

FIRE FIGHTING



STC/SBC

FIRE

Å Chemical Combustion Or Fire

Å It is a rapid chemical oxidation reaction

Å Which Gives

- ï Heat
- ï Light
- ï With Smoke and Fumes

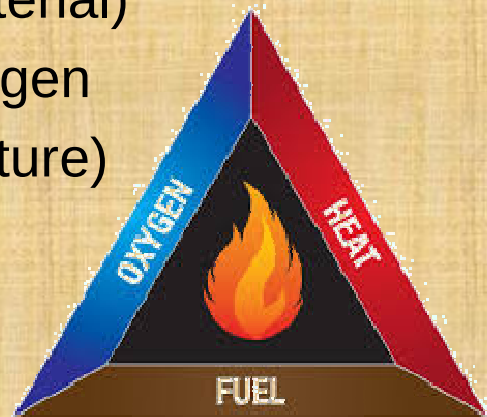


FIRE TRIANGLE

Å To Start & Continue Chemical Combustion Or Fire

Å Three Factors are Required

- ï Fuel (Combustible Material)
- ï Atmospheric Air or Oxygen
- ï Heat (Ignition Temperature)



CLASSIFICATION OF FIRE

Å Depending upon the combustible material fires are classified as

Å Class-A

Å Class-B

Å Class-C

Å Class-D

CLASS-A FIRE

All carbonaceous materials .

Which leave the carbon residue after they burn.

Examples;

Paper, rubber, wood, dry leaves etcé é

CLASS-B FIRE

All Combustible liquids.

Examples;

Petrol, Diesel, Kerosene, Alcohols, Thinner,
Edible Oils, Paints etcé é

CLASS-C FIRE

All Combustible Gasses.

Examples;

LPG, CNG, Ethane, Methane, Acetylene,
Propane, Butane, etcé é

CLASS-D FIRE

All Combustible Metals.

Examples;

Uranium (u)

Barium (ba)

Sodium (na)

Potassium(k)

Calcium (ca)

Magnesium (mg)

Aluminium(al)

Zinc (zn)

Zirconium (zr) etcé é

STOP/EXTINGUISH FIRE

Removal of any one of the 3 factors.

Fuel

Oxygen

Heat

Can Extinguish Fire.

FIRE EXTINGUISHING METHODS

- Å Starvation method
- Å Cooling method
- Å Blanketing method(Smothering)

STARVATION METHOD

- Å Removal of Fuel is called Starvation method
- Å Removal of Fuel can be done by:
 - ï Pumping out of Fuel
 - ï Shutting of Gas Flow
- Å Used in Class-A Fires

COOLING METHOD

- Å Reducing of Heat from Burning Material
- Å Below Ignition Temperature
- Å Most efficient Coolant is Water
- Å Used Only In Class-A Fires

BLANKETING (SMOTHERING) METHOD

- Å Dilution Oxygen
- Å Removal of Oxidizing agent/Oxygen
- Å Dilution/Removal of Oxygen can be done:
 - ï Dilution : By use of Inert Gas CO_2
 - ï Blanketing: By use of Foam/Powder
- Å Used in Class-B(Foam/ CO_2), C(CO_2), D(Powder) Fires

FIRE EXTINGUISHER

- Å An Equipment Which Is Used At The Incipient Stage Of Fire .
- Å Why to Prefer Fire Extinguisher
 - ï It is easy to carry and operate.
 - ï It is portable and light weight.
 - ï It can operate instantly

TYPES OF FIRE EXTINGUISHER

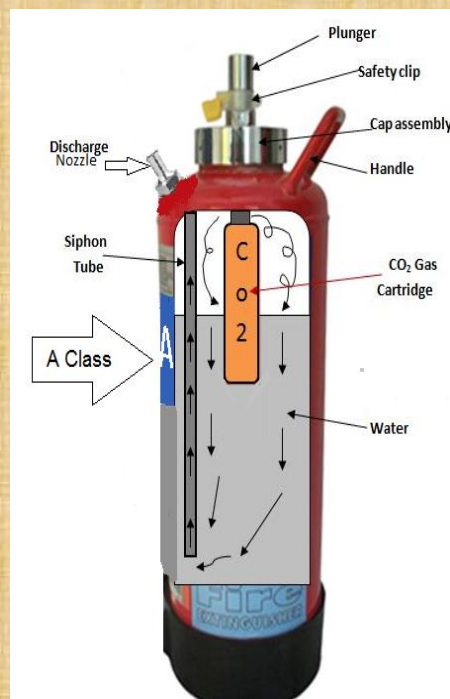
- Å Water Type.
- Å Mechanical Foam Type.
- Å Dry Chemical Powder Type.
- Å Carbon Di Oxide Type
- Å ABC Type

