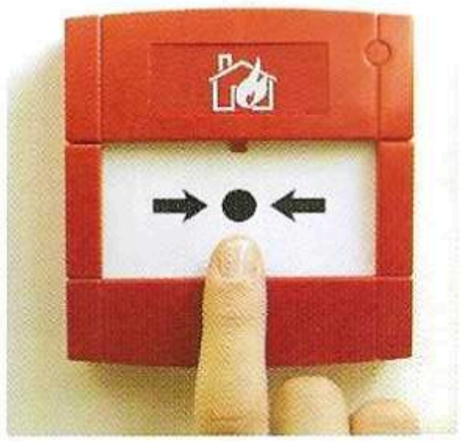
Fire exits must be signed from inside the building and should be checked regularly to make sure they fully open and close properly. Any obstruction on the outside of a fire door could prevent it from opening in an emergency. 'Fire exit. Keep clear' signs should be used and the floor marked with a yellow-hatched box where the door opens to reduce the likelihood of this happening.

Emergency Lighting

Should a loss of power cause the normal lighting to fail, an emergency lighting unit will automatically light up the area using power from batteries. This light may not be as bright as the normal lighting, but it should allow people to evacuate safely by illuminating important areas such as escape routes, fire exits, exit signs and other safety equipment.

Signing In and Out

When a building is evacuated, the person in charge will need to determine if everybody is accounted for. This is usually achieved by requiring all staff and visitors to use a signing in/out book when they enter or leave the building. In the event of fire this book can be grabbed quickly and used at the assembly point.



Many premises use manual call points to raise the alarm.

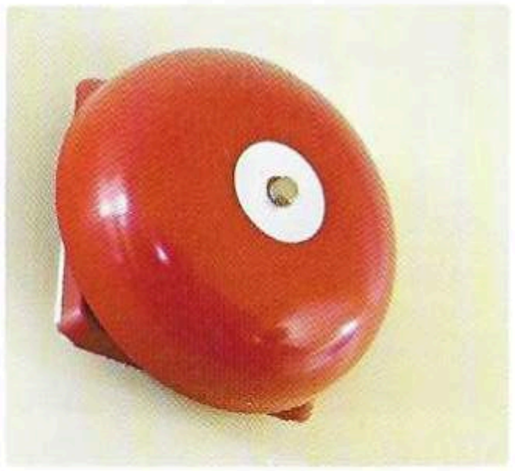
Alarms Systems and Detectors

The type of alarm used must be adequate for the size and nature of the business. If only a few employees work in one or two rooms, word of mouth may be adequate, e.g. shouting, "Fire, fire, fire!" or using an air horn. If a fire is discovered everyone in the building needs to be alerted. Almost anything that is audible to everyone can be used as an alarm, as long as all employees know what it sounds like.

Larger workplaces will obviously require more advanced detection and alarm systems. The type of system required is often determined by the fire safety risk assessment. People with responsibility for fire safety in their place of work should familiarise themselves with the alarm system and how it works.

Acceptable Types of Alarms May Include:

Bells



Air Horns

Sirens/Buzzers

Where people work in a noisy environment or have hearing difficulties, another type of alarm signal *(such as strobe lighting or vibrating pagers)* should be considered.

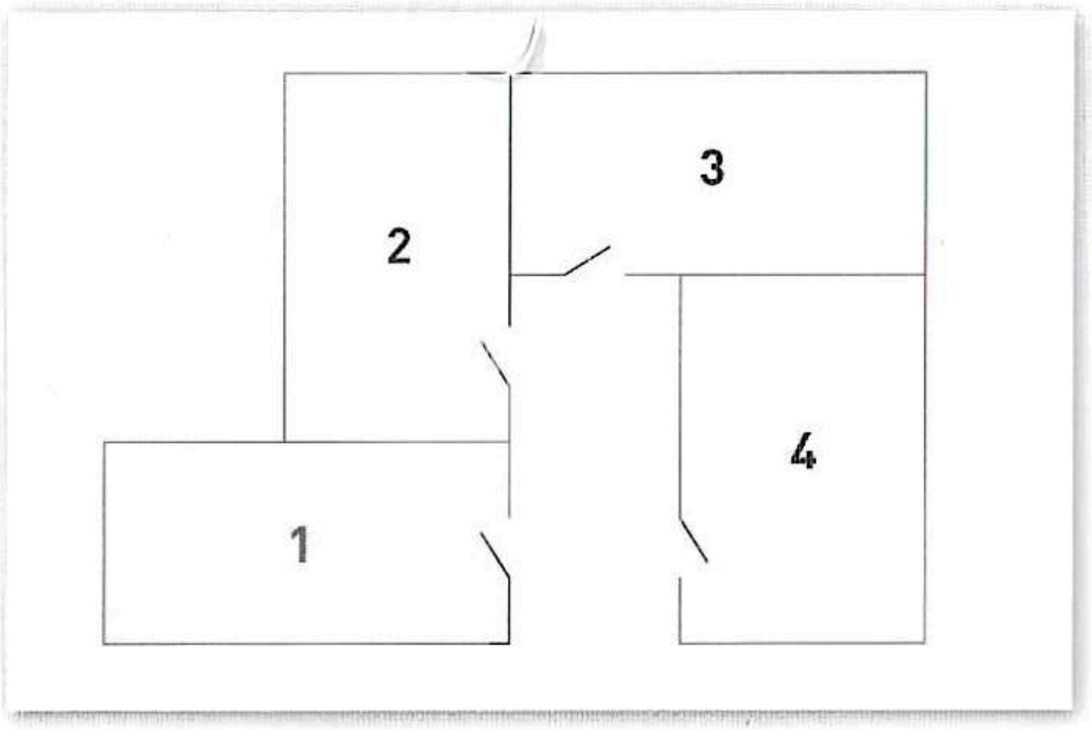
All fire alarms should be checked regularly with the results recorded and any defects reported and fixed as soon as possible. A regular fire alarm check also allows employees to be familiar with the sound of the alarm.

Several different types of detectors are available to automatically alert people to the presence of fire. These can be activated by the signs of fire *(smoke, gases, heat or radiation)*. Most modern fire alarm systems use more than one method of detection.

Next to the fire alarm panel there should be an up-to-date plan for every floor of the building, including basements and roof spaces to help the firefighters go straight to the area that has activated the alarm.

Problems arise if the plan is missing, or if the layout of the building has changed, e.g. walls added or taken away. This should be updated as part of the fire safety risk assessment.

Example of a Floor Plan of a Building:



Fixed Firefighting Equipment

Hose Reels

Hose reels are connected permanently to the water supply. This gives an advantage over portable fire extinguishers by making a large amount of water available very quickly.

Thought must be given to hose reel location as they can wedge open fire doors, can cause a trip hazard and they have a limited range *(typically 30m with a jet of 6m)*.

