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Fire Extinguishers

Whatever type or make of fire extinguisher you choose, make sure it conforms to the appropriate British Standards (BSEN3 and BS7863). Look for the Kitemark or the special British Approvals for Fire Equipment (BAFE) mark.

Class of fire	Image	Type of fire	Fire Extinguisher
A		**Combustible solids** such as paper, wood, plastic	Water, foam, dry powder, wet chemical
B		**Flammable liquids** such as paraffin, petrol, oil	Dry powder, foam, CO2
C		**Flammable gases** such as propane, butane, methane	Dry powder, CO2
D		**Flammable metals** such as aluminium, magnesium, titanium	Specially formulated dry powder
E		**Electrical hazards**	CO2, dry powder
F		**Cooking oil and fat**	Wet chemical

Which fire extinguisher should you choose?

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Carbon Dioxide (CO2)
Dry Powder (Multi-purpose)
Dry Powder (Standard)
Foam (AFFF - Aqueous Film-Forming Foam)
Foam
Water
Water Spray
Wet Chemical

Type	How it works / Danger of use

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Carbon Dioxide (CO2)

Black	
Best for:	Live electrical equipment when it is not possible to isolate the electric supply and flammable liquids such as grease, fats, oil paint, petrol etc. but not on domestic chip or fat pan fires.
Danger:	**Warning: The extinguisher sounds a loud noise when started.** Do not use on domestic chip or fat pan fires. This type of extinguisher does not cool the fire very well and you need to watch that the fire does not start up again. Fumes from CO2 extinguishers can be harmful if used in confined spaces: ventilate the area as soon as the fire has been controlled. Do not hold the horn whilst in use as it becomes very cold.
How to use:	The discharge horn should be directed at the base of the flames and the jet kept moving across the area of the fire.
How it works:	Carbon dioxide extinguisher works on classes B and C and works by suffocating the fire. Carbon dioxide will not burn and displaces air.

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Dry Powder - Multi-purpose

Blue	
Best for:	Can be used on fires involving organic solids, liquids such as grease, fats, oil, paint, petrol,etc **but not on chip or fat pan fires**.
Danger:	**Important: never mix powders** - only extinguishers containing the same type of powder should be used at the same time. Safe on live electrical equipment, although does not penetrate the spaces in equipment easily and the fire may re-ignite. This type of extinguisher does not cool the fire very well and care should be taken that the fire does not flare up again. Smoldering material in deep seated fires such as upholstery or bedding can cause the fire to start up again. **Do not use on domestic chip or fat pan fires.**
How to use:	Point the jet or discharge horn at the base of the flames and, with a rapid sweeping motion, drive the fire towards the far edge until all the flames are out. If the extinguisher has a shut-off control wait until the air clears and if you can still see the

	flames, attack the fire again.
How it works:	Similarly to almost all extinguishing agents the powders acts as a thermal ballast making the flames too cool for the chemical reactions to continue. Some powders also provide a minor chemical inhibition, although this effect is relatively weak. These powders thus provide rapid knockdown of flame fronts, but may not keep the fire suppressed.

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Dry Powder - Standard

Blue	
Best for:	Liquids such as grease, fats, oil, paint, petrol etc but not on domestic chip or fat pan fires.
Danger:	**Important: never mix powders** - only extinguishers containing the same type of powder should be used at the same time. Safe on live electrical equipment, although does not penetrate the spaces in equipment easily and the fire may re-ignite. This type of extinguisher does not cool the fire very well and care should be taken that the fire does not re-ignite. **Do not use on domestic chip or fat pan fires.**

How to use:	Point the jet or discharge horn at the base of the flames and, with a rapid sweeping motion, drive the fire towards the far edge until all the flames are out. If the extinguisher has a shut-off control wait until the air clears and if you can still see the flames, attack the fire again.
How it works:	Similarly to almost all extinguishing agents the powders acts as a thermal ballast making the flames too cool for the chemical reactions to continue. Some powders also provide a minor chemical inhibition, although this effect is relatively weak. These powders thus provide rapid knockdown of flame fronts, but may not keep the fire suppressed.

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Foam - AFFF (Aqueous Film-Forming Foam)

Cream	
Best for:	Fires involving solids. Liquids such as grease, fats, oil, paint, petrol,etc but not on domestic chip or fat pan fires. Can be used on class A fires but not recommended.
Danger:	Do not use on domestic chip or fat pan fires.

