

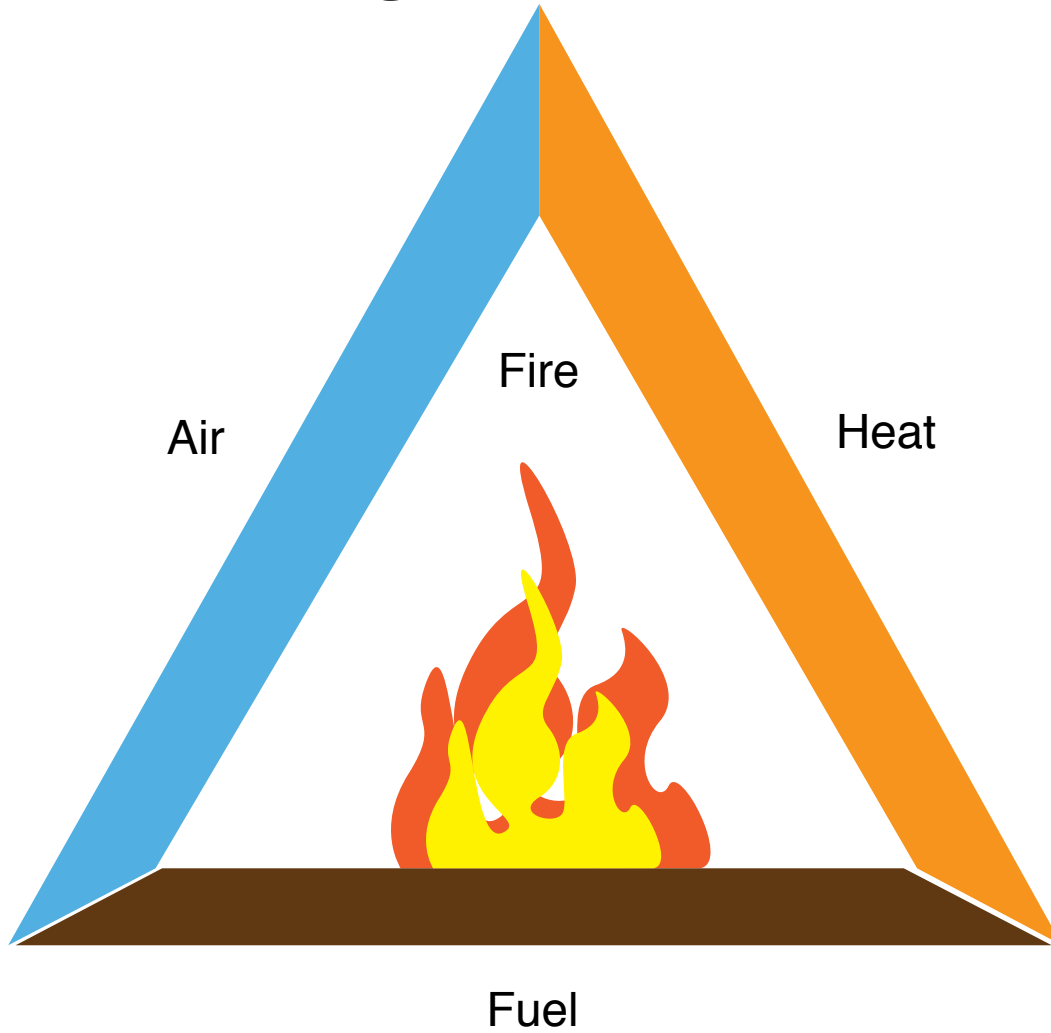
FIRE FIGHTING



TYPES OF FIRES

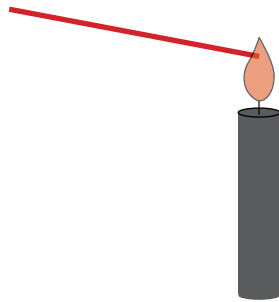
- CLASS A: Wood, paper, cloth, trash and other ordinary materials.
- CLASS B: Gasoline, oil, paint and other flammable liquids.
- CLASS C: May be used on fires involving live electrical equipment without danger to the operator.
- CLASS D: Combustible metals and combustible metal alloys.

