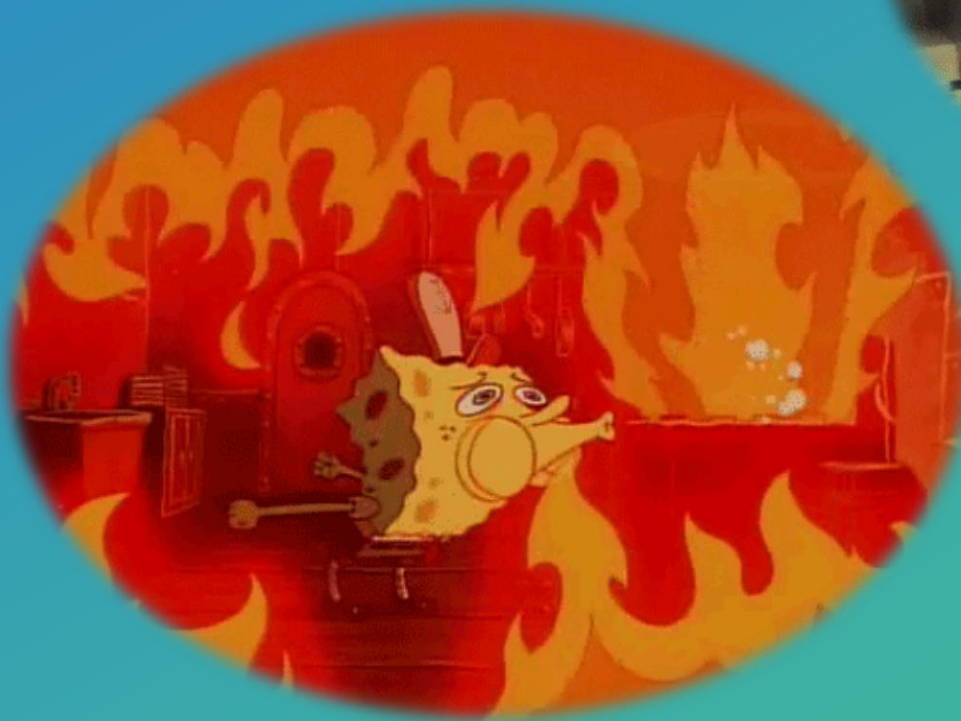


การป้องกันและการดับไฟเบื้องต้น

FIRE PREVENTION AND  
FIRE FIGHTING

+  
○



IMO. (International Maritime Organization)

STCW. (International Convention on Standards of Certification and Watch keeping for Seafarers)

เป็นหน่วยงานที่รับผิดชอบเกี่ยวกับการฝึกอบรมและออก

SOLAS (International Convention for the Safety of Life at Sea)

เป็นหน่วยงานที่รับผิดชอบเกี่ยวกับควบคุม ตรวจสอบ กำหนดให้มีเครื่องมือ-อุปกรณ์ในการป้องกันความเสียหาย สำหรับเรือเดินทะเลและผู้ที่ต้องการทำงานบนเรือ

หลักสูตรความปลอดภัยบนเรือ  
(Personal Safety and Social Responsibilities)

หลักสูตรการดำรงชีพในทะเล  
(Personal Survival Techniques)

หลักสูตรการป้องกันและการดับไฟเบื้องต้น  
(Fire Prevention and Fire Fighting)

หลักสูตรการปฐมพยาบาลเบื้องต้น  
(Elementary First Aid)

# FIRE FIGHTING AND FIRE PREVENTION



# Fire Triangle

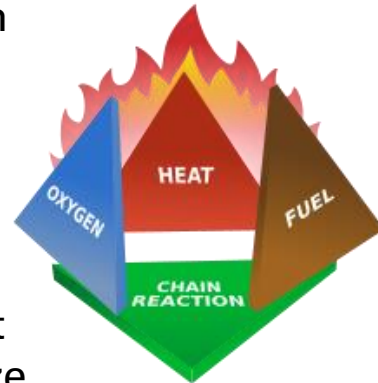
Fire is a chemical reaction which results in the production of heat, light and other by-products such as smoke and toxic fumes.



Three elements are needed to produce fire:

- ✓ Support for combustion - Oxygen
- ✓ A source of ignition – Heat
- ✓ Something that will burn – Fuel

All three elements must be present for combustion to occur, on many occasions two elements, are present and it is important for us to recognize this so that we do not introduce the third.



# What happens if oxygen levels are too low?

Oxygen Concentration %	Effects and Symptoms
20	Minimum safe entry level
16-19.5	Poor coordination, fatigue
12-16	Rapid pulse, difficulty in breathing
10-12	Very fast and deep breathing, lips begin to turn blue, headache
8-10	Fainting, unconsciousness, nausea, vomiting
6-8	Fatal in 8 minutes, 50% fatal in 6 minutes
<6	Coma in 1 minute, convulsions, respiratory and cardiac arrest, death