WATER TYPE FE

- Å Used on Class-A Fires
- Å Cooling Type method
- Å Water 1.75 gallons
(7.875 liters)
- Å Cartridge 60 g
- Å Discharge time 60 Sec.
- Å Inspection once in 3 months



WATER TYPE FE INTERNAL

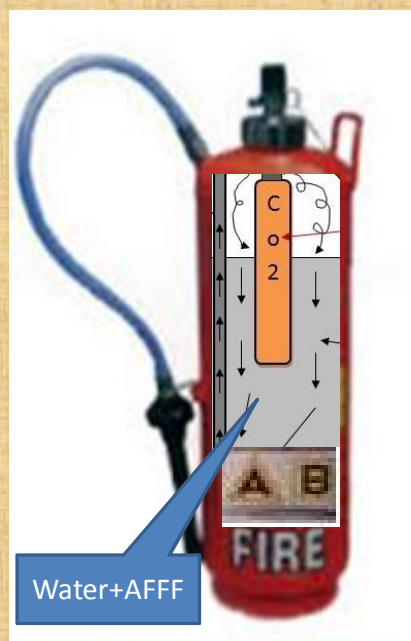


FOAM TYPE FE

- Å Used on Class-A ,B Fires
- Å Blanketing type method



INTERNAL DIAGRAM FOAM TYPE FE



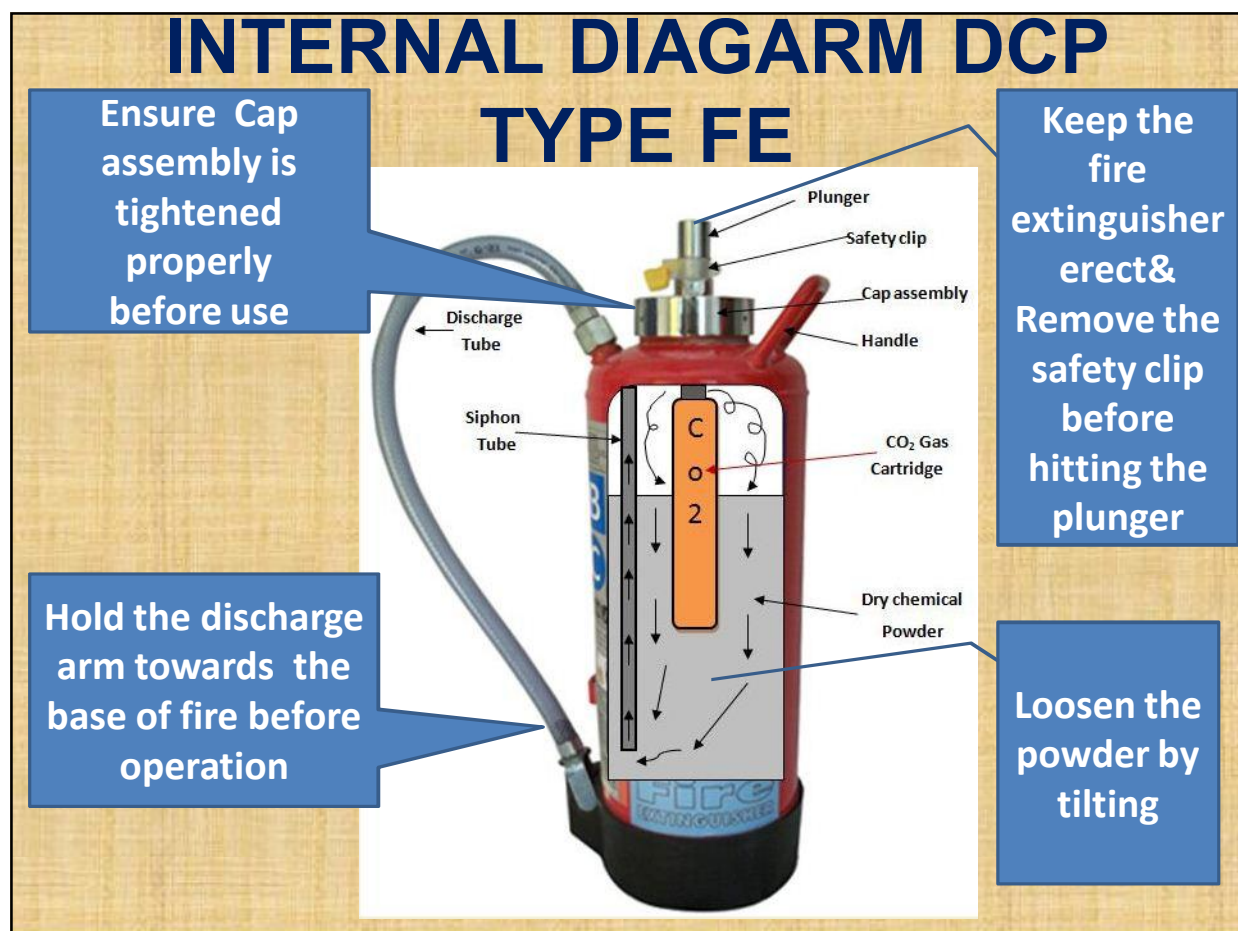
FOAM TYPE FE

- Å Used on Class-A & B Fires
- Å Smothering/Blanketting Type method
- Å Water 1.75 gallons (7.875 liters)
- Å Aqueous film forming Foam
AFFF- 550 ml to be added
- Å Cartridge 60 g
- Å Discharge time Discharge time 90-120
Seconds.