THE FIRE TRIANGLE



TRANSFER OF HEAT

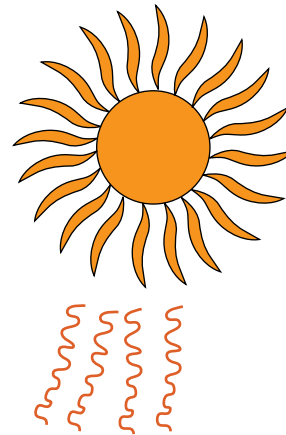
- Conduction: Contact
- Convection: Moving air or water
- Radiation: Infra-red radiation



Conduction



Convection



Radiation

EXTINGUISHING AGENTS

Water

- A direct stream from a comb nozzle
- Removes heat by vaporization
- Should only be used on Type A fire
 - If used on type B fire you will only spread the flames

Extinguishers:

- High velocity = 25-35ft range
- Low velocity = 5ft range



EXTINGUISHING AGENTS

Foam

- Should only be used to extinguish type A and B fires
- Disadvantage: leaves a messy residue



EXTINGUISHING AGENTS

Carbon Dioxide

- Extinguishes by smothering
- Can be used for types A, B and C

Advantages:

- non-conductive
- will not leave a residue

Disadvantage:

- due to its gaseous nature it is most effective in small spaces
- danger of suffocation
- little cooling effect which will make it less effective on type A fires



EXTINGUISHING AGENTS

Dry Powders

- This is specific for class D fires



EXTINGUISHING AGENTS

Dry Chemicals

- Extinguish by smothering
- Used on A,B, and C fires
- Like CO₂ have little cooling effect so least effective on type A fires
- Disadvantages: residue and possible flashback with class B fires



EXTINGUISHING AGENTS

Halon

Advantages:

- May be used on all classes of fires
- Residue-free gas that acts as a chain-breaker