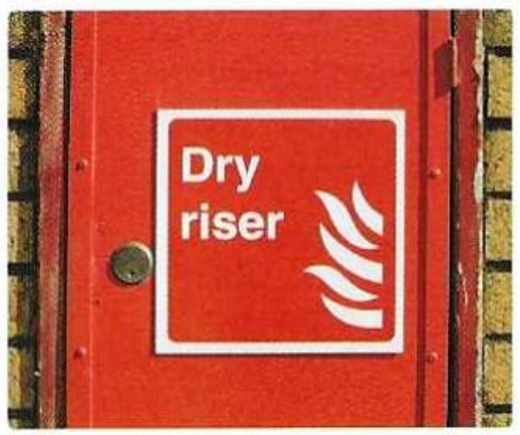
The use of hose reels can be dangerous as due to the constant water supply people not experienced at fighting fires may put themselves at risk by attempting to fight a fire for too long. **Hoses should not be used where there is live electricity.**

Sprinkler and Drenchers

These systems deliver water through a network of pipes and sprinkler heads. When activated, the water from the sprinkler head will restrict or extinguish fire and help prevent the build up of heat. Drenchers are similar to sprinklers systems but are located outside in order to prevent fire spreading from one building to the next.

Gas Flooding Systems

As these systems present a risk of suffocation, they are only used in enclosed spaces that are normally unoccupied *(such as electrical equipment rooms)*. An alarm will usually warn that the system is about to be activated and then after a delay, the room will be 'flooded' with gas *(usually carbon dioxide)* to replace the air and smother the fire.



Wet and Dry Risers

Risers are vertical water pipes and valves that are fitted in high-rise buildings for use by the fire service. Wet risers have pipes that are permanently charged with water, whilst dry risers have empty pipes that will fill with pressurised water when needed.

Foam Systems

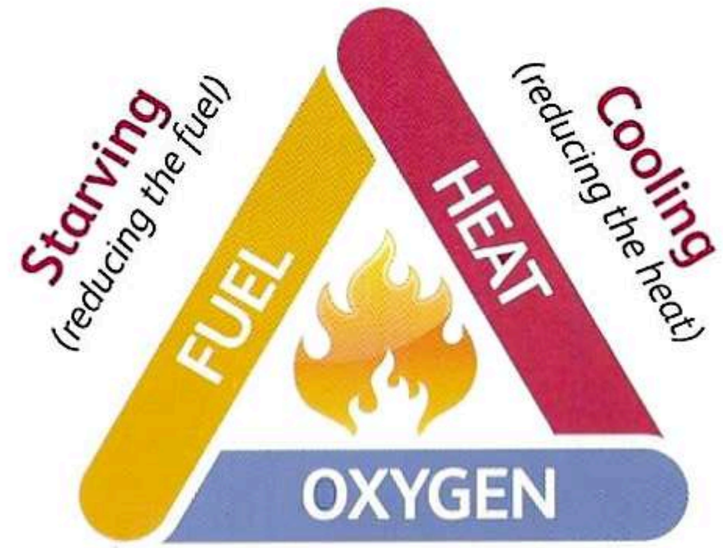
Facilities that store flammable liquids *(such as fuel storage tanks, chemical plants, etc.)* may use a fixed foam system. The foam not only smothers the fire but also reduces the chance of re-ignition by controlling vapour build-up.

Fire Extinguishers

Extinguishing Fires

To extinguish a fire, one or more of the elements in the fire triangle has to be removed or reduced to a level where it will no longer support combustion.

Most extinguishers work by smothering or cooling the fire *(or a combination of both methods)*. Employers and those responsible for premises must provide appropriate firefighting equipment for the risk and make sure sufficient people are trained in its use.



Smothering
(reducing the oxygen)

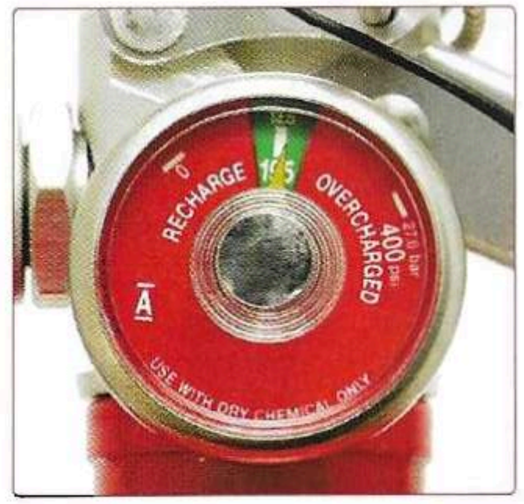
Fire Extinguisher Checks

A trained fire extinguisher engineer should inspect and service all extinguishers annually.

Extinguishers should be suitable for the risks assessed and highlighted in the Fire Safety Risk Assessment.

It is also important that extinguishers are checked regularly throughout the year to make sure:

- The pressure gauge needle is in the correct position *(in the green zone)*
- There are no signs of tampering and the safety pin is in place
- It has been serviced within the last 12 months *(a test label should be visible)*
- There are no signs of rust, corrosion or leaks
- It is sited correctly in an easily accessible position, ready to be picked up and with a sign indicating its type placed next to it



Fire extinguisher pressure gauge showing the correct pressure.

Fire extinguisher point sign.

Commonly Used Fire Extinguishers

Fire extinguishers are red with a coloured label to indicate its type. A sign giving details of its type and use must be placed by the extinguisher.

REMEMBER
Do not attempt to fight a fire unless you have been trained to do so.

Water Extinguishers — RED LABEL

Only suitable for use on solid materials such as wood, paper, straw, textiles, coal etc. Some water extinguishers contain additives to make them more effective.

How it works:
Water is very effective at cooling the fuel surface.

Warnings:
Do not use on electrical equipment.
Do not use on cooking oil or fat pan fires.
Do not use on flammable metal fires.

Foam Extinguishers — CREAM LABEL

Can be used on flammable liquids and the same type of fires that water extinguishers can be used on. Particularly suitable for petrol and diesel fires.

How it works:
A water based foaming agent floats on top of the burning liquid and smothers the flames at the surface. There is also a limited cooling effect.

Warnings:
Do not use on cooking oil, fat pan fires or flammable metal fires.
Do not use on electrical equipment *(unless stated otherwise)*.

CO_2 *(carbon dioxide)* Extinguishers — BLACK LABEL

Suitable for fires involving electrical equipment *(even when live)*. Can also be used on flammable liquids, e.g. paint, petrol etc.

How it works:
Carbon dioxide replaces the air and smothers the fire.

Warnings:
Do not use on cooking oil, fat pan fires or flammable metal fires.
Should not be used in confined spaces.
The fire may re-ignite as it does not cool very well.
The discharge horn and hose may freeze and could cause cold burns if in direct contact with the skin.

Dry Powder Extinguishers — BLUE LABEL

Can be used on most types of fire, including fires on electrical equipment *(but it could damage the equipment)*.

How it works:
The powder coats the fuel and smothers the fire. Some powders are also designed to stop a chemical reaction that is needed by the fire.

Warnings:
Do not use on cooking oil, fat pan fires or flammable metal fires.
Powder types can vary, this will affect the types of fire they should be used on.
Not suitable for confined places *(can affect visibility and people with breathing problems)*.

Wet Chemical Extinguishers — YELLOW LABEL

The only extinguisher that can be used on cooking oils and fats *(e.g. lard, butter, olive oil, sunflower oil, etc.)*

How it works:
A fine mist is delivered that has a cooling effect on the flames. Salts in the solution will react with the animal fats and vegetable oils to form a layer at the surface that smothers the fire.