DCP TYPE FE

- Å Used on Class-B,C,D Fires
- Å Blanketing type method
- Å Sodium Bi-Carbonate- 5Kg
- Å Cartridge 120 g
- Å Discharge time 90-120 Seconds.
- Å To be refilled when the weight is reduced by 10%





CO2 TYPE FE

- ⌘ **Used on Class-B,C & Electrical Fires**
- ⌘ **Dilution type method**
- ⌘ **Used to protect electrical installations and costly electronic hardware**
- ⌘ **Will not damage the equipment**



ABC Stored Pressure Type FE

- ⌘ **Used On Class-A,B,C&D Fires**
- ⌘ **Blanketing Type Method**
- ⌘ **Siliconized Mono Ammonium Phosphate Dry Chemical**
- ⌘ **Dry Nitrogen Is Used As Expelling Agent**
- ⌘ **Chemically Insulates Class A Fires**
- ⌘ **Smoothers & Breaks The Chain Reaction Of Class-B Fires**
- ⌘ **Will not conduct electricity back to the operator**
- ⌘ **King of all Fire extinguishers**



CHOOSE RIGHT TYPE OF FE

CHOOSE THE RIGHT FIRE EXTINGUISHER				Alert			
TYPES OF FIRE EXTINGUISHER	Principal extinguishant	Extinguishing effect	METHOD OF OPERATION	EFFECTIVENESS ON DIFFERENT CLASSES OF FIRES			
				A	B	C	D
WATER CO ₂	Water	Cooling		YES	NO	NO	NO
FOAM	Foam	Blanketing		NO	YES	NO	NO
DRY CHEMICAL POWDER	Dry Chemical Powder	Blanketing		NO	YES	YES	Optional YES with TEC
ABC STORED PRESSURES	ABC Powder	Blanketing		YES	YES	YES	Optional YES with TEC
CARBON DIOXIDE	Carbon Dioxide Gas	Enveloping with CO ₂ (Diluting the supply of Oxygen)		NO	YES	YES	NO

CHOOSE RIGHT TYPE OF FE

Type of fire Extinguisher	Principle of Extinguishing	Extinguishing Effect	Method of operation	A	B	C	D
Water CO2	Removal of Heat	Cooling	Water	✓	X	X	X
Mechanical Foam	Smothering	Blanketing	Foam	X	✓	X	X
Dry Chemical Powder	Smothering	Blanketing	Dry Chemical Powder	X	✓	✓	✓
ABC Stored pressure	Smothering	Blanketing	ABC Powder	✓	✓	✓	✓
Carbon Di-oxide	Smothering	Enveloping with CO ₂ (Diluting the Supply of Oxygen)	Carbon Di-oxide Gas	X	✓	✓	X

ROLE OF ON BOARD STAFF IN CASE OF FIRE ON TRAIN

(CSO Lr. No.T.389/Safety General, Dated 02.06.2017)

ON BOARD STAFF

- Å Loco Pilots, Asst. Loco Pilots, Guards
- Å Travelling Ticket Examiners
- Å Pantry Car Staff
- Å AC Attendants/Mechanics
- Å On Board House Keeping Staff
- Å Train Examiners
- Å RPF/GRP Staff
- Å Any other Rly. Staff travelling on duty or off duty

INSTANT ACTION TEAM

Å Form An Instant Action Team

Å Comprising of

- ï On board staff
- ï Doctors travelling by train
- ï Or any passengers who volunteer for rescue work

ROLE OF INSTANT ACTION TEAM

Å Don't Panic And Take Measures To Stop Train.

Å If ACP is not working in the affected coach

ï Pull chain in adjacent coach.

Å Evacuate Passengers Away From Fire, Through Vestibules.

Å Advice Them To Cover Their Nostrils With Wet Cloth.

Å Insist On Saving Their Life Rather Than Saving Their Luggage.

ROLE OF INSTANT ACTION TEAM

- Å Isolate the affected coaches from other coaches.
- Å Mechanical and electrical couplers shall be uncoupled.
- Å Extinguish fire using available fire extinguishers or suitable method/media.
- Å Try to put out the source of fire.
- Å Turn Off Electrical Appliances or Switch off the source.
- Å Report to fire control Room @ “101”.