# Extinguishing Method.

## Extinguishing Method.

### Cooling.

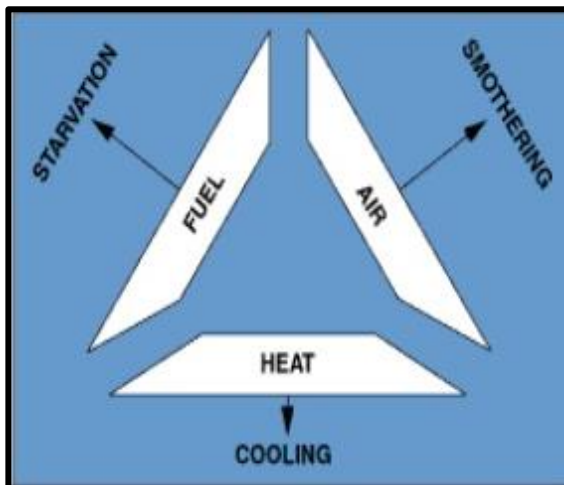
- Removing the heat energy from the fire.  
(Best cooling media is water)

### Smothering.

- Reducing % of oxygen (air).  
(Cutting off the supply of oxygen)

### Starvation.

- Removal of fuel or  
removal of combustible  
material nearby.



# Portables Fire Extinguishers.

<b>Water.</b>	Suitability - Wood, paper, textiles.
<b>Foam.</b>	Suitability - Liquid spill or contained liquid fires
<b>CO2.</b>	Suitability - Liquids and inside electrical equipment or under engines where access is difficult. It is electrically non-conductive.
<b>Dry Powder.</b>	Suitability - Ideal for low flashpoint liquids (e.g., petrol) and gases (propane, butane); as was noted before heavier oils such as cooking or lubricating oils may well be already above their auto ignition temperature (AIT) and re-ignite once the dry powder extinguisher is empty.
<b>Wet Chemical.</b>	Suitability - Designed specifically to fight fires resulting from cooking oils and fats up to 75 liters in size.
<b>Fire Blanket.</b>	Suitability - Fat pan fires, contained liquid fires. Smothering any small fire.

# CLASS OF FIRE

## Fire Extinguisher Type



Powder



Foam



CO<sup>2</sup>



Water



Wet Chemical

Fire Type		Powder	Foam	CO <sup>2</sup>	Water	Wet Chemical
<b>CLASS A</b>	<b>Solids</b> (e.g. wood, plastic, paper)	✓	✓	✗	✓	✗
<b>CLASS B</b>	<b>Flammable Liquids</b> (e.g. solvents, paint, fuels)	✓	✓	✓	✗	✗
<b>CLASS C</b>	<b>Gases</b> (e.g. butane, propane, LPG)	✓	✗	✗	✗	✗
<b>CLASS D</b>	<b>Metals</b> (e.g. lithium, magnesium)	✓	✗	✗	✗	✗
<b>ELECTRICAL</b>	<b>Equipment</b> (e.g. computers, servers, TVs)	✓	✗	✓	✗	✗
<b>CLASS F</b>	<b>Cooking Oils</b> (e.g. cooking fat, olive oil)	✗	✗	✗	✗	✓
<b>Some examples of businesses that may need this extinguisher</b>		Outdoor locations, garages, welding workshops, forecourts.	Schools, offices, hotels, shops, hospitals, apartments.	Offices, server rooms.	Schools, hospitals, shops, apartment blocks.	Kitchens, canteens, restaurants.





# Fire Alarm Control



## Heat Detector.

There are two types of heat detectors, fixed temperature and rate of rise. Fixed temperature will alarm when the set temperature is reached., Rate of rise will alarm if the temperature increases faster than a set value.



## Smoke Detector.

Most smoke detectors work either by optical detection (photoelectric) or by physical process (ionization), while others use both detection methods to increase sensitivity to smoke.



# Fire man's Outfit.

- ✓ BA SET (Self Contained Breathing Apparatus : SCBA).
- ✓ Non-conducting boot.
- ✓ Rigid helmet.
- ✓ Electric lamp.
- ✓ Axe with insulated handle.
- ✓ Safety Line.
- ✓ Two portable radios for each fire party.



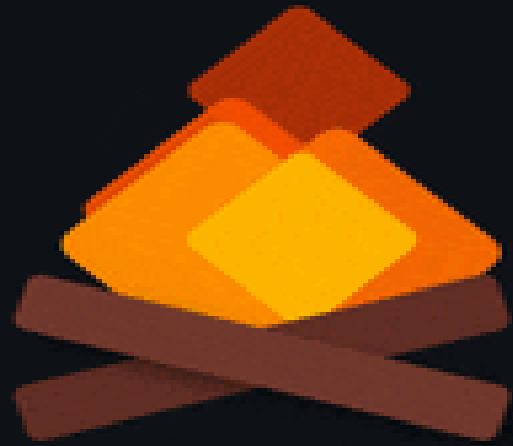


LALZAS



# EEBD : Emergency Escape Breathing Devices

- The EEBD is designed to provide a person with a short-term supply of breathable air. In emergency situations, the EEBD can save lives. Emergency Escape breathing devices are used in various industries and environments. In the maritime industry, they are used to escape from toxic or oxygen deficit in confined spaces onboard.
- EEBD's are lightweight and compact, which makes them easy to use and carry. The device is self-contained, which means they don't require a separate air supply or connection to an external source. When the air supply is about to run out, an alarm will go off to warn you.



*THANK YOU*