Warnings:
Should not be used on petrol, spirits or mineral oils.
Check manufacturer's instructions for other uses.

Fire Blankets

Fire blankets are made of a fire retardant material and are used to smother small fires. They are most commonly found in kitchens. Where it is safe and quick to do so, you should turn off the heat *(e.g. the gas or electric supply to a cooker)* before trying to extinguish the fire. If the fire is bigger than the blanket, you should not attempt to smother it.

Using a fire blanket:

- Pull it out from the case
- Hold it in front of you, gripping it near the top corners
- Protect your hands by making sure the blanket covers them
- Place the blanket over the fire
- Leave the fire covered for 30 minutes to prevent re-ignition *(hot liquids and oils are particularly likely to re-ignite if oxygen becomes available again)*

Some fire blankets are designed for single use, so the manufacturer's instructions should be checked following a fire.

Classes of Fire

How a fire should be extinguished depends on what type of material is burning. Therefore it is important to know the different types of fire so they can be extinguished safely. These are split into six different classes:

		Water	Foam	CO_2 Gas	ABC Dry Powder	Dry Special Powder	Wet Chemical
Class A – flammable solids, e.g. paper, wood and textiles	A	✓	✓		✓		✓
Class B – flammable liquids, e.g. petrol and paint	B		✓	✓	✓		
Class C – flammable gases, e.g. butane and propane	C				✓		
Class D – flammable metals, e.g. magnesium and lithium	D					✓	
Electrical – fires involving electrical equipment.				✓	✓		
Class F – cooking oils, e.g. vegetable oil and fat	F						✓

Using a Fire Extinguisher

You should only ever attempt to fight a fire if it is safe to do so!

You should only fight a fire if:

- Someone has raised the alarm
- The emergency services have been called
- The correct type of extinguisher is available
- You are competent and have been trained to use the extinguisher
- A safe escape route is available
- The fire is smaller than a waste paper bin

Do not fight a fire if:

- The room is filling with smoke or the fire is spreading
- Other hazards are present *(such as chemicals or gas cylinders)*
- The fire is not reducing or more than one extinguisher is required

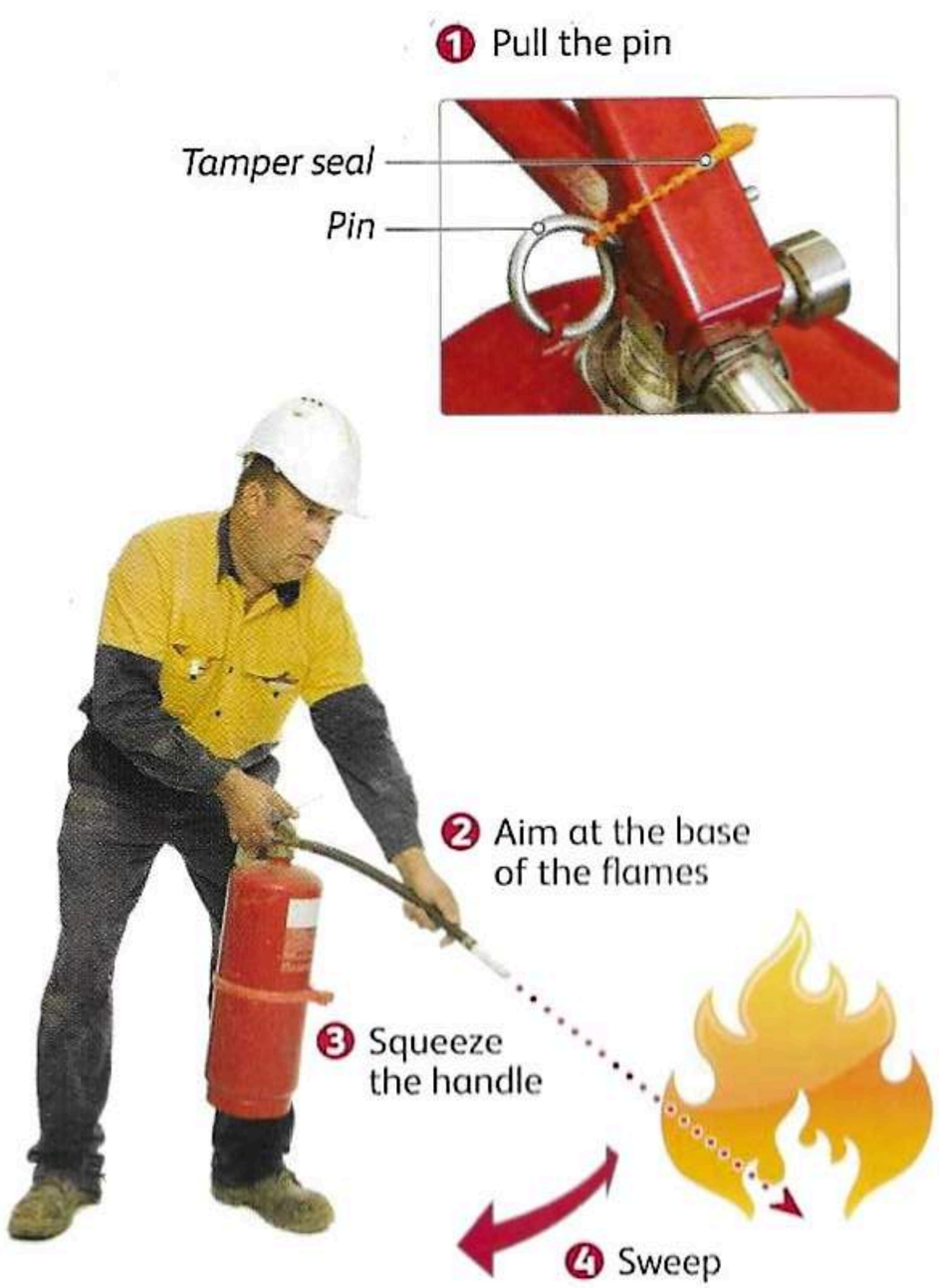
Whilst different extinguishers should have their instructions for use on the cylinder, the general advice for operating a fire extinguisher can be remembered as **PASS**.

P Pull – Pull the pin. This will also break the tamper seal.

A Aim – Aim low, pointing the extinguisher *(nozzle, horn or hose)* at the base of the flames.

S Squeeze – Squeeze the handle until the extinguisher discharges.

S Sweep – Sweep from side to side at the base of the fire until it appears to be out. Watch the area. If the fire reignites, repeat steps 2 to 4.