PERSON IS ON FIRE

- Å Wrap him with an available wrap
- Å Lay him flat and smother the flames
- Å Or ask him roll on the floor
- Å He shall not be allowed to run in open air
- Å Call for assistance

INJURED PASSENGER SAFETY

- Å Build Up Confidence
- Å Render First Aid
- Å Do Not Oral Feed Water Or Food
- Å ORS Is Permitted If Treatment Is Delayed More Than 4 Hours
- Å Move The Person To Hospital As Soon As Possible

ROLE OF LOCO CREW

- Å Stop Train Immediately
- Å Arrange For Isolating The Affected Coaches
- Å Provide Anti Rolling Arrangement For Coaches
- Å Arrange Stretcher And First Aid Box
- Å Report to Section Control and Fire control
- Å Render First Aid
- Å Obtain The Help Of Volunteers To Transport Injured Passengers

ROLE OF AC COACH MAINTENANCE STAFF

- Å Isolate The Coach Electrically.
- Å Use Fire Extinguishers To Extinguish Fire.
- Å Provide necessary lighting, Wherever necessary.
- Å Render Necessary Help For Stranded Passengers.
- Å Help In Extricating Trapped Passengers/Bodies.

ROLE OF TRAIN

SUPERINTENDENT/TTE

- Å Don't Panic And Take Measures To Stop Train.
- Å Evacuate Passengers Away From Fire, Through Vestibules.
- Å After Ensuring 100% Evacuation Close Shutters To Contain The Fire.
- Å Arrange Stretcher And First Aid Box
- Å Advice Them To Cover Their Nostrils With Wet Cloth.
- Å Insist On Saving Their Life Rather Than Saving Their Luggage.

ROLE OF PANTRY CAR STAFF

- Å Inflammable Articles To Be Protected.
- Å Use Fire Extinguishers Available In Pantry To Extinguish Fire.
- Å Provide Necessary Assistance To Instant Action Team.

ROLE OF ON BOARD HOUSE KEEPING STAFF & TXR

- Å Open doors on both side of coaches.
- Å Evacuate passengers away from fire, through vestibules.
- Å After ensuring 100% evacuation close shutters to contain fire.
- Å Open Emergency Windows for Evacuation.
- Å Provide necessary assistance to Instant Action Team.

ROLE OF RPF/GRP

- Å Separate the Area by providing temporary barriers.
- Å Restrict
 - ï onlookers and spectators from affected area
 - ï to ensure smooth rescue operation.
- Å Protect Luggage till they are handed over to genuine claimants/ Railway Authorities.
- Å Respond to call for any assistance.
- Å Check and preserve evidences/Clues of fire.

THING TO REMEMBER (LOCO RUNNING STAFF)

- Å **Examine the Loco thoroughly for no oil leakages / over heating while TOC & enroute detentions**
- Å **Ensure Adequate Fire Extinguishers**
- Å **Check the Fire Extinguishers**
 - ï **Expiry Date / Inspection Date / Not Empty**
- Å **In case of Fire**
 - ï **Stop train immediately, shut down engine,**
 - ï **Switch Off All Switches(BatteryKnife Switch) & Breakers**
- Å **Do not open engine room doors if explosion door / CCPD is operated**

THINGS TO REMEMBER

- Å Try To Extinguish Fire At Intial Stage**
- Å Choose Correct Type Of Fire Extinguisher For A Particular Class Of Fire**
- Å Ensure Cap assembly is tightened properly before selecting/ using the portable fire extinguishers**
- Å Portable fire extinguishers are to be brought near to the fire before operating it**
- Å Do not allow anybody to come near the fire**
- Å Isolate The Affected Vehicle If Fire Cannot Be Extinguished & Secure Properly**

PRECAUTION BEFORE USING FIRE EXTINGUISHERS

- ⌘ Cap assembly is fully tightened and nozzle is free of obstruction**
- ⌘ Hold Discharge Arm with left hand wherever applicable**
- ⌘ Remove safety clip before hitting the plunger**
- ⌘ Keep your head and body away from cap assembly before operation**
- ⌘ Direct the extinguishing agent towards the base of fire and apply in sweep motion**

GENERAL INSTRUCTIONS

- Å Protect yourself against the heat and smoke while extinguishing fire**
- Å In case of a major fire, Inform fire brigade 101 duly mentioning your name, class of fire, detailed address with land mark etc....**
- Å Do not operate switches and electrical equipments in case of gas leakage; Instead contact electricity board for cutting off power**
- Å After evacuation during a fire do not leave the area unless authorised by fire brigade personnel after head counting**

SUMMARY

- Å Four Types Of Fire**
- Å Three Fire Fighting Techniques**
- Å Four Media to Fire Fight**
- Å Five Types of Fire Extinguishers**



Tips on Fire fighting