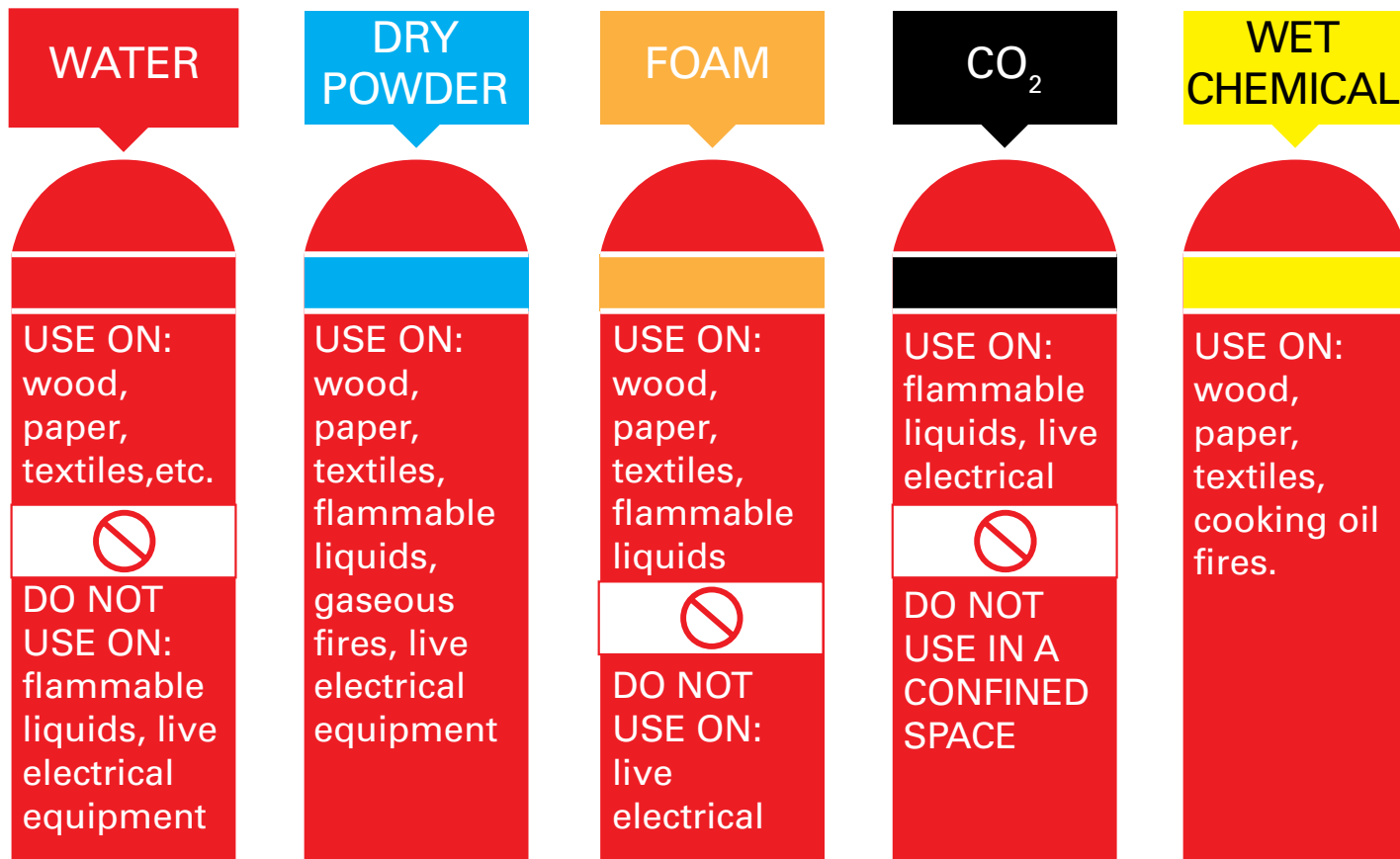
Disadvantages:

- Damaging to environment - No longer produced for fire extinguishing, but existing units may still be used
- Like CO₂, there is the danger of suffocation.



FIRE SAFETY

Types of fire extinguishers:



USCG REQUIREMENTS

The Coast Guard classifies extinguishers as class B-I or B-II.

Classes	Foam (gal)	CO ₂ (lbs)	Dry Chemicals (lbs)
B-I	1.25	4	2
B-II	2.5	15	10

The Coast Guard requires that

- Boats < 26ft carry 1 B-I extinguisher
- Boats 26'-40' carry 2 B-I or 1 B-II extinguisher
- Boats 40'-65' carry 3 B-I, or 1 B-I and 1 B-II

PREVENTING FIRES

- Keep vessel clean and orderly, with proper stowage of fuel and gear
- Regularly inspect the vessel's fueling system to ensure all fittings, hoses and tanks are in proper condition.
- Never leave any flammable liquids such as motor fuel in open containers.
- Always check heating and cooking appliances on board are properly secured.
- Keep the galley clean and grease-free
- Keep all Coast Guard approved fire extinguishers in working order
- Alert all crew and guests to take special precautions when smoking.
- Conduct daily checks of vessel for everyday fire risks

COMPARTMENT TESTING

- Before anyone enters a space suspected of possible explosive vapors or lack on oxygen, a check should be done using an
 - Oxygen Indicator
 - Measures the concentration of O₂
 - Flame Safety Lamp
 - Used to test for oxygen in space with no combustible gases
 - Normal O₂ concentrations are 21%.
 - The flame will extinguish at 16%
 - Become unconscious due to lack of O₂ between 16 -10 %
- Combustible Gas Indicator
 - Measure the concentration of combustible gases