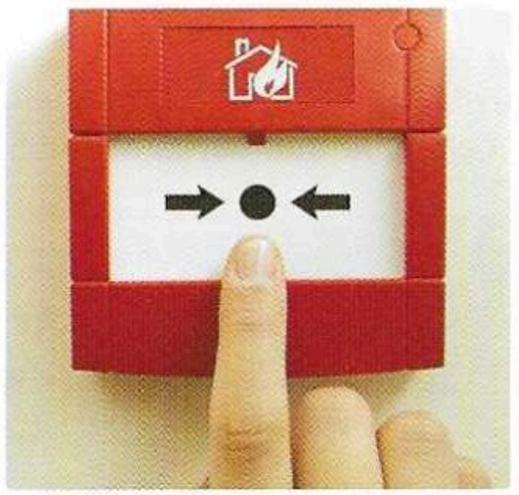


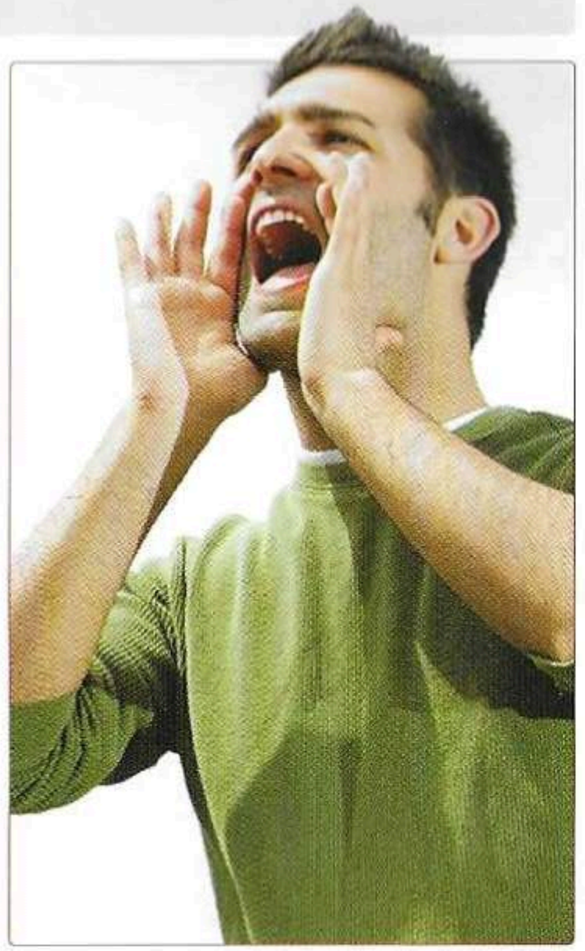
Fire Safety Procedures

Actions on Discovering a Fire

If you discover a fire *(or even suspect there may be one)* you should:

- Raise the alarm
- Make sure the fire service is called
- Evacuate the building following the procedures of your workplace





Actions on Hearing the Alarm

Each workplace should have its own procedures covering what to do in the event of a fire. The table below contains some simple advice on what you should and shouldn't do when the alarm is raised:

ALWAYS	NEVER
✔ Stay calm and act immediately	✘ Delay your evacuation by collecting your belongings, finishing a task or waiting for others to react
✔ Leave the building by the nearest exit	✘ Use lifts *(unless this is part of a personal evacuation plan)*
✔ Close windows and doors behind you (if you are the last to leave)	✘ Tackle a fire unless you are trained and it is safe to do so
✔ Assemble at your designated assembly point, and wait to be accounted for	✘ Re-enter the building until you are told it is safe

Fire Safety Briefing

Employers have a legal duty to make sure their employees are trained in fire safety procedures. All new employees *(permanent or temporary)* should receive a fire safety briefing as part of their induction training and whenever anyone starts work in a new location. They should also receive regular refresher training.

They will need to know:

- The details of the emergency plan
- Where the fire exits are
- Where their assembly point is and how to get to it from different parts of the building
- The fire precautions in the building
- What firefighting equipment is available and its location
- How to report fire safety issues or defects
- The importance of keeping fire doors closed
- What day and time fire alarm tests are held *(if the alarm is heard at any other time, it should be treated as a fire and they should evacuate the building immediately)*

Any visitors or contractors will also need a fire safety briefing the first time they are in your building. It is also important to establish at this briefing if their presence could introduce any additional fire risks that need to be assessed.

Fire Drills

Fire drills play an important part in fire safety as they allow everyone to put into practice their role in the fire action plan. Regular fire drills *(at least once a year)* not only help to refresh the knowledge of what to do in a fire emergency, they will also highlight any areas that require improvement.

Ideally a fire drill should be made as realistic as possible, this can be done by:

- Limiting the number of people who are aware it is a drill
- Changing the time of day that drills are held
- Evacuating with an exit blocked to simulate a fire in the area
- Asking a member of staff to raise the alarm *(as if they had discovered the fire)*

It is good practice to record the time taken from the alarm being raised to the last person leaving the building and how long it takes for everyone to be accounted for. Following a fire drill the causes of any delays should be investigated to try and prevent them happening in future. In larger buildings the time taken to reach a protected area such as a staircase may be recorded.

Fire Safety and the Law

The Fire Safety Order

The Regulatory Reform *(Fire Safety)* Order 2005 replaced more than seventy separate laws on fire legislation in England and Wales *(similar legislation was also introduced in Scotland and Northern Ireland)*. This law is now commonly referred to as the Fire Safety Order *(FSO)*.

The 'Responsible Person'

Before the FSO was introduced, the fire service had the responsibility of inspecting companies to make sure buildings were safe. That responsibility now falls with the building owner, occupier or the employer.

The job can be delegated, but the ultimate responsibility stops with them. The law applies to anyone who is:

- Responsible for a business premises
- An employer *(or self-employed)* with business premises
- Responsible for part of a dwelling that is solely for business use
- A contractor with a degree of control over any premises
- Responsible for a premises used by a charity or voluntary organisation
- Providing accommodation for paying guests
- The owner or agent of a block of flats or houses of multiple occupancy *(in England and Wales)*

'Responsible Person' Duties

The 'responsible person' must carry out a suitable and sufficient Fire Safety Risk Assessment (FSRA) and make sure appropriate fire prevention and protection measures are in place to minimise the risks to relevant person(s) – see below. This will include making sure fire safety equipment is operational and maintained, providing appropriate training, preparing an emergency plan and reviewing the FSRA significant findings regularly to reflect any changes that have occurred.

Individuals or groups that are referred to in the FSO include:

Responsible person	Someone with ultimate responsibility for fire safety
Relevant person(s)	Anyone lawfully on the premises or who may be directly affected by a fire on the premises
Competent person(s)	Someone who has sufficient fire training, experience or knowledge, specific to the complexity of the premises, to enable them to properly assist the responsible person

Employees' Duties

Under the FSO and the Health and Safety at Work etc. Act *(1974)* all employees have a legal duty to:

- Act in way that does not put themselves or others at risk
- Co-operate with their employer on any fire safety matters
- Inform someone who is responsible if they are aware of any dangers in the workplace

Penalties and Enforcement

Breaches of the FSO fall under criminal law. The maximum penalty is an unlimited fine and the Crown Court has the power to imprison those found guilty for up to 2 years.

Enforcement officers *(usually from the local fire authority)* can issue notices to the 'responsible person' if they feel there is an unacceptable level of risk.

