SUBJECT: BASICS OF FIRE SCIENCE

INTRODUCTION TO FIRE EXTINGUISHERS

Presented by

Jitender Narwal
HOD, FTS
GITAM, KABLANA

Water Extinguisher

- They are used for Class Afires.
- Water removes heat and extinguish the fire.
- Water must not be used on fires involving live electrical equipment as it can cause electrocution.
- Water must not be used on metal fires.

Carbon Dioxide Extinguisher

- CO_2 extinguishers are mainly used for Class B and C fires.
- CO_2 extinguish the fire by displacing oxygen in the surrounding air.

Carbon Dioxide Extinguisher

- CO_2 is not suitable for fires involving metals.
- It's principal advantage is that it does not leave any residue.
- Can be used on electrical/electronic equipment.

AFF Foam Type Extinguishers

- The extinguishing agent is aqueous film forming concentrate in water which forms air foams when discharged through an aspirating nozzle.
- It has a blanketing effect excluding oxygen from the surface of the fuel as it spreads on the fuel.
- Prevents vapour formation from the surface of the burning liquid.

AFF Foam Extinguishers

- It develops a floating aqueous film of solution under the foam on fuel surface and cool the burning surface.

- AFF extinguishers must not be used on electrical and metal fires.

Dry Chemical Powder(DCP) Extinguisher

- The main base chemicals used in DCP extinguishers are sodium bicarbonate and potassium bicarbonate.
- DCP extinguishers puts out fire by coating the fuel surface with chemical powder.
- This separates the fuel from the oxygen in the air and prevent vapor formation.

Dry Chemical Powder(DCP) Extinguisher

- The powder also interrupts the chemical chain reaction of fire.
- The disadvantage is that it leaves residue particularly making it difficult to clean up in case of sensitive equipment.

Special Dry Powder Extinguisher

- Special extinguishing agents are used for extinguishing metallic fires.
- Dry powders extinguish the fire by forming a crust on metal surface excluding air and also absorbs heat from the metal surface.
- E.g., Blended sodium chloride based dry powder, ternary eutectic chloride(TEC) powder, graphite etc.

Summary of Fire Extinguishers

Type of extinguishers and the classes of fire for which they can be used	
Water	Class A fire
Dry chemical powder	Class B & C fire
Foam	Class A & B fire
Carbon dioxide	Class B & C fire
Special dry powder	Class D fire

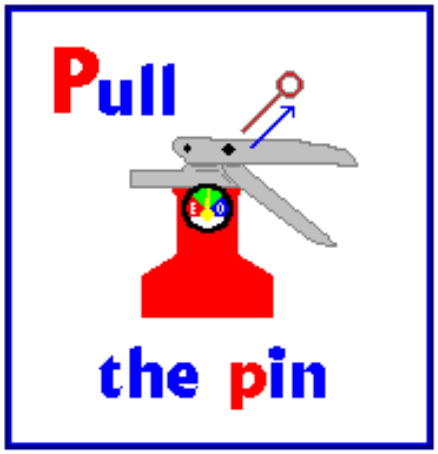
Propellant for extinguishing media.

- The extinguishing media is expelled from the extinguisher by carbon dioxide gas contained in a cartridge inside the extinguisher.

- CO_2 extinguisher contains liquefied carbon dioxide. The gas present in the vapour space above the liquefied CO_2 itself acts as the propellant. So no separate cartridge is used in CO_2 extinguisher.

How to Use an Extinguisher

Pull Aim Squeeze Sweep



- Pull the pin this will allow you
- to discharge the extinguisher
- Get the hose or nozzle ready for
- use

- Aim at the base of the fire to
- hit the fuel…if you aim at the
- flames the extinguishing agent
- will pass through and do no
- good

How to Use an Extinguisher

Pull Aim Squeeze Sweep

- Squeeze the top handle, this
- depresses a button that releases
- the pressurised extinguishing
- agent

Sweep from side-to-side until the fire is completely out

Remember: Start using the extinguisher from a safe distance away, say 2-3m, and then slowly move forward. Once the fire is out, keep an eye on the area in case it reignites.

Fire Signs


Fire action
Any person discovering a fire
1 Sound the alarm.
2 to call fire brigade.
3 Attack the fire if possible using the appliances provided.
On hearing the fire alarm
4 Leave building by route.
5 Close all doors behind you.
6 Report to assembly point.
Do not take risks
Do not return to the building for any reason until authorised to do so.
Do not use lifts.


Fire call point


Fire
extinguisher


FIRE
EXIT

Extinguisher Operation

- Pull/remove the locking clip.
- Aim the nozzle at the base of the fire.
- Press the knob down.
- Starting from the edge of the fire sweep the nozzle from side to side advancing ahead.

Knob

Locking clip

Can be used for Class A & B fires

Air aspirating nozzle

Operating Foam type Extinguisher

- When using AFFF on a container of burning liquid the foam must be directed towards the back or side wall of the container and allowed to spread over the surface.

- Where the fire is in a liquid spill the foam must be allowed to drop slightly ahead of the fire and moved forward with a side to side movement of the nozzle.

Extinguisher Operation

- Pull/remove the locking pin.
- Aim the nozzle at the base of the fire.
- Press the lever down.
- Starting from the edge of the fire sweep the nozzle from side to side advancing ahead.

Operating a CO_2 extinguisher

- Remove the locking pin.
- Aim the horn at the base of the fire.
- Open the valve by turning it anticlockwise.
- Sweep the horn from side to side, gradually advancing ahead.

Locking pin

Valve

Can be used for Class B & C fires

Discharge horn

Extinguishing Fire

The successful use of a fire extinguisher depends on the following conditions:

- The extinguisher must be easily accessible and in good working order.
- The extinguisher must be the right type for the fire.
- The fire must be discovered in its incipient stage for the extinguisher to be effective.

THANKS