Unit 201: Health and safety in building services engineering

Outcome 4

Safety requirements for working with gases and heat producing equipment

Gases

Bottle gas	Cylinder colour	Thread direction
Propane	Red	Left hand
Butane	Blue	Left hand
MAPP (mix)	Yellow	Left hand
Acetylene	Maroon	Left hand
Oxygen	Black	Right hand

Oxyacetylene equipment

- Main control valve
- Pressure regulator
- Gauges
- Flashback arrestor
- Hoses
- Torch
- Torch control valve
- Nozzle.

LPG equipment

- Liquefied Petroleum Gas: a group of gases that includes propane and butane
- Highly flammable when mixed correctly with air
- **Heavier** than air
- Propane turns from liquid to gas at -42^{0}C
- If drawn off too quickly, the valves can freeze
- Used and stored in well-ventilated and signed areas
- CO_2 can build up in confined spaces
- When in use, a CO_2 fire extinguisher must be present.

Gas equipment

Visually inspect equipment:

- Damage to hoses
- Damage to valves
- Damage to gauges
- Damage to threaded connectors
- Leak detection fluid on joints.

Gas

Store the cylinder upright, outside, in a well-ventilated lockable store, with labels.

- If transporting gas, keep cylinders upright with ventilation, in an enclosed vehicle, and label on outside
- If transporting quantities of gas, the driver must be in possession of a **Tremcard**. Covered by Carriage of Dangerous Goods by Road Regulations.

Dangers

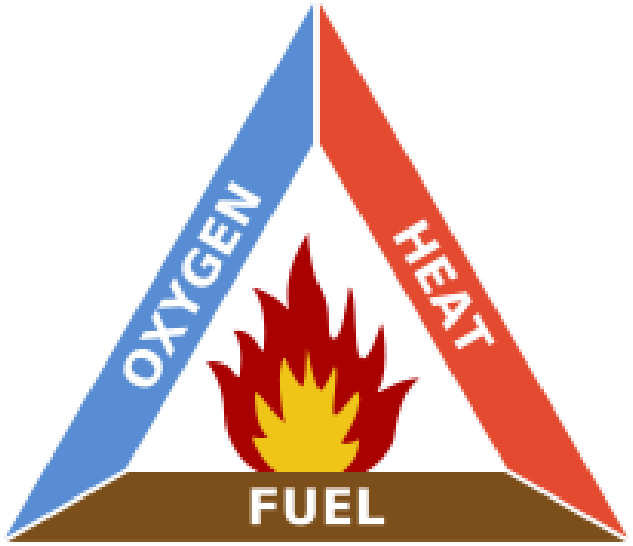
- LPG in cellars
- Stored near drain entrances
- Flammable
- Flames in loft areas – dust and insulation
- Build up of CO_2 or CO in confined spaces
- Burns to property and persons – nozzle and component
- Cold burns from valve and cylinder
- Leaks.

Fires

Fire is one of the most destructive elements.

Combustion is a chemical reaction with oxygen ie:

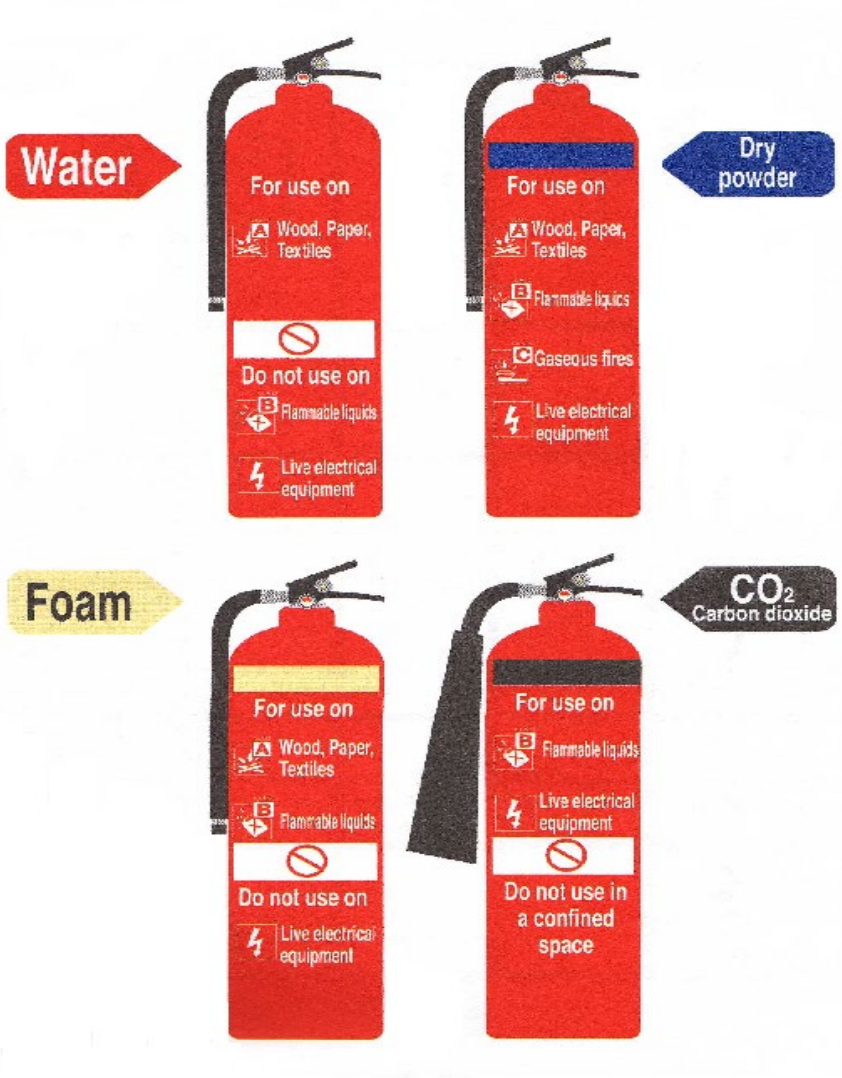
Fuel + oxygen + heat = fire
Propane + oxygen + spark = flame



Fires

Class A	Solids – wood, paper, plastic
Class B	Flammable liquids – oil, paraffin
Class C	Flammable gases – LPG, natural gas
Class D	Metals – aluminium, magnesium
Class E	Electrical
Class F	Cooking oils and fats

Fire extinguishers



Care should also be taken when using CO2 extinguishers in an enclosed space – asphyxiation

Fire extinguishers

RED	WATER	A
CREAM	FOAM	A & B
BLUE	POWDER	B & Elec
BLACK	CO_2	Elec

Fires

- Carry a dry powder or CO_2 extinguisher when soldering
- Use a heatproof mat next to building fabrics (resistant)
- Move furniture away from soldering area
- Do not point a blowtorch directly at combustible material
- When soldering under a suspended floor, check for anything that could catch fire
- Do not replace floorboards until you have inspected for smouldering under the boards
- When lead welding on a roof, damp off the substrate
- Stop soldering an hour before you leave.