

Chemical Safety and Security

Third Lecture

First stage

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Occupational safety and health

Fires, Types, Ways to deal with each type

Fires:

Fire is a form of a chemical reaction that involves the rapid oxidation of combustible fuel (material) with the subsequent liberation of heat and light.

What causes a fire?

Fires start when a flammable or a combustible material, in combination with a sufficient quantity of an oxidizer such as oxygen gas or another oxygen-rich compound (though non-oxygen oxidizers exist), is exposed to a source of heat or ambient temperature above the flash point for the fuel/oxidizer mix.

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What is fire types?

Choose the Right Fire Extinguisher_Different types of fire extinguishers exist in order to address the 5 different classes of fires.

Each fire class describes the fuel or material a fire is burning or what caused it to start therefore, using the right extinguisher is essential to put out the fire safely.

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General lab safety rules

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Fire Class	Fuel Type	How to Suppress	Fire Extinguisher Type
Class A	Freely burning combustibles	Water, Smothering	ABC/powder, water, water mist, foam
Class B	Burning liquid or gas	Smothering	ABC/powder, CO2, water mist, clean agent
Class C	Electrical fire	Non-conductive chemicals	ABC/powder, CO2, water mist, clean agent
Class D	Metallic fire	Dry powder agent	Powder
Class K	Cooking or grease fire	Smothering, wet chemical	Wet chemical, water mist

- Choosing fire extinguisher types for the relevant class of fire could literally be the difference between life and death. So here's a useful guide on how to choose the right type and class of fire extinguisher for the appropriate scenario, including color codes, fire classes and uses.

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- No single extinguisher can be used to tackle every fire, and because each type of fire extinguisher has different categories of fire on which it is effective, selection can be a minefield.

Main types of fire extinguishers:

There are five different fire extinguishers, which are :

- 1- Water, water mist or water spray fire extinguishers
- 2- Foam fire extinguishers
- 3- Dry Powder – standard or specialist fire extinguishers
- 4- Carbon Dioxide ('CO₂') fire extinguishers
- 5- Wet Chemical fire extinguishers


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Fire extinguisher types chart

This chart visualizes the fire extinguisher types used and the types of fire for which they are suitable, as well as their color codes.

Symbols found on fire extinguishers & what they mean

						
		Water	Foam spray	ABC powder	Carbon dioxide	Wet chemical
Wood, paper & textiles		✓	✓	✓	✗	✓
Flammable liquids		✗	✓	✓	✓	✗
Flammable gases		✗	✗	✓	✗	✗
Electrical contact		✗	✗	✓	✓	✗
Cooking oils & fats		✗	✗	✗	✗	✓

1-Water extinguishers: are only used for Class A fires. Therefore, red coded extinguishers can be used to tackle fires caused by ignited paper, wood, straw, coal, rubber, solid plastics and soft furnishings. Water fire extinguishers work by spraying water from the spray nozzle, which helps to cover larger surface area. They are the simplest, most common



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2- Water spray fire extinguishers:

Available in three and six liters, water spray fire extinguishers are suitable to fires involving organic solid materials such as wood, cloth, paper, plastics or coal. Use on burning fat or oil or on electrical appliances is a big no-no.

Use involves pointing the jet at the base of the flames and moving it constantly and steadily across the fire until extinguished.

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Thank you