How to use:	For fires involving solids, point the jet at the base of the flames and keep it moving across the area of the fire. Ensure that all areas of the fire are out. For fire involving liquids, do not aim the jet straight into the liquid. Where the liquid on fire is in a container, point the jet at the inside edge of the container or on a nearby surface above the burning liquid. Allow the foam to build up and flow across the liquid.
How it works:	They are mainly water based, with a foaming agent so that the foam can float on top of the burning liquid and break the interaction between the flames and the fuel surface.

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Foam

Cream	
Best for:	Fires involving solids. Liquids such as grease, fats, oil, paint, petrol,etc but not on domestic chip or fat pan fires. Can be used on class A fires but not recommended. Less effective than AFFF foam

Danger:	Check manufacturer's instructions for suitability of use on other fires involving liquids. These extinguishers are generally not recommended for home use.
How to use:	Do not aim jet straight into the liquid. Where the liquid on fire is in a container, point the jet at the inside edge of the container or on a nearby surface above the burning liquid. Allow the foam to build up and flow across the liquid.
How it works:	These are mainly water based, with a foaming agent so that the foam can float on top of the burning liquid and break the interaction between the flames and the fuel surface.

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Water

Red	
Best for:	Fires involving organic solid materials such as wood, cloth, paper, plastics, Coal etc.
Danger:	Do not use on burning fat or oil or on electrical appliances.

How to use:	Point the jet at the base of the flames and keep it moving across the area of the fire. Ensure that all areas of the fire are out.
How it works:	Water has a great effect on cooling the fuel surfaces and thereby reducing the pyrolysis rate of the fuel.

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Water Spray

Red	
Best for:	Fires involving organic solid materials such as wood, cloth, paper, plastics, Coal etc. Size for size, it offers up to 300% more fire fighting capability than traditional jet type water fire extinguishers. Available in 3 and 6 litres.
Danger:	Do not use on burning fat or oil or on electrical appliances.
How to use:	Point the jet at the base of the flames and keep it moving across the area of the fire. Ensure that all areas of the fire are out.
How it works:	Water has a great effect on cooling the fuel surfaces and thereby reducing the pyrolysis rate of the fuel. Instead of a jet nozzel a spray nozzel is used, with a higher pressure, which creates a fine spray . This allows for a given quantity

	of water to have a considerable increase in the surface area presented to the fire. This makes extinguishing more efficient by more rapid extraction of heat, formation of steam etc. They can also contain surfactants which help the water penetrate deep into the burning material which increase the effectiveness of the extinguisher.

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Wet chemical

Yellow	
Best for:	The specialist wet chemical extinguishers are ideal for Class F fires, involving cooking oils and fats, such as lard, olive oil, sunflower oil, maize oil and butter.
Danger:	Check manufacturer's instructions for suitability of use. **These extinguishers are not recommended for class B fires and home use.**
How to use:	Apply the wet chemical using the extended applicator in slow circular movements, which give a gentle, yet highly effective application. Apply the fine spray onto the burning fat until the surface of the burning cooking oil changes into a soapy like substance, this then prevents re-ignition. The gentle

	application helps prevent hot oil splashing onto the user.
How it works:	Most class F extinguishers contain a solution of potassium acetate, sometimes with some potassium citrate or potassium bicarbonate. The extinguishers spray the agent out as a fine mist. The mist acts to cool the flame front, while the potassium salts saponify the surface of the burning cooking oil, producing a layer of foam over the surface. This solution thus provides a similar blanketing effect to a foam extinguisher, but with a greater cooling effect. The saponification only works on animal fats and vegetable oils, so class F extinguishers cannot be used for class B fires. The misting also helps to prevent splashing the blazing oil. Tests have established that a 6 litre extinguisher is capable of extinguishing a fire in a 75 litre capacity deep fat fryer. The extinguisher is easy to use producing a gentle but highly effective spray.

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Further information

British Approval for Fire Equipment (BAFE)	**www.bafe.org.uk**
Fire Extinguishing Trades Association	**www.feta.org.uk**
Fire fighting products	**www.bsi-global.com**

BSI
Provides links to selected Kitemark® Fire Safety Product Standards.