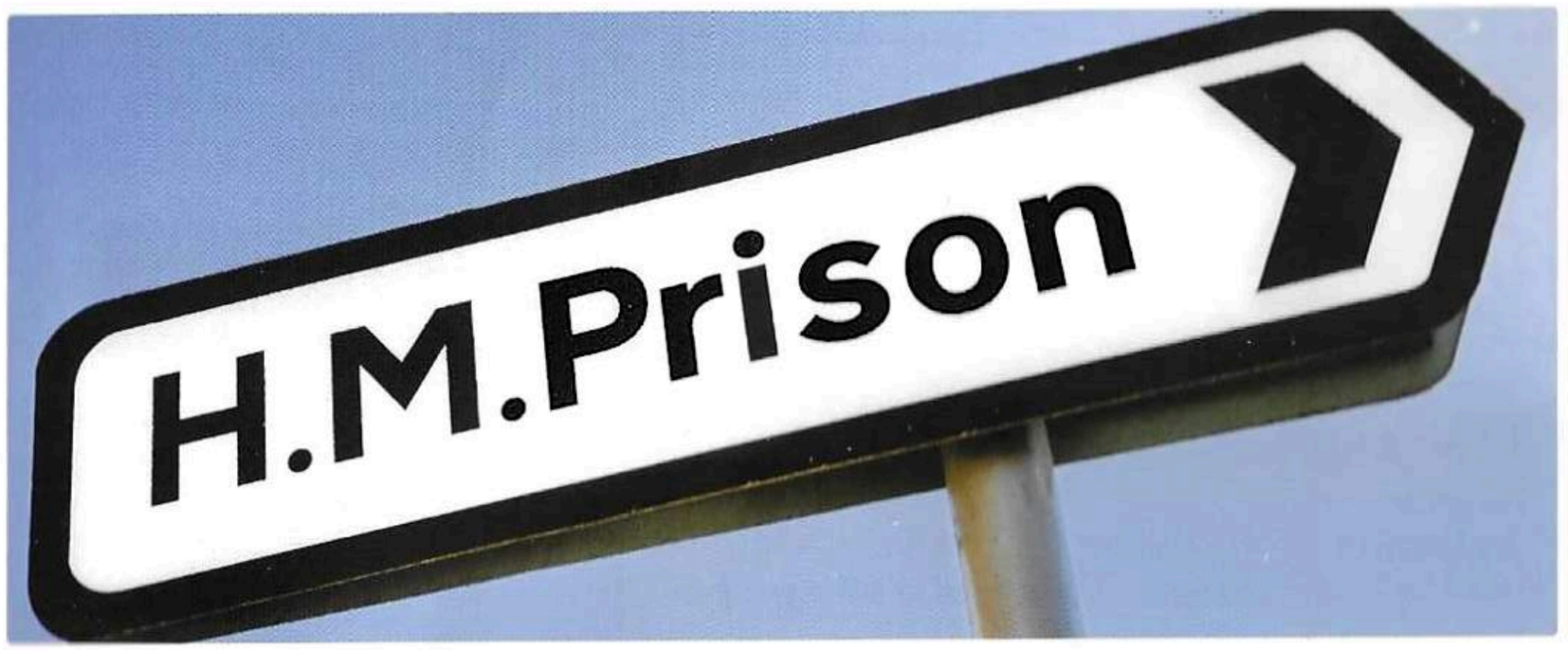
Three types of notice can be issued:

Alterations notices are issued if the premises have high safety risks or if there is an unacceptable level of risk due to a physical change to the structure of a building or a change in its use.

Enforcement notices are issued when requirements within the FSO have not been met.

Prohibition notices are issued where there is an immediate danger to individuals. This type of notice can prevent an activity being carried out or stop part *(or all)* of a workplace being used.

All types of notices can be appealed within 21 days of being served. Alteration and enforcement notices are put on hold until an appeal is heard, but prohibition notices stay in force until either the appeal is successful or the conditions of the notice have been met. Failure to comply with a notice is a criminal offence.



Fire Safety Risk Assessment *(FSRA)*

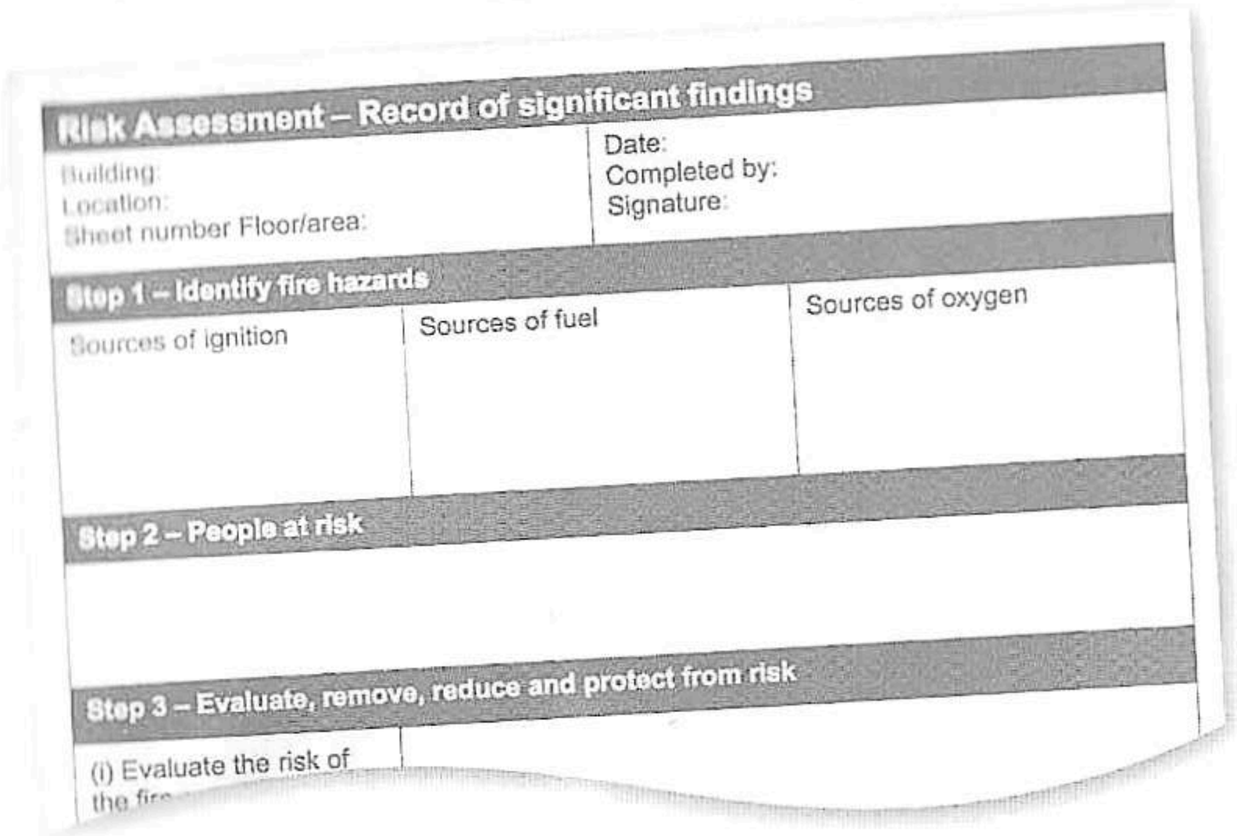
There are five steps to completing a Fire Safety Risk Assessment:

