

TECHNICAL DRAWING

OCCUPATIONAL HEALTH & SAFETY LEARNING ACTIVITY

FIRES & ACCELERANTS

SECTION 1: FUNDAMENTALS OF TECHNICAL DRAWING 1A: OCCUPATIONAL HEALTH, SAFETY AND THE ENVIRONMENT

Objectives:

4. Fires and fire-fighting equipment

(a) Types of fires:

- a) Class A
- b) Class B
- c) Class C
- d) Class D

INSTRUCTIONAL SHEET:

FIRE:

Fire is the visible effect of a special type of chemical reaction which causes a combustion. It occurs between oxygen in the air and some sort of fuel. The fuel must be heated to what is termed as its ignition temperature for combustion to occur. The reaction will keep going as long as there is enough heat, fuel and oxygen.

ACCELERANT:

An accelerant is a substance used to aid the spread of fire.

CLASSIFICATION OF FIRES

Fires have been classified into four groups A, B, C, and D

- **Class A fires** - are fires involving flammable materials/solids
- **Class B fires** - are fires involving flammable Liquids
- **Class C fires** - are fires involving flammable Gases
- **Class D fires** - are fires involving Metals



Note: Electrical fires are not included, as they can fall into any of the above classifications. They may be caused by: faulty electrical outlets; old appliances; extension cords; conductors which can be flammable metals.

Flammable organic substances:

Definition: *Flammable solids are any materials in the solid phase of matter that can readily undergo combustion in the presence of a source of ignition under standard circumstances without changes such as pressure or density.*

Flammable solids change directly into a vapour without passing through the liquid state. That is, once ignited, the materials will melt and flow, like a flammable liquid or give off a vapour like a flammable liquid which allows the fire to continue.

Examples of flammable solids: Paper; wood; matches; candle; oily material; plastics & some textiles.

Symbol:



Flammable liquids:

Definition: *A flammable liquid is a combustible liquid which can be easily ignited in air at ambient temperatures, i.e. it has a flash point at or below nominal threshold temperatures. The flash point of flammable liquids is below 37.8°C (100°F).*

Generally speaking, flammable liquids will ignite (catch on fire) and burn easily at normal working temperatures. At normal room temperatures, flammable liquids can give off enough

vapour to form burnable mixtures with air. As a result, they can be a serious fire hazard. Flammable liquid fires burn very fast. They also give off a lot of heat and often clouds of thick, black, toxic smoke.

Some examples of flammable liquids are: *rubbing alcohol; nail polish; nail polish remover; hand sanitizer; gasoline; turpentine & paint thinners.*

Symbol for Flammable Liquids:



Flammable gases:

Definition: *Flammable gases are explosive when they are mixed with air or oxygen in the right proportions. Which mean gases having any flammable range with air at 20°C (68°F) and a standard pressure of 101.3 kPa (14.7 psi).*

Note: Aerosols are NOT classified as flammable gases.

Examples of Flammable Gases: *Propane, hydrogen, butane, methane, ethylene, acetylene, ammonia, ethane and silane.*

Symbol:



Flammable metals:

Definition: *A Class D fire is characterised by the presence of burning metals. Metal fires are a hazard when the metal is in the form of sawdust, machine shavings or other metal "fines", which combust more rapidly than larger blocks. Metal fires can be ignited by the same ignition sources that would start other common fires. Only certain metals are flammable.*

Examples of Flammable metals: *Sodium, potassium, uranium, lithium, plutonium and calcium, with the most common being caused by magnesium and titanium.*

Symbol:



BEFORE YOU TACKLE A FIRE

Many people put out small fires quite safely. However, some people die or are injured by tackling a fire which is beyond their capabilities. Here is a simple fire code to help you decide whether to put out or get out.

- Only tackle a fire in its very early stages.
- Always put your own and other people's safety first.
- Identify your exits
- Make sure you can escape if you need to and never let a fire block your exit.
- Fire extinguishers are only for fighting a fire in its very early stages.
- Never tackle a fire if it is starting to spread or has spread to other items in the room or if the room is filling with smoke. Around 70% of fire deaths are caused by people being overcome by smoke and fumes.
- Then ensure the fire brigade has been called.

Steps to follow when encountering a fire at school:

- ✓ On discovering a fire, raise the alarm by shouting FIRE!
- ✓ Identify your exits.
- ✓ Activate the nearest push-glass fire alarm call-point (small red box) close to major exits.
- ✓ Get out fast.
- ✓ Check doors for heat before opening.
- ✓ Stay low to the ground to avoid breathing smoke.
- ✓ If anything on your person catches on fire, STOP, DROP and ROLL
- ✓ Don't use elevators during a fire.
- ✓ If you can't get out, secure your room and yourself.
- ✓ Locate the fire extinguisher

REFERENCES

Wikimedia Commons – Fire symbols