Action	Notes
1 Identify Fire Hazards:	
Sources of ignition.	Consider heaters, lighting, naked flames, electrical equipment etc.
Sources of fuel.	Consider packaging, rubbish, furniture, equipment etc.
Sources of oxygen.	Is bottled oxygen used anywhere?
2 Identify People at Risk:	
People in and around the premises.	Consider employees, the public, visitors, contractors etc.
People who have a higher risk.	Consider night staff, children, disabled, elderly or anyone needing assistance in case of a fire.
3 Evaluate and Act:	
Evaluate the hazards and risks you identified.	Think about your significant findings from Steps 1 and 2.
Remove or reduce fire hazards.	For example, separate things that can burn from things that could start a fire.
Remove, reduce and protect people from the risks of fire.	Protect people by providing sufficient fire detection and alarm systems, suitable firefighting equipment, escape routes and training.
4 Record, Plan and Train:	
Record your significant findings and actions.	**This is a legal requirement if you have 5 or more employees, or your premises are licenced.**
Discuss with other 'responsible persons' in the building.	Share information on risks and co-ordinate measures.
Prepare and implement an emergency plan.	The information in your FSRA should assist you to develop an emergency plan – see page 27
Provide training.	Inform all staff what to do in the event of a fire. Provide suitable training for those with specific fire duties, e.g. fire wardens.
5 Review:	
Review your FSRA regularly.	Make sure it is updated to reflect any significant changes that have occurred or if there has been an incident or 'near miss'.

REMEMBER
A Fire Safety Risk Assessment is ongoing and must be kept up to date.

Detailed guidance about undertaking a FSRA is available from the Department for Communities & Local Government website: **www.communities.gov.uk/fire/firesafety/firesafetylaw/**

Example Form for Recording Significant Findings:



Risk Assessment – Record of significant findings		
Building: Location: Sheet number Floor/area:	Date: Completed by: Signature:	
Step 1 – Identify fire hazards		
Sources of ignition	Sources of fuel	Sources of oxygen
Step 2 – People at risk		
Step 3 – Evaluate, remove, reduce and protect from risk		
(i) Evaluate the risk of the fire		

The Emergency Plan

The 'responsible person' has a legal duty to provide an emergency plan specific to the premises. This must be recorded if you employ 5 or more people *(including part time workers)*, or your premises are licenced.

Where appropriate the emergency plan should include details of the following:

- Actions on discovering a fire
- Warning if there is a fire
- Calling the fire service
- Evacuation of the premises including those particularly at risk
- Places of assembly and roll call
- Liaison with emergency services
- Identification of primary escape routes
- The firefighting equipment provided
- Specific responsibilities in the event of a fire
- Training requirements
- Provision of information to relevant persons

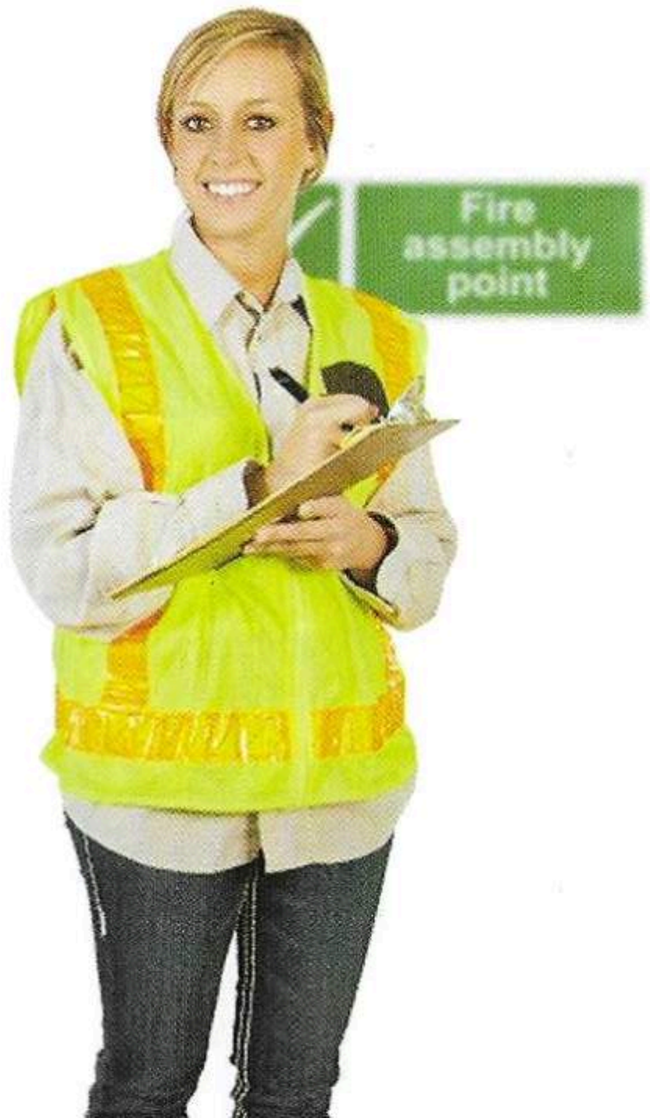
The emergency plan should be practised and if necessary discussed with the local fire service.

The Role and Responsibilities of a Fire Warden *(or fire marshal)*

The principal duty of a fire warden is to make sure people are safely evacuated in the event of a fire. This is achieved by checking a designated area in a methodical manner *(normally the section of a building where they work)*.

A fire warden may also be asked to assist the 'responsible person' with implementing other fire safety measures. These duties could include:

- Monitoring fire safety, e.g. checking fire exits are unlocked and unblocked inside and outside
- Reporting faults/unsafe practices/incidents
- Giving fire safety briefings to make sure all staff know what to do in the event of a fire
- Assisting with the FSRA
- Assisting with Personal Emergency Evacuation Plans *(PEEP)* for anyone who will need help during an evacuation
- Helping with the emergency plan



Fire wardens must receive appropriate training for the duties that they have been assigned and this should be followed by regular refresher training.

Those best suited to the role of fire warden will be volunteers with:

- Good reliability
- First-rate communication skills
- The ability to organise
- The aptitude to gain new skills and knowledge
- The physical ability to carry out the role in an emergency

The number of fire wardens needed should be based on the time it takes to check the designated areas in the building. It is important that no area is so large that it cannot be checked quickly. A fire warden will usually be the last person to leave their area but the check should not take so long that it delays their safe escape from the building.

Deputies should be appointed and trained to cover the times when a fire warden is absent, e.g. sickness, holidays. Cover is needed at all times when 'relevant people' are in the building. If if a shift system *(or flexi time)* is in operation, additional fire wardens will be required.

The Fire Warden's Duties When the Alarm is Raised

When the fire alarm is activated the fire warden should put on a high visibility jacket to make them easily identifiable to staff and to the fire service when they arrive. If people working in the area already wear high visibility jackets, a 'lollipop stick' with 'Fire Warden' written on it could be used or a different coloured jacket may be another option.

If the fire warden is not close to their area when the alarm is raised, they should go straight to their assembly point. They should never attempt to go against the flow of people trying to leave the building to get back to their area. Ideally there should be a deputy to take over their duties if this happens.

When checking a designated area, the fire warden should work towards the fire escape that they intend to use, closing windows and doors behind them *(this will reduce the speed that fire can spread)*. It is crucial that everyone is accounted for *(this is why signing in and out is so important)*.

At the assembly point the fire warden should report to the person in charge and let them know if:

- They were unable to check any locations within their area
- Anyone has refused to leave the building
- There is any other relevant information that they should be aware of

Note: If the assembly point is affected by the fire, move people to an alternative safer area that will not obstruct the fire service when they arrive.

When the fire service arrives, the person in charge should make themselves known. Fire wardens should be on hand in case they are required to give information about their area.

On arrival the fire service will want to know:

- If everyone is accounted for
- Where the fire panel is located
- If anyone knows what activated the alarm and which area it was in
- If there are any special hazards they should know about

Fire Safety Duties

There are a number of important duties that must be carried out periodically to ensure fire safety in the workplace. Ultimate responsibility for these duties lies with the 'responsible person', but they can be passed on to 'competent person(s)' that have received adequate training. This is not an exhaustive list and the time periods may need to be adjusted dependant on the risks present in each workplace.

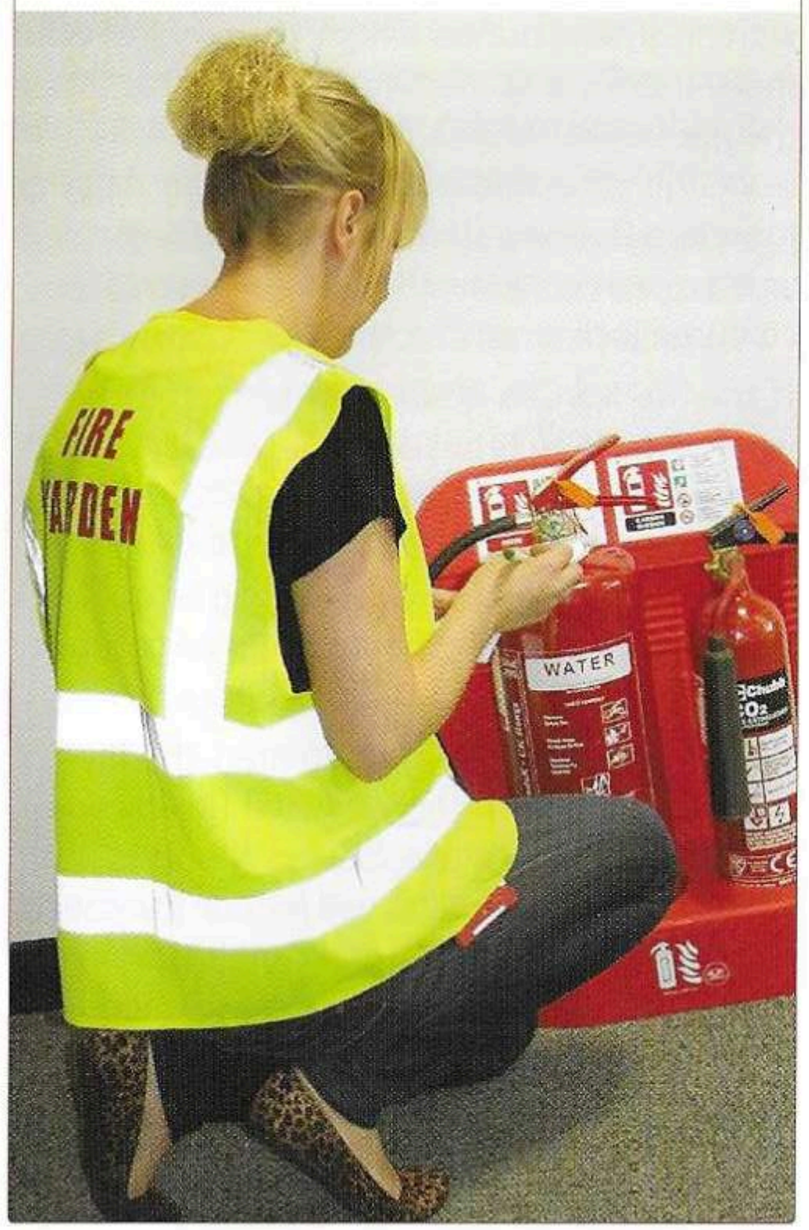
Regular Checks *(usually weekly)*

Check:

- Fire alarm is tested *(activated from a different call point each time)*
- General housekeeping around the building is satisfactory
- For any changes that could affect the Fire Safety Risk Assessment
- Fire doors are not wedged open and are in working order
- Escape routes and fire exits are free from obstructions from inside and outside
- Fire alarm panel is on and in working order
- No combustible materials are stored in corridors
- All alarm call points are accessible
- Fire safety signs are in place and visible
- Fire extinguishers *(see page 17)*
- Assembly points are not obstructed

Other Periodic Checks

- Confirm that the emergency lights work *(monthly)*
- Arrange fire drills *(at least once a year)*
- Make sure portable firefighting equipment is serviced *(annually)*
- Make sure that portable electrical equipment is tested
- Make sure fixed firefighting equipment is serviced



Home Fire Safety Checks

Fire Detectors

As a minimum, every home should have at least one working smoke detector per floor. The detector*(s)* should be located to cover your 'means of escape' *(the quickest and safest way out from your bedroom to an external door)*. The detector should be tested regularly *(weekly)* and every month it should be vacuumed to remove any dust particles.

Night-time Routine

It is good practice to get into a routine so that every night you go around checking everything is switched off, locked and closed. After a short time, this becomes second nature.

- Switch off all sockets *(don't leave TVs on standby)*
- Close all doors
- Turn off fires
- Make sure cigarettes are extinguished properly
- Make sure candles are extinguished
- Lock doors and either keep the key near the door or take the key to bed with you. It is important that you and everyone in the house knows where the key is. Think – if you have left the key in the kitchen and it's on fire, how will you get out?
- Have a mobile/landline by the bed
- Make sure your escape route is clear. This should be your normal way out of the house. Choose an alternative route in case this gets blocked by fire

Smoking

- Never leave a cigarette burning in an ashtray
- Always use a sturdy/proper ashtray
- Avoid smoking while tired or under the influence of alcohol or drugs
- Always empty the ashtray outside as part of your night-time routine

Chip Pans/Deep Fat Fryers

If possible avoid using chip pans. If you do use them:

- Make sure the pan/fryer is only one third full
- Never leave unattended, even to answer the door/telephone
- If the pan/fryer starts to smoke, turn off and leave to cool
- Make sure food is dry before you put it into the pan/fryer

If a pan/fryer catches fire:

- Don't try to move it as it will be very hot
- Turn off the heat if it is safe to do so *(don't lean over the pan)*
- Never use water on chip pan fires – this will cause a fireball
- Use a fire blanket, if it is safe to do so, to smother the flames *(most fire extinguishers are not designed for this type of fire and could make things worse)*
- **If in doubt – get out, stay out and call 999**

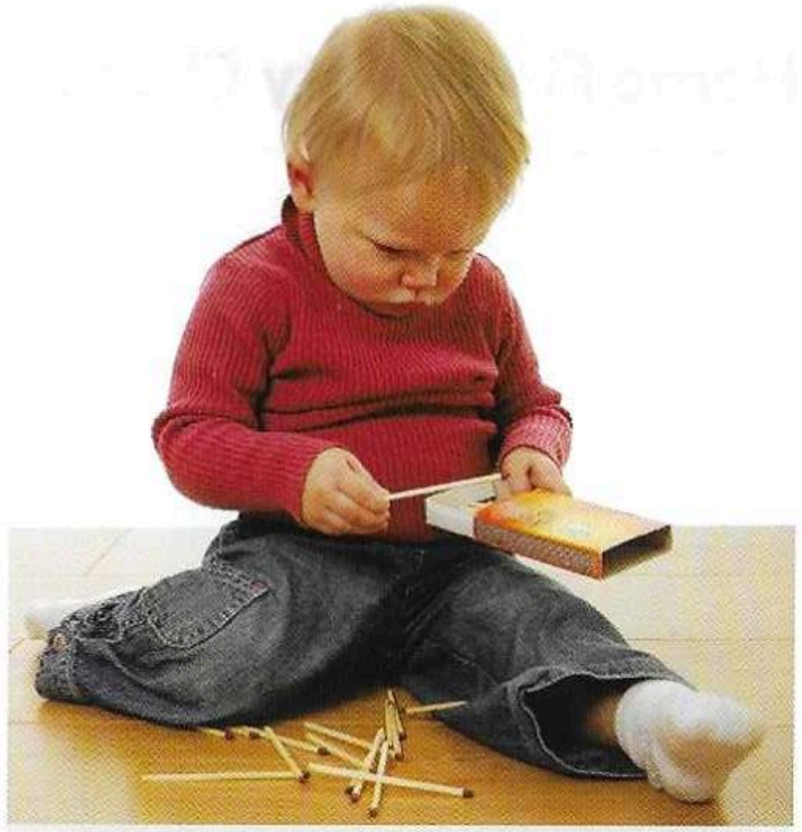
In the Kitchen

A lot of fires start in the kitchen. Basic rules and common sense will avoid any mishaps:

- Never leave pans unattended on the stove
- Clean grill pans/ovens regularly so the build-up of grease doesn't ignite
- Don't overload sockets or allow flexes to run over cookers
- Pull toasters out from under units to avoid build up of heat under units
- Keep matches/lighters out of reach of children

Around the House

- Make sure all cables/flexes are in good condition and do not run under carpets/floor covers
- Make sure all doors close into door frames
- Get gas/electric appliances serviced annually
- Make sure there are no light bulbs/candles near curtains or other fabric
- Never leave candles unattended and make sure you extinguish them properly
- Always use the correct candle holder
- Never put tealights on plastic surfaces such as baths
- Make sure heaters are at least one metre away from any fabrics
- Use a fire guard where there are children/ babies
- Never dry clothes on top of a fire guard



Always keep matches and lighters out of reach of children.

Make an Escape Plan

Make sure everyone knows:

- What to do if they hear the alarm go off
- Who is going to call 999
- What to do if the 'normal' route out of the house is blocked
- Where you will meet outside

If You Catch Fire

- **Stop** – don't run around as this will fan the flames
- **Drop** – lay down on the floor so the flames do not burn upwards towards your face/head
- **Roll** on the floor and wrap in a blanket or jacket if possible
- Dial 999

Test Your Knowledge

1 *On which sort of fire could you use a foam extinguisher?* *Pages 18 & 20*

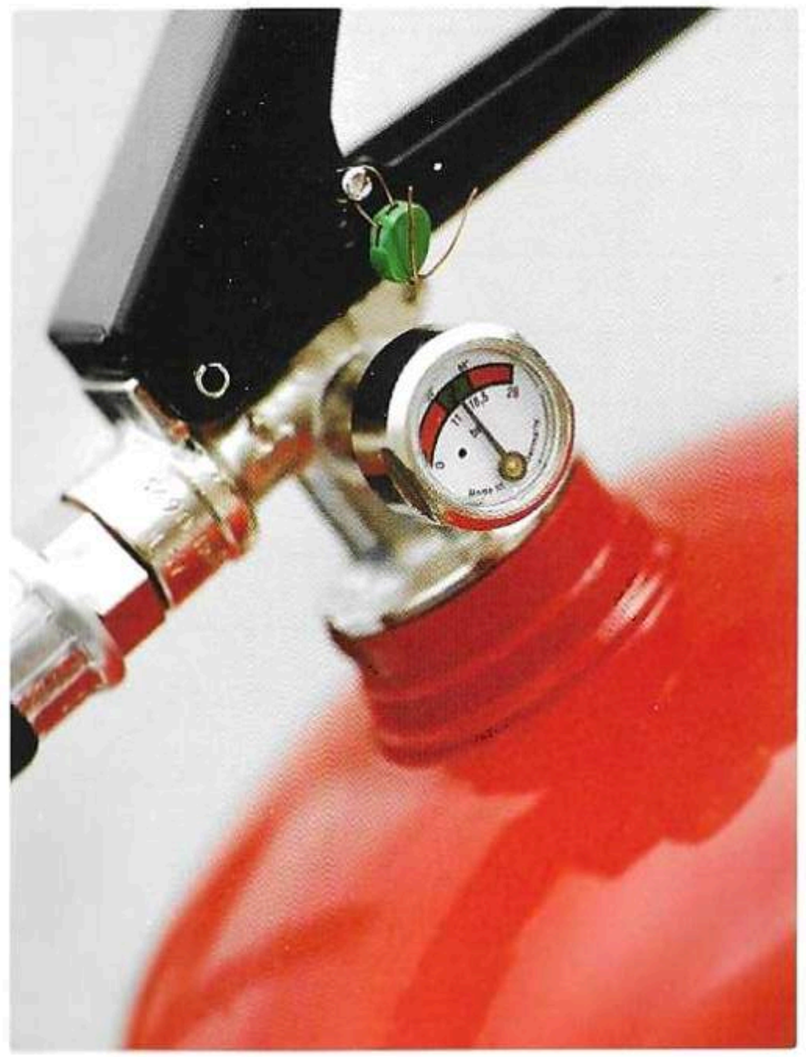
A Chip pan.
B Petrol.
C Cooking oil.
D Electrical.

2 *Which of the following is an element of the fire triangle?* *Page 5*

A Water.
B Carbon dioxide.
C Heat.
D Foam.

3 *Which of the following is not a source of fuel?* *Page 5*

A Textiles.
B Rubbish.
C Oxygen.
D Wood.



4 *Which of the following is an active control measure?* *Page 8*

A Compartmentation.
B Fire exits.
C Signage.
D Fire alarm.

5 *What should fire exits be?* *Page 14*

A Signed from the inside of the building.
B Inward opening.
C Kept locked until they are needed.
D Obstructed from the outside of the building.

6 *In the early stages, how is fire is usually spread?* *Page 6*

A Backdraught.
B Convection.
C Direct contact.
D Flashover.

7 *Which action is NOT recommended when you hear the fire alarm?* *Page 22*

A Leaving the building by the most appropriate escape route.
B Collecting your belongings.
C Closing doors and windows behind you if you are the last to leave.
D Staying calm and acting immediately.

8 *Which of the following is NOT classed as fixed firefighting equipment?* *Page 16*

A Wet riser.
B Gas flooding system.
C Fire blanket.
D Foam system.

Notes

Notes